REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000-2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT

AUGUST 2011

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VOLUME 2 – WATER RESOURCES GOVERNANCE

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LIST OF ABBREVIATION

AAF	Annual Average Flow
AE	Actual Evaporation
AAGR	Average Annual Growth Rate
AKSB	Air Kelantan Sdn Bhd
AN	Ammoniacal Nitrogen
ARI	Average Recurrence Interval
BAKU	Bekalan Air Kelantan Utara
BCM	Billion Cubic Metres
BKSA	Badan Kawal Selia Air Pahang /State Water Regulatory Body
BLS	Barat Laut Selangor
BOD	Biochemical Oxygen Demand
BRH	Bernam River Headworks
COD	Chemical Oxygen Demand
CAPEX	Capital Expenditure
CORPRI	Corporatization/Privatization
CNII	Critical National Information Infrastructure
COAG	Council of Australian Government
CST	Centralised Septic Tanks
DAINET	Development Alternatives Information Network
DBKL	Dewan Bandaraya Kuala Lumpur
DID	Department of Irrigation and Drainage / Jabatan Pengairan dan Saliran
DO	Dissolved Oxygen
DOA	Department of Agriculture
DOE	Department of Environment / Jabatan Alam Sekitar
DSA	Drought Sequence Analyses
DSS	Decision Support System
DVS	Department of Veterinary Services Malaysia
ECER	Eastern Corridors Economic Region
ECM	Energy Commission of Malaysia
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPU	Economic Planning Unit (Federal)
EQA	Environmental Quality Act
ESCP	Erosion and Sediment Control Plan
Eto	Evapo-transpiration

LIST OF ABBREVIATION

FAO	Food and Agriculture Organisation
FR	Forest Reserves
FT	Federal Territory / Wilayah Persekutuan
FTPP	Fair Trade Practices Policy
FTWCR	Federal Territories Water Resources Council
FTWRD	Federal Territories Water Resources Department
FWRD	Federal Water Resources Division
GDP	Gross Domestic Product
GEV	General Extreme Value
GIS	Geographical Information System
GNP	Gross National Product
GWh	Gigawatt-hour
GWh/a	Gigawatt-hours per annum
GWP	Global Water Partnership
ha	hectare
HEP	Hydro-electric Project
IADA	Integrated Agricultural Development Area
IADP	Integrated Agricultural Development Project
ICM	Integrated Catchment Management
ICZM	Integrated Coastal Zone Management
ICWE	International Conference on Water and the Environment
IFM	Integrated Flood Management
IFR	In-Flow-Requirement
ILBM	Integrated Lake Basin Management
INWQS	Interim National Water Quality Standard
IP	Intellectual Property
IPP	Independent Power Producer
IRBM	Integrated River Basin Management
IST	Individual Septic Tanks
ISRWT	Inter-State Raw Water Transfer
IUCN	International Union for the Conservation of Nature
IWK	Indah Water Konsortium Sdn Bhd
IWRM	Integrated Water Resources Management
IWRSNR	IWRS - Northern Region of Peninsular Malaysia
JAS	Jabatan Alam Sekitar / Department of Environment
JBA	Jabatan Bekalan Air / Water Supply Department

LIST OF ABBREVIATION

JICA	Japanese International Cooperation Agency
JKR	Jabatan Kerja Raya / Public Work Department
JMG	Jabatan Mineral dan Geosains / Department of Minerals and Geo-Science
JPS	Jabatan Pengairan dan Saliran / Department of Irrigation and Drainage
JPSPN	Jabatan Pengurusan Sisa Pepejal Negara
KeTTHA	Kementerian Tenaga, Teknologi Hijau Dan Air Malaysia / Ministry of Energy, Green Technology and Water Malaysia
KKM	Kementerian Kesihatan Malaysia / Ministry of Health
km	Kilometre
kW	kilowatt
KWB	Kuching Water Board
kWh	kilowatt-hour
LAP	Lembaga Air Perak
LPPP	Laporan Penyiasatan Pengeluaran Padi
l/c/d or lcd	litres/capita/day
l/w/d of lwd	litres/worker/day
LNG	Liquefied Natural Gas
LN2P	Log-normal 2- parameter
LN3P	Log-normal 3-parameter
LSAN	Lembaga Sumber Air Negeri Kedah
LUAS	Lembaga Urus Air Selangor / Selangor Water Management Authority
LUAN	Lembaga Urus Air Kedah / Kedah Water Resource Board
MADA	Muda Agricultural Development Authority
MAF	Mean Annual Flood
MAM	Mean Annual Minimum
MAR	Mean Annual Catchment Rainfall
MARDI	Malaysian Agricultural Development Institute
MC&I	Malaysian Criteria & Indicator
MCM	Million Cubic Metres
MD	Maximum Demand
ME	Multiple Effect
MHLG	Ministry of Housing and Local Government
Ml	Million Litres
Mld	Million Litres Per Day

LIST OF ABBREVIATION

MMD	Malaysian Meteorological Department / Jabatan Meteorologi Malaysia
MNC	Multinationals Company
MNMP	Malaysian National Medicine Policy
MOH	Ministry of Health
MoNRE/NRE	Ministry of Natural Resources and Environment Malaysia
MP	Malaysia Plan
MSF	Multi-stage Flash
MSMA	Manual Saliran Mesra Alam
MVA	Manufacturing Value-added
MW	Megawatt
m3/s	Cubic metres/second
NAHRIM	National Hydraulic Research Institute of Malaysia
NAM	Non-aligned Movement
NATIP	National Timber Industry Policy
NCER	Northern Corridors Economic Region
NDWQSP	National Drinking Water Quality Surveillance Programme
NERC	National Environment Research Council
NGO	Non Government Organisation
NIPP	National Intellectual Policy
NLC	National Land Council
NREO	Natural Resources and Environment Ordinance
NRW	Non Revenue Water
NWI	National Water Initiative
NWMS	National Water Market System
NWQMS	National Water Quality Management Strategy
NWRC	National Water Resources Council
NWRD	National Water Resources Department
NWRL	National Water Resources Law
NWRP	National Water Resources Policy
NWRS	National Water Resources Study
NWSC	National Water Services Commission
OIC	Organization of Islamic Conference
OPP3	Third Outline Perspective Plan
PAAB	Pengurusan Aset Air Berhad
PCC/pcc	Per capita consumption
PDMP	Power Development Master Plan

LIST OF ABBREVIATION

PE	Population Equivalent
PFR	Permanent Reserved Forests
PGMS	Pacific Garbage Management Systems
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
PPA	Power Purchase Agreement
PSMP	Power Systems Development Master Plan
PTG	Pejabat Tanah dan Galian / Land and Mines Department
PWD	Public Works Department / Jabatan Kerja Raya
RBC	Rotating Biological Contractor
RC	Reinforced Concrete
RDC	Regional Development Corridor
RDZ	Regional Demand Zone
RO	Reverse Osmosis
SAINS	Syarikat Air Negeri Sembilan Sdn Bhd
SAIP	Sabah Agro-Industrial Precinct
SALCRA	Sarawak Land Consolidation and Rehabilitation Authority
SAMB	Syarikat Air Melaka Berhad
SAP	Sabah Agricultural Policy
SBCP	Sapangar Bay Container Port
SCORE	Sarawak Corridors of Renewable Energy
SDC	Sabah Development Corridor
SESB	Sabah Electricity Sdn Bhd
SESCO	Sarawak Electricity Supply Company
SEB	Sarawak Energy Berhad
SFMLA	Sustainable Forest Management License Agreement
SFZ	Sapangar Free Zone
SITExT	Sandakan Integrated Trade Exchange Terminal
SMI	Small And Medium Industry
SPAN	Suruhanjaya Perkhidmatan Air Negara / National Water Services Commission
SSMP	Sabah Shoreline Management Plan
STIDC	Sarawak Timber Industry Development Corporation
STP	Sewage Treatment Plant
SWB	Sibu Water Board
SWR	State Water Resources
SWRA	State Water Resources Agency
SWRC	State Water Resources Council
SWRD	State Water Resources Department

LIST OF ABBREVIATION

SWRTC	State Water Resources Technical Committee
SYABAS	Syarikat Bekalan Air Selangor Sdn Bhd
TCM	Total Catchment Management
TEM	Transient electromagnetic
TNB	Tenaga Nasional Berhad
Tonnes/ha	Metric tons per hectare
TOR	Terms of Reference
TSS	Total Suspended Solids
UNDP	United Nations Development Programme
UPEN	Unit Perancang Ekonomi Negeri / State Economic Planning Unit
URS	Conduct a User Requirements Study
VC	Vapour Compression
WAMCO	Water Asset Management Company
WDM	Water Demand Management
WF	Water for the Future
WHO	World Health Organization
WP	Wilayah Persekutuan / Federal Territory
WQI	Water Quality Index
WQIP	Water Quality Improvement Plan
WRP	Water Resources Plans
WRDMC	Water Resources Development and Management Corporation
WSIA	Water Services Industry Act 2006
WTP	Water Treatment Plant
WWC	World Water Council

SECTION 1

WATER RESOURCES GOVERNANCE

Section 1 WATER RESOURCES GOVERNANCE

1.0 THE CASE FOR WATER RESOURCES GOVERNANCE

Volume 2 of the Final Report for the *Review of the National Water Resource Study (2000-2050) and Formulation of National Water Resources Policy* provides an analysis of water resources governance. In the context of this Study, water resources governance refers to the administrative structure, policy regime and legal framework necessary to manage water as a resource. Consequently, this Study describes the rationale behind the need to develop a logical and workable framework for enhanced water resource governance in this country.

Section 1 introduces the past and present situations of water resource management in Malaysia. This is followed by recommendations for the future direction to be taken for water resources management. By doing so, this Study presents the working drafts for:

(a) A National Water Resources Policy;
(b) A National Water Resources Law; and
(c) Recommendations for reforms in the institutional arrangements following from the draft NWR Policy and Law.

The above is achieved by placing the deliverables within the context of Integrated Water Resources Management (IWRM) – the focus being on the concept of integrated management for water resource security and sustainability.

At the conclusion of Section 1, the follow-up on Section 2 will describe in detail the proposed draft National Water Resources Policy (NWR Policy). This is followed by Section 3, which outlines a draft National Water Resources Law (NWR Law) along with detailed analysis of the need for such a mechanism. This Volume concludes in Section 4 with a review of the institutional arrangements currently in place, and an analysis of international practices, leading to the culmination of an effective institutional capacity and arrangement to achieve secure and sustainable water resource management in the country.

1.1 OVERVIEW OF WATER RESOURCES

The total surface runoff in Malaysia is estimated to be 494 billion cubic meters/year (or 1,500 mm/year) from an average rainfall of 2,940 mm/year received in the country. The amount of rainfall is unevenly distributed with some States having more water from rain while other States have water-deficits (see **Table 1.1**).

The determination of what constitutes a water resource is principally an internal matter to be determined at a national level, although its definition should not preclude benefits from the internationally accepted meaning given to the phrase '*water resources*' **(see Figure 1.4).**

Water manifests itself in a variety of forms in the hydrological cycle (see **Figure 1.1**). At any given moment, water is distributed as surface water, groundwater and water in the

atmosphere. It is possible that water from all three locations can be tapped for use. The visible surface water being most easily accessed is more economical to source, and is therefore becoming over-exploited. Surface water also serves as a convenient recipient for the return of used water, which takes a heavy toll on the quality of water resources. Therefore, the over-exploitation of surface water and its contamination by wastewater discharges have put this option for water abstraction in dire stress in many locations.

The Study identified four main categories of water for adoption as water resources in the Malaysian context, to be brought under the umbrella of water resources management; these being:

- Surface water;
- Groundwater;
- Coastal waters (up to three nautical miles of the Malaysian coastline); and
- Atmospheric water.

(i) Surface Water Resources

Surface water resources are contained in water bodies such as rivers, streams, lakes, wetlands, discarded mining ponds and reservoirs. These can be natural or man-made water bodies. Usually surface water resources are predominately made up of freshwater (as opposed to saline water); or if it is near to the coast, the water is brackish. Surface water in rivers is generally in a lotic state, that is, it is in constant motion compared to water in lakes and ponds, which is essentially lentic or stationary. Management and care of the two conditions will require different approaches. Any pollutants introduced into lakes will stay and accumulate at the bottom of the lake, whilst those dumped in rivers move on and sometimes are even broken down by the cleansing actions of flowing waters.

Table 1.1 – Water Resources in Malaysia

State	Rainfall	Actual Evaporation	Ground Water Recharge	Surface Runoff	Rainfall	Actual Evaporation	Ground Water Recharge	Surface Runoff
	mm/year				BCM/year			
Perlis	1,880	1,290	120	470	1.54	1.06	0.1	0.38
Kedah	2,310	1,430	130	750	21.95	13.59	1.24	7.12
Pulau Pinang	2,350	1,430	120	800	2.46	1.50	0.13	0.83
Perak	2,420	1,320	170	930	52.17	27.77	3.58	20.82
Selangor	2,190	1,280	150	760	18.39	10.44	1.26	6.38
Negeri Sembilan	1,830	1,210	130	490	12.24	8.09	0.87	3.28
Melaka	1,880	1,210	100	570	3.13	2.01	0.17	0.95
Johor	2,470	1,130	200	1,140	47.45	21.71	3.84	21.9
Pahang	2,470	1,250	120	1,100	89.26	45.17	4.34	39.75
Terengganu	3,310	1,470	150	1,690	43.15	19.16	1.96	22.03
Kelantan	2,600	1,290	140	1,170	39.26	19.48	2.11	17.67
West Malaysia	**2,495.5**	**1,283.8**	**147.6**	**1,060.0**	**330.98**	**170.28**	**19.56**	**141.11**
Sabah	2,560	1,190	190	1,180	188.5	87.62	13.99	86.89
Sarawak	3,640	1,250	240	2,150	453	155.56	29.87	267.57
FT Labuan	3,100	1,480	150	1,470	0.28	0.13	0.01	0.14
East	**3,238.5**	**1,227.8**	**221.4**	**1,789.3**	**641.78**	**243.31**	**43.87**	**354.60**
Malaysia	**2,940.6**	**1,250.3**	**191.8**	**1,498.5**	**972.78**	**413.60**	**63.45**	**495.71**

(ii) Groundwater Resources

Groundwater resources are located either in confined or unconfined aquifers. However, the extent of groundwater resources in Malaysia has not been mapped in detail as yet. What appears to be known is that:

(a) The storage potential for groundwater is enormous standing at approximately 5,000 billion cubic meters, or 15,152 mm/year; and

(b) The estimated annual groundwater recharge is about 63 billion cubic meters/year, or 190 mm/year, (refer **Table 1.1**).

Whilst the extent of groundwater reserve in the country may appear large, the abstraction and use of groundwater will require careful planning and management to prevent over-abstraction that could cause harm to the environment and the resource. Nevertheless, groundwater has great potential for beneficial use, the scope of which will need to be fully understood and harnessed through further ongoing research.

(iii) Coastal Waters

The suggestion to include this category into the definition of water resources is qualified to a limit of three nautical miles beyond the Malaysian coastline. This territory is under the jurisdiction of the State (the Federal Government has jurisdiction from 3 nautical miles onwards to 12 nautical miles). It has been argued that care of it from a water perspective should be a water resource management matter. The potential to meet abstractive-based water demand from this resource is, however, quite limited at the moment and possibly in the foreseeable future, because of the salinity content. Presently, desalinising the water for various uses would render such a move financially prohibitive and untenable, compared to other options for securing freshwater.

Regardless of the above, there are reasons for vigilance in this area. A case in point would be the construction of jetties, groins and other structures in the coastal areas. These can affect the littoral movement of currents along the coast and cause serious problems to property owners along the seafront through the actions of coastline erosion and accretion, the latter of which is not always beneficial. Additionally, the indiscriminate discharge of effluents into this coastal area by industries along the coast takes a toll on the potential of these waters for tourism, recreation, aquaculture and seafood harvesting.

(iv) Water in the Atmosphere

A recently developing avenue for sourcing water is moisture in the atmosphere. However, available technology to develop and manage water resources from this potential is not thought viable yet. In the past, the country has engaged in cloud seeding operations to produce rainfall in drought-stricken areas. However, the success rate of these efforts has not been clearly established. Until atmospheric and meteorological sciences can provide accurate prediction of the effects from cloud seeding, this technology should be used with caution. Future research in cloud seeding sciences should continue in order that a technological option is available for drought and flood mitigation in the future.

As technology for the above applications advances, a central government agency should be responsible for managing the cloud seeding service providers who would likely be from the private sector. They would need to be monitored and guided carefully with rules, criteria, and standards that have been scientifically developed to ensure the services given are people and environment-friendly. This sector must be most definitely only be allowed to operate through licensing on a case by case basis. Additionally, from a local and international legal perspective, cross-border aspects would also need to be assessed, particularly whether there are any legal rights or obligations in the deployment of cloud seeding technology, where atmospheric waters do not recognize administrative, territorial and physical boundaries.

All aspects of the above are important to water resources management and need to be investigated via a comprehensive program of work. Quite apart from the usual water source, are those sources available through other avenues, i.e., from grey water, from rainwater harvesting and from recycled wastewater. In order for these other water sources to be used, there is a need for a system to be initiated and appropriately empowered to explore the integrated exploitation of the nation's water resources (natural or otherwise) in a balanced manner without hurting the environment, and without unnecessarily burdening legitimate water users. This requires that all sources of water are identified, and mapped in terms of quantity, distribution, and quality, and from this database of information, an orderly system of allocation and regulation be implemented to equitably meet the demands of all legitimate users. What becomes apparent from this discourse is that, without sustainable and integrated management, safe and cost-effective water resources will become increasingly scarce as the resources become more degraded. Simply put, the country's clean water resources are being diminished.

Importantly, this overview exercise observes that:

(i) There are in this country several sources of water;
(ii) Some of the sources have been over-exploited and abused and therefore are now in a state of decline and/or degradation; and
(iii) Other sources of water appear to have been left under-utilised or ignored.

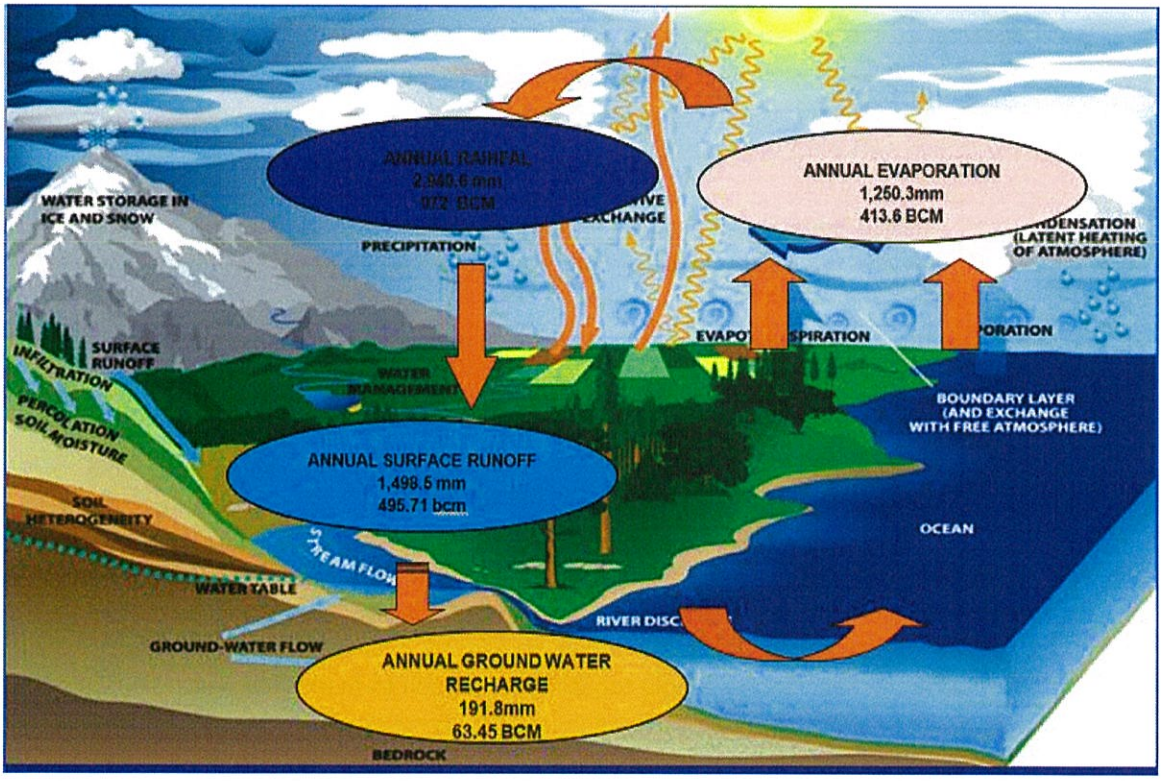


Figure 1.1 - The Hydrological Cycle [1]

1 Water resources figures shown refer to situation in Malaysia

1.2 COMPETING DEMANDS FOR WATER

There is a notion that water is finite because the hydrological cycle on average yields only a fixed quantity of water per time-period. This overall quantity cannot yet be altered significantly but it can be frequently depleted by water pollution and over-abstraction. Hence, water resources need to be managed carefully in a co-ordinated manner to ensure the desired services it provides are sustained in order to enable equitable distribution and access for all beneficial users.

Apart from sustaining the environment as stated earlier, water is necessary and used for all anthropogenic activities such as:

(i) potable supply to meet domestic and industrial demand;
(ii) food production, mainly in terms of irrigation demand;
(iii) providing the medium for water-borne transportation;
(iv) power generation in the operation of hydropower plants, and in the cooling of other power plants;
(v) enhancing and promoting recreation and tourism; and
(vi) receiving of stormwater and for dilution of effluent wastes.

The first two in the above list often require most of the water used and are frequently in stiff competition with one another for what is sometimes a limited water resource. The importance and therefore the priority to be given to one or the other, or both, depend very much on the location and the principal economic activities engaged within the area. **Figure 1.2** and **Figure 1.3** provide an indication of the variability by the two demand[(2)] sectors among States for the years 2010 and 2050 for comparative purposes respectively. The primary observations from these two sets of data are that:

(i) some States have greater demand for irrigation water, whilst others for potable water; and in few cases, both demand sectors are almost equal;

(ii) the character of this demand profile is dynamic and it can be reversed over time; and

(iii) the respective water demand generally tends to increase over time; however, in very few cases the demand by each sector can remain static, but almost never do they reduce (at least significantly so) over time.

The above is a challenge facing water custodians in their duty to conserve and distribute water. This cannot be left to its own device to be sorted out, especially, when equitability and security of supply to legitimate users should be a State-given guarantee to all citizenry. Furthermore, resorting to a rigid top-down approach to manage water resource problems will not result in adequate outcomes, as in most such cases, this approach could possibly lead to failure and/or unfulfilled responsibilities.

2 State water demand (mm) = State water demand (mm^3)/State area (mm^2)

Therefore, water resources management needs flexibility of approach, allowance for adaptation to on-the-ground conditions, consultation with (and even participation of) stakeholders in addition to the usual regulation and enforcement that at one time was considered the extent of the entire approach to be taken.

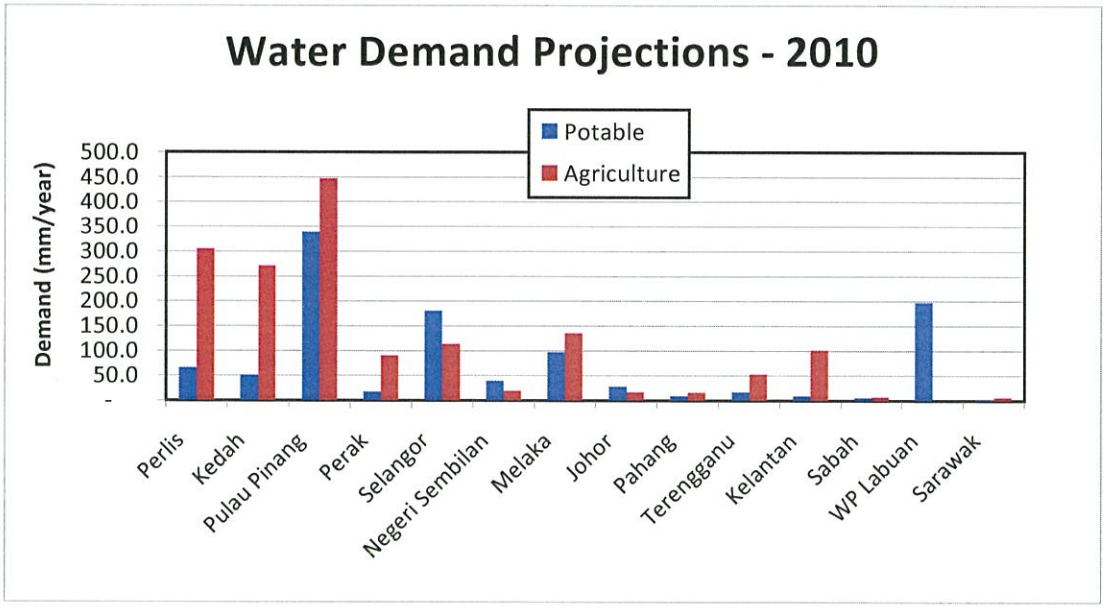


Figure 1.2 - Potable and Agriculture Water Demand by States in 2010

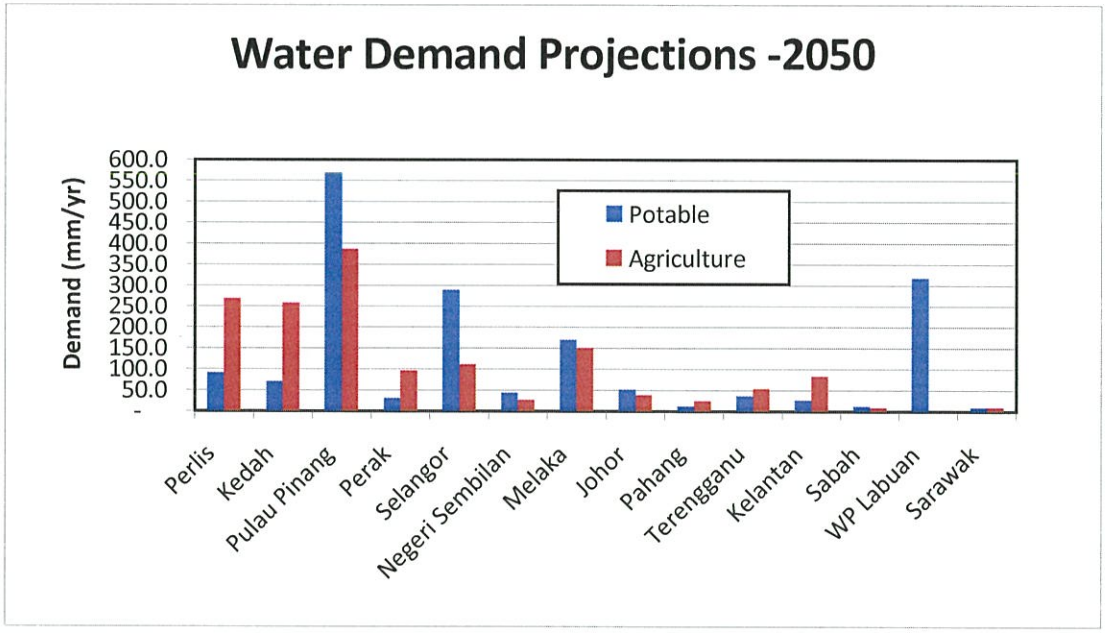


Figure 1.3 - Potable and Agriculture Water Demand by States in 2050

1.3 FACTORS AFFECTING WATER RESOURCES

Care of water resources involves reaching beyond the water boundary as human activities in almost all areas have an effect on water resources. More often than not, these impacts are routinely negative and are usually manifested in terms of poor water quality or the inadequate distribution of water in an area. As an example, an altered state of landuse, from the implementation of land schemes, can cause changes to the hydrology of the area to an extent that water excesses and shortages of that area become further amplified. Additionally, the implementation of such land schemes on hill slopes facilitates soil erosion, causing extensive damage to water bodies and surface water resources by sedimentation and silt pollution. Other examples of concern from anthropogenic activities on land involve the use of fertilisers and pesticides in agriculture, the discharge of effluent and emission of pollutants from factories, the disposal of sewage and sullage from settlements, and many more human-related activities. Neglecting to manage any of these concerns is an inadequate response to these anthropogenic effects, and can have dire consequences on our efforts of conservation and sustainability of water resources. Inevitably, neglect will lead to costly and time-consuming rehabilitation measures to undo and restore degraded water resources.

As a result, effective water management must not confine itself to just looking at water alone, it also requires consideration of and involvement in landuse matters. A comprehensive approach to water resources management in the country is impossible without having a linkage to authorities dealing with land, forests, minerals and other such related resource or activity sectors. This issue becomes an inherent requirement to achieve integrated sustainable water resources management. In this context, the following sub-sections introduce the subject of governance (much further expanded upon in Sections 2, 3, and 4 of this Volume), explaining what it is, and how it can be enhanced.

1.4 THE MEANING OF WATER GOVERNANCE

The meaning and scope of water governance have been debated in many forums to provide a clear meaning of what it covers and what it should involve. One of the most influential forum, the Global Water Partnership has defined water governance[3] as:

"...the range of political, social, economic, and administrative systems that [are] in place to develop and manage water resources, and the delivery of the services, at different levels of society"

It is quite evident from the above definition that there are three main features within the concept of water governance, that is:

(i) First, governance shall include involvement from a range of systems, i.e. political, social, economic, and administrative. This means that each system in the chain (whether in government, the private sector, or in civil society) would have to be

3 Rogers, Peter and Hall, Alan. *Effective Water Governance - TEC Background Paper No 7.* s.l. : Global Water Partnership Technical Committee, 2003.

identified, properly prepared and appropriately empowered for the task ahead. They shall constitute the participating stakeholders.

(ii) Second, the deed or act of governance as having to carry out two responsibilities, i.e. (a) developing and (b) managing the resource. This clearly implies that the act of governance goes beyond allocation and regulation of the resource, and that it shall also include the other and very important task of looking after the conservation and sustainability aspects of the resource.

(iii) Third, the coverage of the governance action can be separated into two, i.e. (a) the development and management aspects of water resources *per se*, and (b) the development and management of the water delivery services. It is to be noted that (b) could be attended to collectively, in groupings, individually, or in a combination of the last two.

1.5 BLUEPRINTS FOR WATER GOVERNANCE FROM WORLD BODIES

Many water governance programs worldwide are rooted within the Dublin Principles arising from the Dublin Conference of 1992. Since then, several international goals have been set to aid governments in their approach to water governance. These are elaborated in the ensuing paragraphs.

At the 2000 World Water Forum in Hague, the Global Water Partnership (GWP) Framework for action proclaimed that, *"the water crisis is often a crisis of governance"* and singled out "*making governance effective"* as requiring the highest of priorities from governments. This was reviewed and further reinforced at the Hague in 2000, when the Ministerial Declaration called for *"governing water wisely to ensure good governance, so that the involvement of the public and the interest of all stakeholders are included in the management of water resources".*

Later at Bonn in 2001, the ministers at the Freshwater Conference, recommended that, *"each country should have in place applicable arrangements for the governance of water affairs at all levels and, where appropriate, accelerate water sector reforms".* The UN 2000 Millennium Assembly called for a *"stop to the unsustainable exploitation of water resources, by developing water management strategies at regional, national, and local levels, which promote both equitable access and adequate supplies".* This was endorsed at the World Summit on Sustainable Development in Johannesburg in 2002 where attending Heads of State agreed to a specific target, i.e. *"to prepare IWRM and water efficiency plans by 2005".* But, it was also qualified then that if these plans are to be meaningful, they need *"to take cognizance of prevailing governance systems and allow for necessary reforms".*

Clearly, the message for the international community from the highest of international levels is a compelling plea for national commitment to implement effective governance of water, using the argument that:

(i) *effective water governance is fundamental* if the water crisis is to be averted;

(ii) governments should *give making water governance effective the highest of priorities*;

(iii) to be effective, *water governance should involve (a) the public and (b) the interest of all stakeholders,* in the management of water resources;

(iv) each government should consequently *place arrangements for governance of water affairs at all levels and engage, as a matter of urgency, in water sector reforms*;

(v) a global effort to *stop the unsustainable exploitation of water resources* is necessary;

(vi) towards this objectives, governments have to *develop water management strategies for regional, national, and local levels* which promote equitable access and adequate supply of water, for all times; and

(vii) the way forward is to *implement IWRM and draw up water efficiency plans.*

The above, should be construed as Malaysia's international obligations and affirmation of related rights on water governance to the world community.

1.6 THE INTEGRATED WATER RESOURCES MANAGEMENT CONCEPT

Following from the above, the interpretations (in brackets and in *italics*) of the Integrated Water Resources Management (IWRM) concept founded on the four Dublin Principles are:

- Freshwater is a finite, vulnerable and an essential resource which should be managed in an integrated manner (*that is, it needs a holistic approach in terms of management of natural systems as well as institutional approach; coordinated and planned water use; and should consider upstream-downstream user relations*);

- Water resources development and management should be based on a participatory approach involving all relevant stakeholders (*includes all levels of government, the public and NGOs*);

- Women play a central role in the provision, management and safeguarding of water (*Women's involvement in decision-making, women as water users, IWRM requires gender awareness*); and

- Water has an economic value and should be recognised as an economic good, taking into account affordability and equity criteria (*value and charges, useful water value and cost concepts, full cost recovery – water is scarce, fugitive, a system, bulky, irreplaceable and complex*).

The GWP defines IWRM as:

"a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an

equitable manner without compromising the sustainability of vital ecosystems" (GWP, TAC 4).

Integrated Water Resources Management (IWRM) is therefore a process, which deals with re-allocating water, allocation of financial resources, and implementation of environmental goals. The IWRM principle disassociates itself from traditional fragmented and sectorally-slanted approaches towards water management. It instead, features the integration of the three "E's" that is, environmental sustainability, equity, and economic efficiency into a holistic management process through the deployment of management instruments (basically to have in place, a policy and legislation) to create an enabling environment in which institutions can be set up and empowered to perform the task of water resources management.

IWRM also makes a clear distinction between water resource management and water service delivery functions (**Figure 1.5**). The broad concept is demonstrated in **Figure 1.5** and elaborated below:

- Promoting the co-ordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

- Moving towards an *enabling environment* of appropriate policies, strategies and legislation for sustainable water resources development and management;

- Putting in place the *institutional structure* framework of stakeholders through which the policies, strategies and legislation can be implemented ; and

- Setting up the *management instruments* required by these institutions and stakeholders to do their job to achieve IWRM.

It is clear that IWRM cannot be applied in a vacuum. It is a process that is introduced into an existing set-up of water governance for the purpose of improving upon it. IWRM therefore provides policy-makers and practitioners with a range of tools to face and overcome governance challenges (see **Table 1.2** for samples in the GWP list of tools). There are in the GWP list of 2001, more than fifty tools that can be used by practitioners. Different States in the country however will need to identify which management tools or instruments are most beneficial and appropriate to use, given their specific circumstances.

It is important to take cognizance of the fact that in general, the world and local water community is in agreement that IWRM provides a very viable way forward for sustainable water use and management. This is chiefly supported by the fact that it provides a framework for integrated cooperation and adaptation to changing circumstances, among other benefits.

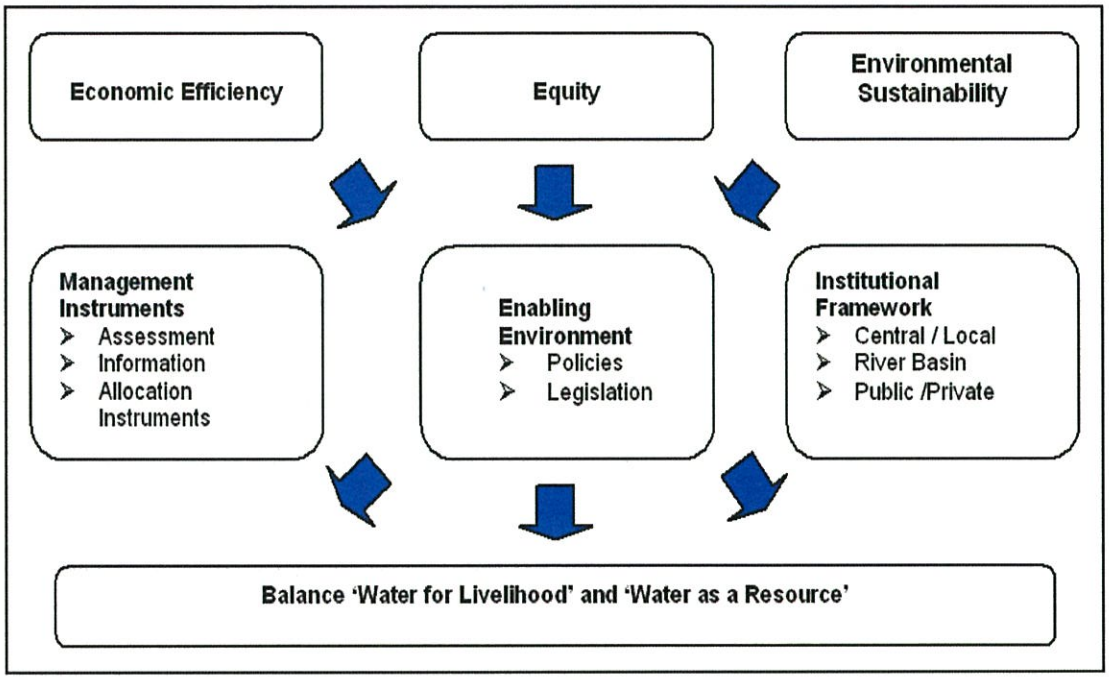


Figure 1.5 - The IWRM Concept for Balanced Water Resources Management [4]

Table 1.2 - IWRM Tools Addressing Governance Failures[5]

Governance failures/challenges	IWRM tools for remedy
• The lack of effective knowledge of the resource, the demands imposed on it and the current uses that are made of it	• Water resource assessment plans for IWRM
• Ill defined property rights, unclear ownership • Absence of or inappropriate legislation • Unclear ownership of property rights	• Legislation • Water rights
• Ignorance and uncertainty about markets, droughts, floods, etc, leading to inability to set prices correctly	• Water resource assessment, risk assessment and management
• The inability of government to control and regulate the sustainable use of water • The non-payment of services linked to water • Bureaucratic obstacles or inertia • Lack of an overall responsible authority	• Institutional roles • Social change instruments
• Over-regulation or under-regulation • Conflicting regulatory regimes • No independence and impartiality of the	• Regulatory instrument • Institutional capacity building

4 Shahrizaila, Abdullah. *IWRM and Groundwater Management – Workshop on "Role of Groundwater in the Management of Water Resources and Governance Issues in Groundwater"*, 2010.

5 Rogers, Peter and Hall, Alan. *Effective Water Governance - TEC Background Paper No 7.* s.l. : Global Water Partnership Technical Committee, 2003.

Governance failures/challenges	IWRM tools for remedy
organisms of regulation • Provision of water services are natural monopolies • Imprecise reflection of consumer preferences systems • Short-sightedness • Voter ignorance and imperfect information • Special interest effects, including political weaknesses and vested interests • Little entrepreneurial incentives for internal efficiency	• Information management • Water campaigns and awareness raising • Role of the private sector

1.7 MALAYSIAN SCENE: ENHANCED WATER GOVERNANCE IN MANAGEMENT [6]

1.7.1 The Water Resource Scenario

One might perceive that Malaysia's need for institutionalised water governance may not be as pressing as in the case of some other nations in less favourable locations. After all the country is located in the tropics and enjoys an equatorial climate with abundant rainfall, that averages 2,940 mm per year. Furthermore, 51% of this precipitation or 1,500 mm/year manifests as surface runoff that can be readily tapped. The extent of surface water is huge compared to the country's annual water demand of 40 mm/year now and 82 mm/year as projected to increase by the year 2050. Nevertheless, water-related issues do arise that require attention, as is explained in the ensuing sub-sections.

1.7.2 Water Excess and Shortage

About 60% of the annual rainfall comes in the months of November to January, i.e. in three months of a twelve-month period. Furthermore, the rainfall is unevenly distributed nation-wide, hitting more the unprotected east coast of Peninsular Malaysia, and specifically during periods within the northeast monsoon, i.e. from November to March. This has led many riverine areas and flat terrain regions along the coast having to experience widespread flooding. Other areas not spared similar problems are the heavily populated and densely developed urban centres found all over the country. In almost all of these areas, there are locations within them that are subject to flash floods because of inadequate drainage and poorly implemented catchment management practices. It is estimated that some nine to ten percent of the country is flood-prone, requiring Government expenditure for flood-relief, flood-rehabilitation and flood-mitigation works, which have risen significantly in the last two decades.

The seasonal distribution and variation of rainfall, both temporal and spatial, have also rendered several regions in the country having to face water-stress related problems. This

6 Rogers, Peter and Hall, Alan. Shahrizaila, Abdullah. *IWRM and Groundwater Management - Workshop "Role of Groundwater in the Management of Water Resources and Governance Issues in Groundwater..".* 2010.

state of affairs is particularly severe in the smaller States and those that have been more extensively deforested. The situation of Melaka, Perlis, and Pulau Pinang are examples of the foregoing. At the same time, States supporting large-scale agriculture like the 'granary areas' for paddy production in Perlis, Kedah, and Selangor and those that are heavily industrialised as in the case of Pulau Pinang, Selangor, and the Federal Territories of Kuala Lumpur are known to experience problems of productivity loss when extended periods of droughts cause water supply to fall short of water demand needs. Engaging solely in demand management may not necessarily be a solution in many of the above situations, where a beneficial case may exist for water transfer from the 'have' to the 'have not' regions. Such projects are complex in nature needing careful handling to ensure that the gain of one party does not end as a loss to the other. A governance mechanism where all parties have representation is extremely essential in these situations.

1.7.3 Water Pollution

Water pollution depletes the amount of usable water. Fortunately, most Malaysian rivers at their headwaters are still in pristine condition with good water quality. However, further downstream, water quality is impaired as the rivers and waterways are exposed to point and non-point sources of pollution along its path to the sea. The principal causes of pollution are: (i) the dumping of domestic waste, industrial effluent, and factory discharges; and (ii) the release of silt from mining, logging and land development schemes. A recent estimate of the amount of wastes resulting from activities in the Klang Valley, that is dumped into the river system as amounting to a staggering 60 tonnes per day. Another study conducted on some 90 selected lakes and reservoirs found that about 62% of them are 'eutropic', primarily from nitrate and phosphate originating from fertiliser and pesticide use in agriculture. Water resource management in these instances clearly needs to reach out beyond the water boundaries (discussed in Section 1.3 above) by having involvement in land, forests and the environment.

1.7.4 Threats from Climate Change

Much concern has been raised in recent times about global warming as a result of increased greenhouse gas releases into the atmosphere. International scientific discourse now recognises that global warming leads to extreme climatic variability and unpredictability as witnessed in recent decades. Science predicts that future climatic conditions will be more severe in future, leading to extremes such as sea level rise, and more frequent flooding and drought situations.

In the context of future climate change, there is also the potential for extreme events that may displace large populations leading to climate-change-refugees seeking a new home in foreign countries. Some commentators predict that this could lead to serious geo-political challenges, and in the context of water resource management, further stress on water resources for Malaysia if it becomes home to a large influx of climate-change-refugees.

Along with the above is also the threat from tsunamis to consider and be prepared for. This was brought to the awareness of every nation in the world by the December 2004 tsunami that originated from Indonesia but caused untold grief, loss of life and property damages in numerous countries. In the case of Malaysia, the northern coastal areas of Kedah and Pulau Pinang were affected although not as seriously as the riparian countries around the Indian Ocean.

The above are two emerging challenges of the 21-century that face leaders of all countries. Planning for safety from both challenges is a national responsibility. It is principally a matter of water resources governance that requires the activation of a well-led capable and coordinated team working on it. Team members should come from selected government and private sector agencies at both Federal and State levels.

1.7.5 State of Current Water Management

The use of management tools in the affairs of water is not a new concept in this country. The country has policies related to water services, laws on and about water use, and institutions set up at the Federal and State levels for stewardship over water for its many uses by the population and for the environment. However, the main challenge is to create an enabling environment for integrated sustainable water resources management to take root. This is because:

- existing policies are spread between the functions of a number of Ministries (see **Table 1.3** and also Section 2 on draft NWR Policy);
- current laws are either out-dated or were developed sectorally for specific application in selected fields of water governance (see also Section 3 on Legislative Framework for IWRM); and
- the set-up of Federal and State institutions, though functioning well enough, work more or less in exclusion of one-another, as they pursue the localised objectives of their respective organisations.

There is no single formally constituted entity that is presently empowered to plan, coordinate, and execute IWRM on behalf of the nation. The National Water Resources Council (NWRC), whilst constituting a good coordinating body for water affairs, has not been provided with the necessary legal mandate for carrying out this function. Further, the Ministry of Natural Resources and Environment (MoNRE), which has been assigned the task of formulating, managing and enforcing policies, strategies and programs related to natural resources[7] (water being a natural resource), does not have a dedicated department within the Ministry to provide the full scope of technical support it would need to carry out this function with regards to water (see section on Institutional Framework in Water Governance).

7 PU A 222, Government of Malaysia. Ministers of the Federal Government Order 2009 - Ministerial Functions. 10 Apr 2009.

Table 1.3 – Major Ministries Involved in Some Aspects of Water Resources Management

Item	Name Of Ministries
1	Ministry of Natural Resources and Environment
2	Ministry of Energy, Green Technology and Water
3	Ministry of Agriculture and Agro-based Industries
4	Ministry of Federal Territories and Urban Well-being
5	Ministry of Works
6	Ministry of Housing and Local Government
7	Ministry of Rural and Regional Development
8	Ministry of Transport
9	Ministry of Health
10	Ministry of Tourism
11	Ministry of Youth and Sports
12	Ministry of Science, Technology and Innovation
13	Ministry of Plantation, Industry and Commodities

The Federal Constitution has provided the State Governments with an almost exclusive right to act as the custodians of water for the people. To aid the States in this responsibility and for uniformity in the execution of the task, the Waters Act was passed as far back as 1920. Individual States have adopted this law and it has served for many decades as the basis for water resources regulation in the country. For today's needs, however the law falls far short of purpose, and seeing this, some States have proceeded to enact a replacement law, or the Waters Enactment. Others States appear to wait for a Federal initiative in this direction, which consequently is the product of this present Study.

1.8 PILLARS OF WATER RESOURCES GOVERNANCE IN MALAYSIA

1.8.1 Adopting the IWRM Principles

Water resources in Malaysia have been subject to increasing pressures from multiple causes such as population growth, a growing economy, and an ever-increasing intensity of competition for water from various user-groups. So far, as seen above, a sectoral approach to water resources management has dominated the past and is still prevailing. This state of affairs is no longer seen as sustainable in the long-term and there are tremendous efforts by the Government to overcome this through the introduction of various approaches to ensure secure and sustainable water for all.

The move towards Integrated Water Resources Management (IWRM) is seen as an imperative for sustainable water resources management. It contrasts with the sectoral approach that has often resulted in duplication, waste and the use of unsustainable systems with inadequate outcomes. When water resource allocation and management decisions consider the effects of each use over the others, taking into account the overall social and economic goals including the achievement of sustainable development, integration of water resources management can be achieved at all levels; i.e. the local, river basin, regional and at the national level. This is basically the aim of IWRM proposed in this NWRS review. The

detailed methodology on IWRM is very much site specific and should be left to individual States to work out after this Study.

1.8.2 The National Water Vision

One of the main pillars in cementing the IWRM approach is the acknowledgement and general acceptance of the National Water Vision. The National Water Vision was put together as part of the journey towards adopting an IWRM approach proposed at the National Consultation Meeting on IWRM on 28 June 1999. It was subsequently formalised during the Seminar on '*Our Vision for Water in the 21st Century*' held in Kuala Lumpur on May 23-24, 2000. The Vision statement reads as follows:

"*In support of Wawasan 2020 (towards achieving developed nation status), Malaysia will conserve and manage its water resources to ensure adequate and safe water for all (including the environment)*".

The vision goes on further to identify four principal objectives, as follows:

- Water for people – all communities will have access to safe, adequate and affordable water supply, hygiene and sanitation;

- Water for food and rural development – provisions of sufficient water to ensure national food security and to promote rural development;

- Water for economic development – provisions of sufficient water to spur and sustain economic growth within the context of a knowledge-based economy and e-commerce; and

- Water for the environment – protection of the water environment to preserve water resources (both surface and groundwater resources) and the natural flow regimes, biodiversity and cultural heritage as well as the mitigation of water-related hazards.

The National Water Vision is very much aligned to the regional South East Asia Water Vision, which reads "*the attainment of sustainability of water resources to ensure sufficient water quality of acceptable quality to meet the needs of people of Southeast Asia in terms of health, food security, economy, and environment*".

There are similarities between the South East Asia Water Vision and the Malaysian National Water Vision because the former was drafted much later and is based on the Malaysian National Water Vision. The many geographical and socio-cultural similarities within the South East Asian countries make this similarity in the two visions quite logical and appropriate. Moreover, the challenges faced by countries in the ASEAN region with regards to water resources management and development, have many common features as seen in Section 4 on Institutional Framework in Water Resources Governance in this Volume 2.

To achieve the objectives of the National Water Vision, a National Framework for Action for water reforms was formulated having the following goals:

- Managing water resources efficiently and effectively (addressing both quantity and quality aspects) as water demands increase in tandem with population growth and industrialisation;

- Moving forward towards integrated river basin management taking cognizance of the fact that the river basin is a geographical unit with a well-defined boundary that contains the sum of all the hydrological processes operating within it, and transcending political and administrative constraints. It is therefore an ideal management unit to address water problems;

- Translating awareness to political will and capacities to create an enabling environment for the much-needed institutional reforms to deal with deterioration of water quality, decrease in water availability and conflicts among users (irrigation, hydropower, industry and domestic users). There is also a need to instil awareness of the economic, social and environmental value of water among politicians, decision-makers and all stakeholders;

- Moving towards adequate (safe) and affordable water services (befitting a developed nation status by 2020) through the provisions of adequate infrastructure for water delivery to all sectors of the economy.

1.8.3 From Vision to Action in Water Reforms

Following from the above, the setting up of the Ministry of Natural Resources and Environment (MoNRE) in 2004 to look after the administration of the nation's natural resources of land, water, forests, and minerals, is most definitely a major step in the right direction for implementation of IWRM principles in the country (see **Figure 1.6**). It now becomes this Ministry's function to formulate, manage, and enforce policies, legislation, and guidelines related to water resources care for the country. The move also sets the stage for water reforms, with the separation of '**water resources'** management from '**water delivery services'** management.

The re-organisation of Ministry of Energy, Water and Communications (MEWC) to the Ministry of Energy, Green Technology and Water (KeTTHA) in 2009 further enabled the separation of the water sector functions. The management of water delivery services is now left in the care of other ministries to look after, e.g. the Ministry of Energy, Green Technology and Water (KeTTHA) for potable water supplies, and the Ministry of Agriculture and Agro-based Industry for irrigation of agriculture lands. Additionally, as water resources administration without involvement in land and groundwater matters would not be complete, the MoNRE by virtue of its portfolio covered, is well set-up for the job in hand. However, there is one setback, it appears that the Ministry does not have a legal mandate to administrate all aspects related to water resources. This shortcoming will be addressed in the draft NWR Law on water resources management that is prepared in this Study.

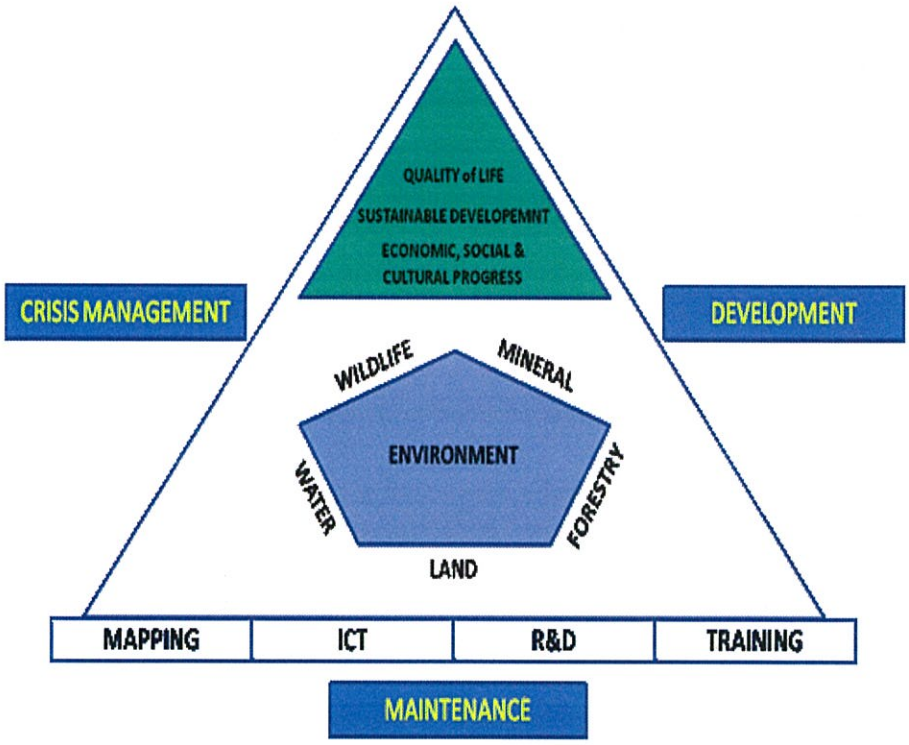


Figure 1.6 - Roles and Functions of MoNRE

1.8.4 Establishing the National Water Resources Council

As early as the nineties, the Malaysian Water Partnership (MyWP) organised consultation sessions among stakeholders in the water sector, to come up with directions for expediting water reforms in the country.

An important outcome of these efforts was the establishment of the National Water Resources Council (NWRC) in 1998. Originally, the Council was chaired by the YAB Prime Minister of Malaysia and serves as an advisory body on matters related to water governance. The first secretariat of the NWRC was the Water Supply Division of the JKR. Later however, the secretariat was passed on to be jointly shared by the MoNRE and KeTTHA. The NWRC members comprise a select group of Federal Ministers of Ministries having an involvement in water administration, and the Menteri Besars and Chief Ministers from all the States. Unfortunately, the NWRC suffers the setback of having no mandate and thus no *legal standi*. This Study proposes to address this issue through specific provisions in the draft NWR Law.

The NWRC's vision is to ensure there is sufficient quantity and quality of water readily available to meet the demands of all water users in Malaysia. The NWRC's mission sets out to:

- formulate a National Water Policy;
- facilitate harmonious and synergistic cooperation between the Federal and State Governments;
- facilitate development, allocation and management of the national water resources;

- ensure the development of national water resources is sustainable in terms of quantity and quality;
- ensure all environmental requirements are adhered to;
- assist in the allocation of water resources for various users and decide priorities during emergencies;
- advise State Governments on conservation, protection and gazetting of water catchments; and
- collect and collate information on national and State water resources availability and demand.

1.8.5 Integrating IWRM into the National 5-Year Development Plans

The NWRC's objectives for water reforms have been reflected in the nation's Eighth to Tenth Malaysia Plans. The thrust in the Eighth Malaysia Plan 2001 – 2005, was on conservation of the environment and sustainable management of the nation's natural resources. Planners of projects under the 5-year Plan were required to give due regards to these two aspects when framing projects. This initiative of the Government introduced an integrated and holistic approach to project planning, particularly in areas where there were concerns of air pollution, degradation of rivers, and groundwater contamination. The initiative also sets the stage for the adoption of river basins as planning units and brought about an impetus for establishing river basin organisations.

The policy of emphasis on integrated environmental management was continued under the Ninth Malaysia Plan 2006 – 2010 with the adoption of the IWRM concept in the country. Although not spelt out explicitly in the Tenth Malaysia Plan, the essence of it still prevails in the Plan. As water is a State matter, each State Government is encouraged to establish integrated water resources entities to ensure efficient planning, effective monitoring, enforcement and management of water resources on a river-basin-basis.

1.9 CAPACITY BUILDING

1.9.1 Training Forums

As the public at large and most stakeholders in the water sector were new to the concepts of IWRM, attention was directed to capacity building through a series of training and forums, awareness creation, and information-dissemination programs. These were designed with the view to enlighten members of the water community (policy-makers, administrators, managers and service providers) of their responsibilities and obligations in integrated water resources management. Some of the major forums held so far on the topics include:

- National Consultation on IWRM and formation of Malaysian Water Partnership (MyWP) (29 November 1997).
- Water Vision formulated after National Consultation Meeting on 28th June 1999.
- Workshop on "Our Vision for Water in the 21st Century – towards realising the National Water Vision" (May 23-24, 2000, Kuala Lumpur).

- National Conference on "Sustainable River Basin Management in Malaysia" (13-14 November 2000, Kuala Lumpur).
- Regional Forum on "Capacity Building for Integrated Water Resource Management in Southeast Asia" (December 2002, Kuala Lumpur).
- Workshop on Strategic Planning and Management of Water Resources in Malaysia (21-22 July 2003).
- National Dialogue on Effective Water Governance in Malaysia (6-7 October 2003, Kuala Lumpur).
- Malaysian Water Forum (8-10 June 2004, Kuala Lumpur).
- National Dialogue on Water Financing (February 2005, Kuala Lumpur).
- UNEP-sponsored Workshops on "Preparation of National Integrated Water Resources Management (IWRM) and Water Efficiency plan" (June-August 2006).
- Malaysian Water Forum in conjunction with 3rd SEA Water Forum (2007).

1.9.2 Studies and Projects

A number of key studies were carried out to provide the platform to launch water resources management in the country. Among these were:

- The National Economic Recovery Plan (National Economic Action Council, Economic Planning Unit, 1998);
- The National Physical Plan by the Department of Town and Country Planning, Ministry of Housing and Local Government, 2005;
- The National Water Resources Study 2000 – 2050 (Economic Planning Unit, 1999);
- The National Study for the Effective Implementation of Integrated Water Resources Management in Malaysia (2005 – 2006); and
- The Sarawak Integrated Water Resources Master Plan Study.

1.10 WATER REFORMS – "WHERE DO WE GO FROM HERE"

Water reforms in this country have been set in motion progressing towards IWRM year-by-year. It might perhaps be a little imperceptible to notice, but more and more integration of water resources management is taking place aided through the adoption of the National Water Vision and the formation of the NWRC. Even so, there still remains much more to be achieved. A few immediate areas needed, are discussed below.

1.10.1 Promote Uniformity in Water Resources Governance

The previous NWRS (2000) report called for a framework of integrated governance in water resources management at all levels. To date, some States have responded by forming governance structures at State levels and have enacted the necessary legislation to empower these entities. Examples of such State actions are the formation of the Lembaga Urus Air Selangor (LUAS) in Selangor, the formation of the Lembaga Urus Air Kedah or LUAN in Kedah, the *Badan Kawal Selia Air Pahang* (BaKSAP) in Pahang, the Sabah Water Resources Council in Sabah and the Sarawak Water Resources Council in Sarawak.

As will be explained later (see Section 4 on Institutional Framework in Water Resources Governance), the above independent moves by States although commendable are not necessarily the best approaches and could prove in the long-term to be an obstacle to IWRM, remembering the 'I' in IWRM relates to integration and thus uniformity of approach for the national good.

The major downside of these developments is that each State may develop dissimilar structures and legislations that may not be in line with the national aspiration of the country. With each State going their own separate path, the way forward looks more towards divergence rather than integration. Whilst under the Constitution, water is in the State List, it has to be appreciated that water does often cross State boundaries and sometimes even international boundaries in its path to the sea. This brings an added dimension to water resources administration, one that can be served well enough only by involving a level above the States into the process.

The principles of management, caring and sharing water have to have uniformity in application, and need be driven by guidelines, standards and criteria prepared at national level. Additionally, a federal initiative is also required if there is to be a common goal for water resource management to include resource sustainability, resource security, and resource sharing in the face of what can only be expected to be an ever-escalating and competing internal and external set of demands.

This Study (under directive of the ToR) addresses the above with a draft NWR Policy on water resources and recommendations for legislation to enable implementation of the policy. This is clearly an urgent need if there is to be uniformity in the adoption of IWRM in the country, along with a model law for water resource management.

1.10.2 Streamlining National Water Administration

Within the Federal structure, the governance for water is shared by a multitude of Government Ministries and Departments that manage a wide range of water-related sectors that sometimes are not necessarily looking at water as a resource *per se*. Foremost among them that deals with water are the MoNRE and KeTTHA. While both Ministries are tied closely with aspects of managing water, their mandates diverge considerably. The MoNRE is largely responsible in managing the country's natural resources as its vision states:

"To lead in sustainable management of natural resources and conservation of environment towards achieving the national vision".

KeTTHA's role, on the other hand, is to oversee the development of the service and supply sector (i.e. the water services sector) for portfolios under its mandate including water supply and sewerage.

1.10.3 Formation of a National Department of Water Resources in the MoNRE

The need to form a National Department for Water Resources (NWRD) is almost an immediately required action. The department in question should cover Federal duties on water resources in all its areas, which include coverage of surface water, groundwater coastal water and water in the atmosphere. There is no single department currently performing the full spectrum of these duties.

A likely candidate for the NWRD may well be the Department of Irrigation and Drainage (DID) Malaysia, with a name change and an extended list of responsibilities. More on this is discussed under Section 4 of this Volume on *Institutional Framework in Water Resources Governance.* For now, it may pointed out that the DID under the MoNRE, has a long history in managing water resources in the country in respect of flood mitigation, river basin management, coastal protection, water resource management, stormwater management and design and construction of dams for flood control, irrigation or water supply purposes. In the past the DID has positioned itself in tandem with the DOE, its sister agency under the MoNRE's umbrella to undertake integrated river basin management planning, which is a sub-set of IWRM. Throughout the last two Malaysia Plans, the respective Departments have been engaged in a number of river basin management programs that included river rehabilitation works and water quality improvement programs. Among the rivers in this list of works are; Sg Tebrau, Sg Segget and Sg Skudai, Sg Melaka, Sg Linggi, Sg Langat, Sg Sepetang, rivers in Cameron Highlands, Sg Sarawak, Sg Rajang, Sg Kinabatangan, Sg Merbok, Sg Kuantan, Sg Buloh, Sg Kerian-Kurau, Sg Selangor and Sg Bernam.

1.10.4 Formulation of National Policy and Update Existing Laws on Water Resources

The evolution towards the IWRM approach can be hastened through policy and legislation implemented at Federal level, where, historically, early management effort of water resources was principally to engage in flood control, irrigation, and potable water supply activities. These were times of water abundance, good water quality and meagre water demand as the population was low and industrial development was still in its infancy. Irrigated agriculture was the largest water use. However, the population of the country has since increased, the economy has grown exponentially, and thus the need for water has been greatly expanded and intensified, with the use of it, affecting the environment. Today's management of water requires diversified attention on a host of details. This can only be facilitated if there is a centrally subscribed policy on water resources and the law to give it the necessary mandate. Although there are policies and law related to water, these are somewhat dispersed into the functions of the many agencies that deal with water-related affairs on a sectoral basis. What is lacking that needs urgent attention is a national policy on water resources.

1.11 CONCLUDING OBSERVATIONS

Water resources governance is a process requiring an organisational structure. The process needs to be backed by an appropriate concept consistent with Malaysia's national identity, development goals, and a direction for achieving the said goals. To accomplish this, there is a need for a unified federal-level leadership that is able to meet the demands required for

successful implementation. Such a unified outcome can be best reached by a Government entity well-versed, experienced and equipped in water resources management matters.

At the conclusion of this Study, the Government should seek to finalise the draft NWR Policy and NWR Law developed within. Importantly, this Study has provided the basis (i.e. the draft NWR Policy and Law) to move forward the agenda for a more enhanced water governance regime. An important follow up from this Study should be that the draft NWR Policy, NWR Law and recommendations for institutional enhancement be finalised by decision-makers at the Federal and State Government levels, ideally with the State arrangements being complementary to the new federal regime.

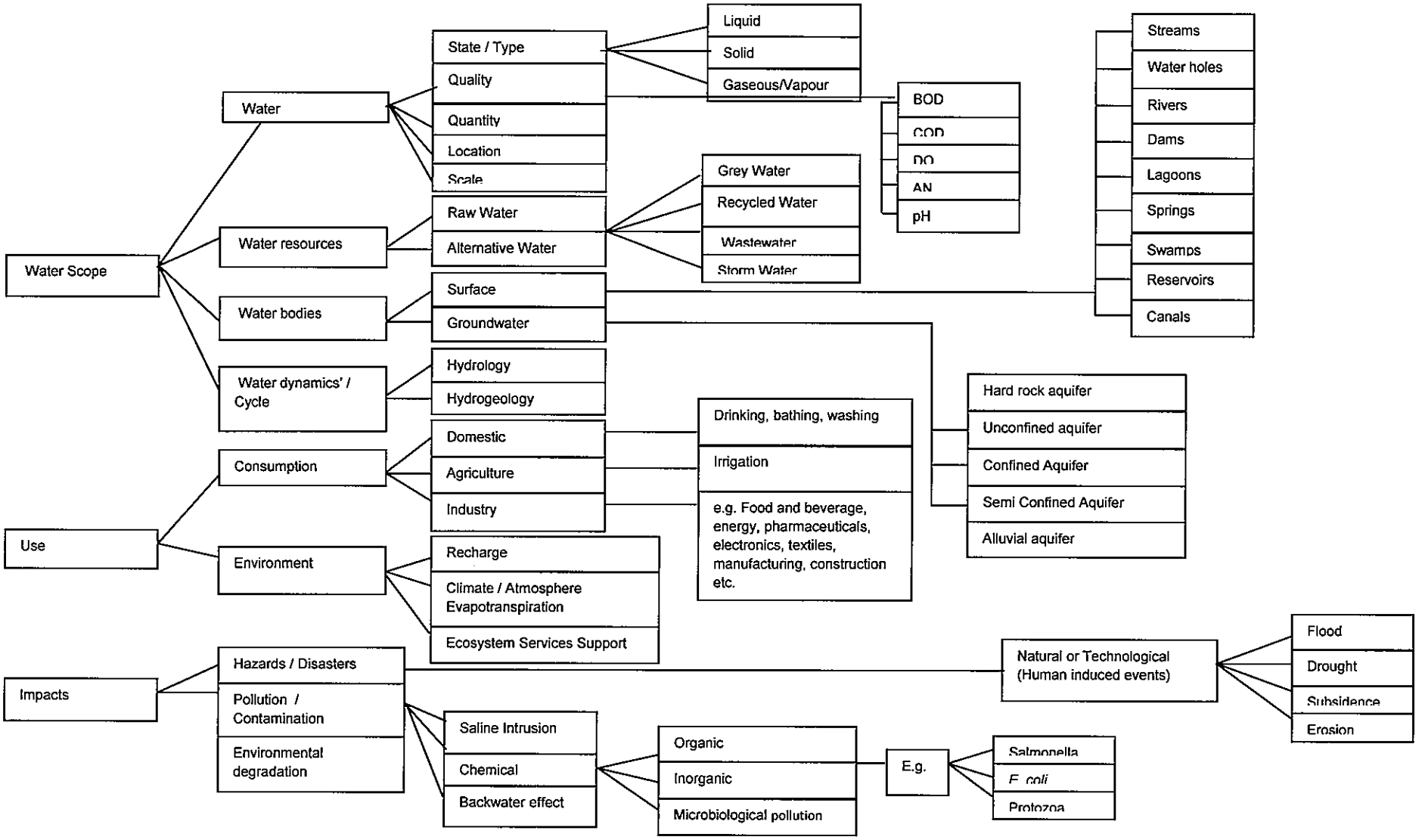


Figure 1.4 - Aspects of Water and Water Resources Governance

SECTION 2

NATIONAL WATER RESOURCES POLICY

Section 2 NATIONAL WATER RESOURCES POLICY

2.0 NATIONAL WATER RESOURCES POLICY

2.1 INTRODUCTION

In formulating the outline and proposal of policy 'content' of the National Water Resources Policy (NWR Policy), this component of the Study took great care to ensure that it was drafted in accordance to provisions of the Federal Constitution 1957, which serves as the backdrop from which the legislative and executive arms of government sources its mandates and powers from. In addition, it took note of the recent policy statements pertaining and relevant to policy formulation, contained in the Tenth Malaysia Plan (2011-2015), particularly statements in Chapter Six as reproduced with key phrases highlighted below:

> *Given the expected rapid pace of economic development,* ***sustainability of water resources is becoming an increasingly important issue.*** *Some states have already experienced shortages. The challenges in water resource management lies in addressing the mismatch between regions that have abundant access to water resources and those where economic and population growth, and hence demand, is high. During the Plan period,* ***NWR Policy will chart the future course for the sector.*** *In considering Malaysia's long term supply-demand profile,* ***the policy will outline measures to ensure efficient and effective management of this increasingly scarce resource, including streamlining policies and legislations to allow for more efficient and equitable distribution of water resources. The NWR Policy marks an important milestone, because it will establish a process for ensuring the security of water supply in an era of rapid economic development, growing cities and population growth, all of which have important implications on how Malaysia manages its water resources in the coming years.***
>
> *Other measures to be implemented during the Plan period include expanding the implementation of the* ***Integrated Water Resources Management*** *and* ***Integrated River Basin Management*** *approaches in planning, managing, protecting and rehabilitating water resources. The Government will provide RM5 billion for flood mitigation programmes. This includes the application of the* ***Integrated Flood Management*** *approach to manage the risks of flood damage through forecasting and warning facilities as well as the development of disaster preparedness and community awareness programmes and flood hazard maps. In addition,* ***research and development efforts will be intensified in area of conservation of water resources*** *to support efforts to* ***develop a sustainable water sector for the national economy.***

The emphasis in the above paragraphs is on 'means and measures', focusing on enabling processes, taking into account aspects of complementarity, whereby, the proposed Policy does not sit in isolation from the existing policy and legislative regimes related to water

resources, but serves to, where possible bridge and complement policy commitments, pegged to an overarching purpose. Noted also was the need to follow through existing approaches that have been accepted, ensuring that the platforms be 'structured' to facilitate their adoption or adaptation into existing approaches.

The policy formulation also took note of global considerations, which, and following on from previous comparative work on Australia, Brazil and South Africa, the initial draft was put together. Through a series of consultative sessions with key personnel from Jabatan Pengairan dan Saliran Malaysia (JPS), which later was expanded to include members from the MoNRE as well as representatives from the Attorney General's Chambers, key points and issues were flagged and the policy content was structured to help address them. In addition, the drafting also took note of the inputs gleaned from two earlier consultative national stakeholder workshops conducted, and again the issues and options captured were also taken into consideration and fed into the outline. This included also points raised during sessions that were held to garner further inputs at State level. The outline formulated was then tabled at the third consultative national stakeholder workshop on the 30 September to 1 October 2010, and further points raised there were also factored into the outline policy draft herein this section. Issues and recommendations raised in the other components of the Study were also reviewed and filtered into the outline. Reviews of literature were also undertaken, to ensure that 'current' thinking related to or pertaining to water resources were also considered (the list is as provided in the bibliography section of this report). Post the submission of the Draft Final Report, a panel of peer reviewers was instituted by the MoNRE, and this led to a revision of the draft NWR Policy, that was not included in the Draft Final Report that was circulated for technical review. The revision is included in this report, along with the feedbacks and recommendations made by the panel.

2.2 CONSIDERATIONS

As stated in the introduction, in determining the policy outline, four factors (as clustered) were considered, i.e. provisions for policy framing in the Federal Constitution 1957; issues and concerns raised by the study (sourced from the other study sections); points and recommendations from strategic consultation sessions; and recommendations put forward at the three consultation workshops conducted during the Study.

Key to drafting was the determination of the policy coverage and scale, and given that the policy was to serve as a NWR Policy of water resources, that by Constitution, if contained wholly within a particular State jurisdiction, would be a matter within the State purview. The structure of the policy too served as a challenge as a clear distinction had to be made on whether the policy would be a vertical or horizontal policy, as the terms water resources itself indicated that it covered a wide breadth of aspects and actions. As put forward earlier in the Interim Report, the breadth and scale of matters relating or pertaining to water resources stretches wide and far (as the diagram in the report indicated the clusters alone were multiple). In order to resolve this, an exercise was undertaken within the study group to put out a general list of the use of terms so as to enable 'easier' drafting.

The words were then carefully chosen and deliberated upon, so as to ensure that draft policy would encapsulate what is intended and to an extent, mean what it is meant to 'say'. This exercise also showed that there are many aspects that will have to be considered when drafting the NWR Policy.

Fundamental, as stated earlier, was the determination of mandates to even draft the policy, let alone determine the contents, as 'water' has its own home within the Federal Constitution. Resolving this required detailed reading of the Federal Constitution, to determine the actual structure and scope of the draft policy, as it was as noted in the Interim Report earlier, the policy implementation part would actually transcend strict jurisdictions and it is intended that it would through a partnership be carried out by all stakeholders.

Key provisions of the Federal Constitution considered include:

Article 73. Extent of Federal and State Laws.
In exercising the legislative powers conferred on it by this Constitution—
(a) Parliament may make laws for the whole or any part of the Federation and laws having effect outside as well as within the Federation;
(b) The Legislature of a State may make laws for the whole or any part of that State.

Article 74. Subject matter of federal and State laws.
(1) Without prejudice to any power to make laws conferred on it by any other Article, Parliament may make laws with respect to any of the matters enumerated in the Federal List or the Concurrent List (that is to say, the First or Third List set out in the Ninth Schedule).
(2) Without prejudice to any power to make laws conferred on it by any other Article, the Legislature of a State may make laws with respect to any of the matters enumerated in the State List (that is to say, the Second List set out in the Ninth Schedule) or the Concurrent List.
(3) The power to make laws conferred by this Article is exercisable subject to any conditions or restrictions imposed with respect to any particular matter by this Constitution.
(4) Where general as well as specific expressions are used in describing any of the matter enumerated in the Lists set out in the Ninth Schedule the generality of the former shall not be taken to be limited by the latter.

Article 75. Inconsistencies between federal and State laws.
If any State law is inconsistent with a federal law, the federal law shall prevail and the State law shall, to the extent of the inconsistency, be void.

Article 76. Power of Parliament to legislate for States in certain cases.
(1) Parliament may make laws with respect to any matter enumerated in the State List, but only as follows, that is to say:
(a) for the purpose of implementing any treaty, agreement or convention between the Federation and any other country, or any decision of an

international organization of which the Federation is a member; or

(b) for the purpose of promoting uniformity of the laws of two or more States; or

(c) If so requested by the Legislative Assembly of any State.

(2) No law shall be made in pursuance of paragraph (a) of Clause (1) with respect to any matters of Islamic law or the custom of the Malays or to any matters of native law or custom in the States of Sabah and Sarawak and no Bill for a law under that paragraph shall be introduced into either House of Parliament until the Government of any State concerned has been consulted.

(3) Subject to Clause (4), a law made in pursuance of paragraph (b) or paragraph (c) of Clause (1) shall not come into operation in any State until it has been adopted by a law made by the Legislature of that State, and shall then be deemed to be a State law and not a federal law, and may accordingly be amended or repealed by a law made by that Legislature.

(4) Parliament may, for the purpose only of ensuring uniformity of law and policy, make laws with respect to land tenure, the relations of landlord and tenant, registration of titles and deeds relating to land, transfer of land, mortgages, leases and charges in respect of land, easements and other rights and interests in land, compulsory acquisition of land, rating and valuation of land, and local government; and Clauses (1)(b) and (3) shall not apply to any law relating to any such matter.

Article 76A. Power of Parliament to extend legislative powers of States.

(1) It is hereby declared that the power of Parliament to make laws with respect to a matter enumerated in the Federal List includes power to authorize the Legislatures of the States or any of them, subject to such conditions or restrictions (if any) as Parliament may impose, to make laws with respect to the whole or any part of that matter.

(2) Notwithstanding Article 75, a State law made under authority conferred by Act of Parliament as mentioned in Clause (1) may, if and to the extent that the Act so provides, amend or repeal (as regards the State in question) any federal law passed before that Act.

Any matter with respect to which the Legislature of a State is for the time being authorized by Act of Parliament to make laws shall for purposes of Articles 79, 80 and 82 be treated as regards the State in question as if it were a matter enumerated in the Concurrent List.

Article 77. Residual power of legislation.

The Legislature of a State shall have power to make laws with respect to any matter not enumerated in any of the Lists set out in the Ninth Schedule, not being a matter in respect of which Parliament has power to make laws.

Article 78. Legislation restricting use of rivers.

In so far as any law made by Parliament or any regulation made in pursuance of such a law restricts the rights of a State or its residents to the use for navigation or irrigation of any river wholly within that State it shall not have effect in that State unless it has been approved by a resolution of the Legislative Assembly of that State supported by

a majority of the total number of its members.

Article 79. Exercise of concurrent legislative powers.

(1) Where it appears to the presiding officer of either House of Parliament or of the Legislative Assembly of any State that a Bill or an amendment to a Bill proposes a change in the law relating to any of the matters enumerated in the Concurrent List, or to any of the matters enumerated in the State List with respect to which the Federation is exercising functions in accordance with Article 94, he shall certify the Bill or amendment for the purposes of this Article.

(2) A Bill or amendment certified under this Article shall not be proceeded with until four weeks have elapsed since its publication, unless the presiding officer, being satisfied that the State Governments, or as the case may be, the Federal Government, have been consulted, allows it to be proceeded with on the ground of urgency.

Article 80. Distribution of Executive powers.

(1) Subject to the following provisions of this Article the executive authority of the Federation extends to all matters with respect to which Parliament may make laws, and the executive authority of a State to all matters with respect to which the Legislature of that State may make laws.

(2) The executive authority of the Federation does not extend to any matter enumerated in the State List, except in so far as is provided in Articles 93 to 95, nor to any matter enumerated in the Concurrent List, except in so far as may be provided by federal or State law; and so far as federal or State law confers executive authority on the Federation with respect to any matter enumerated in the Concurrent List it may do so to the exclusion of the executive authority of the State.

(3) So far as a law made under Clause (4) of Article 76 makes provisions for conferring executive authority on the Federation it shall not operate in any State unless approved by resolution of the Legislative Assembly of that State.

(4) Federal law may provide that the executive authority of a State shall extend to the administration of any specified provisions of federal law and may for that purpose confer powers and impose duties on any authority of the State.

(5) Subject to any provisions of federal or State law, arrangements may be made between the Federation and a State for the performance of any functions by the authorities of the one on behalf of the authorities of the other and such arrangements may provide for the making of payments in respect of any costs incurred under the arrangements.

(6) Where, in pursuance of Clause (4), any functions are conferred by federal law on any authority of a State the Federation shall make such payments to the State as may be agreed between the Federation and the State or as may in default of agreement be determined by a tribunal appointed by the Chief Justice of the Federal Court.

Article 81. Obligation of States towards Federation.

The executive authority of every State shall be so exercised—

(a) as to ensure compliance with any federal law applying to that State; and

(b) as not to impede or prejudice the exercise of the executive authority of the Federation.

Article 92. National development plan

(1) If, after a recommendation from an expert committee and after consultation with the National Finance Council, the National Land Council and the Government of any State concerned, the Yang di-Pertuan Agong is satisfied that it is conducive to the national interest that a development plan be put into operation in any area or areas in one or more of the States, the Yang di-Pertuan Agong may, after publishing the plan, proclaim the area or areas as a development area; and thereupon Parliament shall have power to give effect to the development plan or any part thereof, notwithstanding that any of the matters to which the plan relates are matters with respect to which, apart from this Article, only States would have power to make laws.

(2) Any Act passed in pursuance of this Article shall recite that it has been so passed and that the provisions of Clause (1) have been complied with; and Article 79 shall not apply to any Bill for such an Act or any amendment to such a Bill.

(3) In this Article, "development plan" means a plan for the development, improvement, or conservation of the natural resources of a development area, the exploitation of such resources, or the increase of means of employment in the area.

(4) Without prejudice to their power under any other Article to require any interest in land to be acquired or granted for federal purposes, the Federal Government may from time to time require the reservation for the purposes of a development plan, to such extent as they may specify, of any land in a development area which is not occupied by private persons; but any diminution, in consequence of the reservation, of the annual revenue received by a State shall be made good to the State by the Federation.

(5) All income received by the Federation through the operation of a development plan shall, subject to Clause (6), be applied—

(a) in the first instance, for the provision of capital and the meeting of working expenses for the development plan;

(b) in the second instance, for the repayment to the Federation of any expenditure, including expenditure under Clause (4), incurred by the Federation in operating the plan; and

(c) as to the balance, for payments to the State in which the development area is situated or, if it is situated in two or more States, to those States in such proportions as the Federal Government may determine.

(6) If it is agreed between the Federal Government and the Government of any State which includes the whole or any part of the development area that any expenditure incurred in operating the development plan is to be met by the State, any expenditure so met shall be repaid to the State and the repayment

shall rank *pari passu* with the repayment to the Federation of any expenditure incurred by the Federation.

(7) Parliament may repeal or amend any Act passed in pursuance of this Article, and for that purpose may make such incidental and consequential provisions as it may consider necessary.

(8) Nothing in this Article shall affect the power of Parliament or of the Legislature of any State—

(a) to impose such taxes or rates as it is authorized to impose under any other provision of this Constitution; or

(b) to make from the Federal Consolidated Fund or the State Consolidated Fund, as the case may be, grants not repayable under Clause (5) or (6), except that where, in pursuance of Clause (1), a rate is imposed on any property by federal law which, but for this Article, might have been imposed by State law, no rate of the same kind shall be imposed by State law for any period for which the rate imposed by federal law is payable.

Article 93. Inquiries, surveys and statistics.

(1) The Federal Government may conduct such inquiries (whether by Commission or otherwise), authorize such surveys and collect and publish such statistics as it thinks fit, notwithstanding that such inquiries, surveys and collection and publication of statistic relate to a matter with regard to which the Legislature of a State may make laws.

(2) It shall be the duty of the Government of a State, and of all officers and authorities thereof, to assist the Federal Government in the execution of its powers under this Article; and for this purpose the Federal Government may give such directions as it may deem necessary.

Article 94. Federal powers in respect of State subjects.

(1) The executive authority of the Federation extends to the conduct of research, the provision and maintenance of experimental and demonstration stations, the giving of advice and technical assistance to the Government of any State, and the provision of education, publicity, and demonstration for the inhabitants of any State, in respect of any of the matters with respect to which the Legislature of a State may make laws; and the agricultural and forestry officers of any State shall accept any professional advice given to the Government of that state under this Clause.

(2) Notwithstanding anything in this Constitution, the existing Departments of Agriculture, Commissioner of Lands, Forestry and Social Welfare may continue to exercise the functions exercised by them immediately before Merdeka Day.

(3) Nothing in this Constitution shall prevent the Federal Government from establishing Ministries or Departments of Government to exercise the functions of the Federal Government under Article 93 and this Article in relation to matters within the legislative authority of a State, and such matters may include soil conservation, local government and town and country planning.

Article 95. Inspection of State activities.

(1) Subject to Clause (3), in exercising the executive authority of the Federation any officer authorized by the Federal Government may inspect any department or work of a State Government with a view to making a report thereon to the Federal Government

(2) A report made under this Article shall, if the Federal Government so direct, be communicated to the State Government and laid before the Legislative Assembly of the State.

(3) This Article does not authorize the inspection of any department or work dealing only with or carried on only with respect to matters with the exclusive legislative authority of a State.

What became clear from the Constitutional provisions referred was that the draft policy should focus on matters that emphasises on means and measures, the ways those means and measures could be effected rather than address matters related to control. As a policy would be the executive exercise of an authority with mandate that the emphasis, particularly at the national level and scale would be to adopt an approach that enables, facilitates and ensures rather than direct, dictate or control. Based on the same provisions that are listed above, key words were gleaned and matched with concerns raised during the multiple sessions of discussion and consultations.

2.3 POLICY FRAMING

The policy framing exercise, involved sifting through multiple inputs from various sources and platforms as mentioned earlier. This meant a process had to be instituted to ensure that all aspect could be considered before the rationale for a policy could be developed. For this purpose a worksheet was developed and personnel from JPS Malaysia provided valuable input to help structure the inputs gained and put the proposed policy into context. Two separate activities, both parallel to each other was instituted, the worksheet being one and the mapping of linkage between core areas identified to ground the policy direction with existing policy linkage as well as ministries or agencies and related legislative regime that could put the policy 'into action' (see Section 2.4 below). The worksheet used was structured to resolve matters pertaining to policy directions. Due to the size of the worksheet, the sample worksheet used to help frame the justification for a national water resources policy during consultative sessions with JPS key personnel in June and July 2010 is provided for in **Annex 2.1**.

2.4 ENSURING 'COMPLEMENTARITY'

Parallel to the worksheet exercise, a profile of linkages between the core areas and thrusts identified as well as strategies were actually matched to existing national policies (51 in total) and out of which 18 were identified, and based on this identification, a list was drawn up on the ministries and laws applicable that could help implement policy provisions. An excerpt of the extensive list, that served as a point of reference, is reproduced in its unedited working template form as **Annex 2.2**. The purpose it is attached to this report is to indicate the gravity of the work undertaken to ensure that stakeholders are at least profiled. Though subsequent

to the list being developed changes were made to the draft policy outline, it still served as an invaluable reference to ensure and identify the practicality of proposals made in respect of the draft policy. Attached also in **Annex 2.3** is the outline of a second worksheet used to ensure that whatever that is included could be made practical. The list of 18 National Policies reviewed and mapped in detail below are:

(i) Ministry of Natural Resources and Environment
- National Mineral Policy 2
- National Forestry Policy 1978
- National Biodiversity Policy
- National Wetlands Policy
- National Environment Policy
- National Policy on Climate Change

(ii) Ministry of Education
- National Education Policy

(iii) Ministry of Plantation Industries and Commodities
- National Biofuel Policy
- The National Timber Industry Policy

(iv) Ministry of Energy, Green Technology and Water
- National Energy Policy
- National Green Technology Policy

(v) Ministry of Science, Technology and Innovation
- National Biotechnology Policy

(vi) Ministry of Tourism
- National Tourism Policy

(vii) Ministry of Agriculture and Agro-Based Industry
- Third National Agricultural Policy
- Food Security Policy

(viii) Ministry of Health
- National Food Safety Policy

(ix) Ministry of Housing and Local Government
- National Solid Waste Management Policy
- National Physical Plan

In addition as this draft policy initiative is mooted by the MoNRE through the JPS Malaysia, the following policies were used as a guide in structuring the draft NWR Policy, i.e.:

(i) National Mineral Policy 2

(ii) National Forestry Policy
(iii) National Biodiversity Policy
(iv) National Wetlands Policy
(v) National Environment Policy
(vi) National Policy on Climate Change

After much discussion, and after the third Consultative Workshop, adjustments were made with the initial draft policy outlined, and the structure was revised as follows:

- Core areas – areas that would ground the policy and serve as the super clusters.
- Thrust areas – areas that would provide the direction.
- Target – matters to be achieved in addressing issues and options raised throughout the Study

2.5 OUTLINING THE DRAFT NWR POLICY

The first step taken in outlining the draft policy was to determine the content outline, and determine the applicable time frame. It was after much consultation, it was resolved that the proposed draft policy should be time bound and not be structured in perpetuity, and it was also recommended that it follows the Malaysia Development Plans time line, so as to align the budgetary aspects. It was agreed at various discussion and consultation platforms that the outline adopted should not deviate from existing formats adopted by the MoNRE. This led to the following content outline being proposed as shown below:

- **Message (Minister)**
- **Foreword (KSU)**
- **Preamble**
- **Policy Statement**
- **Policy Rationale**
- **Policy Objectives**
- **Policy Principles**
- **Policy Cores Areas, Thrusts, Strategy and Strategic Actions**
  (i) Policy Core Area 1: Water Resources Security
  (ii) Policy Core Area 2: Water Resources Sustainability
  (iii) Policy Core Area 3: Partnerships
  (iv) Policy Core Area 4: Capacity Building
- **Implementation Plan**

(i) Policy Statement

Determining the policy statement required consultations at both strategic level and workshop level. Based on the tabling of the draft policy statement, the following was drafted, and remains as the statement proposed by this Study:

> **To ensure the sustainable use and development of water resources in Malaysia, water resources shall be treated as a national priority and the conservation and management of water resources shall be effected through a mechanism of shared partnership involving all stakeholders.**

The statement to an extent reflects the statements in the Tenth Malaysia Plan (2011-2015), and has three important components:

Sustainable use and development: by using the word 'ensure' the policy statement seeks to set out means and measures that will help put into place a plan of action, as the word 'ensure' denotes an emphasis on how and what.

National priority: the keywords here places emphasis on treating water resources as a national asset as it serves as a catalyst to national development, and it is the very building block of life. It is a unitary element in the environment; it is to a certain extent renewable and replenishable but is vulnerable to impacts, threats and disasters. Its adaptability to change requires national attention, to ensure that it remains available and sustainable for multiple uses.

Conservation and management through partnership: This sets out the recognition that water resources has multiple stakeholders with varying degrees of stakeholding, thus the management and conservation of the same should be effected through a mechanism of partnerships, which is provided for in the Federal Constitution itself, whereby both Federal and State government can forge partnerships to ensure certain things are carried out or implemented. It also recognises that the partnership extends beyond traditional government stakeholders and stakeholdings.

This statement then should when translated through the proposed thrusts, targets, strategies and action plans, result in a structured and cohesive effort that looks at water in its whole entirety, both as an asset, catalysts and the services it provides that supports life and ensures wellbeing in addition to ensuring environmental and ecosystem integrity. The proposed policy also sets out some proposed 'measurable' outputs and outcomes (see **Annexes 2.4. and 2.6.**).

(ii) Policy Rationale

As the above statement, a proposed paragraph on the rationale was also tabled at various consultative platforms, and the study proposes the following:

> This NWR Policy shall set the strategic framework for action to ensure that water resources are used and developed in a sustainable manner to benefit the nation both people and environment as a whole, setting out strategies that will help guide the many water resources stakeholders to structure actions that will effect better conservation and management of water resources in an integrated, concerted and coordinated manner, bearing in mind that water resources may transcend traditional jurisdictional boundaries.

The rationale above seeks to address the following:

- The NWR Policy will set the framework for water resources governance – introduce sustainability and uniformity.
- The NWR Policy will benefit the nation.
- Policy 'limitations' (note: protect State rights and protect from rights and jurisdictional conflicts; protect States in the event of crisis and disaster; facilitating assistance overriding State privileges).

(iii) Policy Objectives

The proposed draft NWR Policy is hinged on three key objectives:

- To set direction to facilitate uniformed actions towards ensuring water resources security and sustainability.
- To set out mechanisms and identify processes to facilitate concerted actions for water resources security and sustainability.
- To establish mechanisms for partnership between multiple stakeholders and means for stakeholder engagement.

The objectives are self-explanatory, the first looks at consolidating the what and how; the second sets out to structure uniformed approaches and means; and the third provides means for partnership establishment.

(iv) Policy Principles

Discussions also led to identifying key values that will serve as the grounding principles that will guide implementation, and the following are proposed:

- **Water Resources Security**

  Water resources is of primary national interest thus its security is paramount.

- **Water Resources Sustainability**

  Water resources is the catalyst for environment and development therefore it should be sustained for present and future uses and Federal and State Governments will look at optimising and minimising wastage of water resources. It also opens up the opportunity to bolster self-dependency of states, to not just rely on transfers but to shift towards exploring alternative sources, and address aspects related to demand management.

- **Partnership**

  Stakeholder inclusiveness and collaboration is essential towards ensuring the security and sustainability of water resources as well as achievement of common goals towards addressing multiple water resources governance concerns and priorities.

(v) Policy Cores Areas, Thrusts, Targets, Strategies and Action Plans
Grounding the policy are four core key areas that will help cluster all actions; i.e.:

- Policy Key Core Area 1: Water Resources Security
- Policy Key Core Area 2: Water Resources Sustainability
- Policy Key Core Area 3: Partnerships
- Policy Key Core Area 4: Capacity Building

The detailed aspects of this section can be seen at Section 2.6 and **Annex 2.6**.

(vi) Implementation Plan

It is intended here that the policy is implemented through a stakeholder partnership arrangement, helmed by the MoNRE Malaysia that serves as a secretariat to the NWRC, and has as a principle function under its Ministerial mandate, water resources management and conservation. Important to note also water resources makes up a component in natural resources and serves as the catalyst for environmental integrity, both which are areas within the MoNRE purview. As stated earlier, the NWR Policy is a time bound policy matched to the Malaysia Development Plans time line, and revisions can be instituted focusing on any aspect be it core area, thrusts, targets, strategies or action plans.

2.6 MATCHING CORE AREAS, THRUSTS AND TARGETS TO KEY POLICIES

Once the above was determined, each key core area was fleshed out in detail as follows, and an indicative set of indicators to help monitor implementation were also developed. The same can be viewed at **Annex 2.6**. Key here was an exercise to match against the key core areas, thrusts and targets identified with the 18 policies shortlisted. The exercises are divided into the key core areas, the excerpts are as shown below and labelled in **Tables 2.1 to 2.4** The profiling also sets out the potential stakeholders that can help effect the implementation of the action plans set out in **Annex 2.6**.

Table 2.1 - Profile Linking Key Core Area 1, Thrusts and Targets with Key Existing Policies and Relevant Stakeholder

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 1 : Water Intelligence	Target 1 : Develop a comprehensive information system on, about and for water resources	National Green Technology Policy	• The establishment of the Ministry of Energy, Green Technology and Water reflects Malaysia's seriousness in driving the message that 'clean and green' is the way forward towards creating an economy that is based on sustainable solutions. [3:4:3] Water and Waste Management Sector • Technology in the management and utilization of water resources, waste water treatment, solid waste and sanitary landfill; and [9:5:4]	Ministry of Energy, Green Technology And Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembentungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)
		National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Policy on Climate Change	KA17 - ST4 Develop national carbon accounting systems and baseline studies of forest ecosystems.[12:3:8] KA29 - ST7 Strengthen national data repository through periodic national inventory by: • Reviewing and expanding the role of the Department of Statistics as the central depository for environmental information, including GHG; • Formulating measures for responsible reporting and collation of data by the Department of Statistic, key agencies and other stakeholders; and • Establishing database inventory on natural disasters and extreme weather events [16:3]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Physical Plan	• Developments within water catchment areas and other environmentally sensitive areas should be carefully monitored. Water resource management based on the concept of Integrated River Basin Management (IRBM) should be exercised. [12:10:2]	Ministry of Housing And Local Government	• Federal Department of Town And Country Planning Peninsular Malaysia • National Housing Department • Local Government Department • National Landscape Department • National Solid Waste Manage-ment Department • Solid Waste And Public Cleansing Management Cooperation

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
	Target 2 : Strengthen database framework, software support, roster of trained experts	National Policy on Climate Change	KA26 - ST6 Integrate climate change considerations at the planning level by applying tools that includes the following: • Integrated Environmentally Sensitive Areas; • Strategic Environmental Assessment; • Economic Evaluation of Ecological Services; • Sustainable Development Indicators. [15:3]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2]		
		National Green Technology Policy	Water and Waste Management Sector • Technology in the management and utilization of water resources, waste water treatment, solid waste and sanitary landfill; and [9:5:4]	Ministry of Energy, Green Technology And Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembentungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
	Target 3 : Improve and shift towards standardization of multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources	National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2] • For river basin management and related development projects, specific procedures for planning, including beneficial-use classification, coordination, and monitoring measures shall be incorporated to ensure sustainability. [12:2:1]	Ministry of Natural Resources And Environment	• Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Environment • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Policy on Climate Change	ST7-P3: Support knowledge-based decision making through intensive climate related research and development and capacity building of human resources.[7:1] KA1 - ST1 Conduct systematic reviews and harmonise existing legislation, policies and plans, taking into account and proposing relevant balanced adaptation and mitigation measures, to address the following: (see Policy) KA25 - ST6 Integrate measures into policies, plans, programmes and projects in the following areas: (see Policy) KA28 - ST7 Establish and implement a national R&D agenda on climate change taking into account the following areas: (see Policy) KA32 - ST7 Identify a coordinating mechanism to oversee R&D activities, information dissemination, avoidance of duplication, and to support decision making. [17:2]		

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 2: Water Resources Integrity	Target 4 : Set national standards to determine thresholds for water resources to protect resources, its availability and integrity of water bodies	National Green Technology Policy		Ministry of Energy, Green Technology And Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembentungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)
		National Policy on Climate Change	P2: Conservation of Environment and Natural Resources Strengthen implementation of climate change actions that contribute to environmental conservation and sustainable use of natural resources. [5:3] KA27 - ST6 Enhance the coordinating mechanism to oversee the planning, implementation and monitoring of climate change measures. [15:4]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2] • For river basin management and related development projects, specific procedures for planning, including beneficial-use classification, coordination, and monitoring measures shall be incorporated to ensure sustainability. [12:2:1]		

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
	Target 5 : Reduce vulnerability of water resources to impacts and threats as well as strengthen adaptability to ecosystems and physical changes	National Policy on Climate Change	P2: Conservation of Environment and Natural Resources Strengthen implementation of climate change actions that contribute to environmental conservation and sustainable use of natural resources. [5:5] KA7 - ST2 Integrate balanced adaptation and mitigation measures into development plans. [9:4] KA15 - ST4 Conserve and enrich carbon pools in natural ecosystems including plantations and promote rehabilitation of sensitive and degraded ecosystems through sound management practices and land use planning. [12:1] KA16 - ST4 Identify and recognise the attribute and value of ecosystem services and integrate into the development planning process. [12;2] KA25 - ST6 Integrate measures into policies, plans, programmes and projects in the following areas: (see policy)	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM)

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
	Target 6 : Develop water resources conservation plans for strategic, sensitive and critical water resources areas and bodies	National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2] • In areas where intensive or extensive use of resources such as land, water and the marine environment is proposed, development planning shall be on a regional basis rather than on a project basis, taking into consideration both economic development and environmental protection objectives.[15:3:3]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Policy on Climate Change	P2: Conservation of Environment and Natural Resources Strengthen implementation of climate change actions that contribute to environmental conservation and sustainable use of natural resources. [5:5] KA7 - ST2 Integrate balanced adaptation and mitigation measures into development plans. [9:4] KA25 - ST6 Integrate measures into policies, plans, programmes and projects in the following areas: (see Policy)		

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Physical Plan	• Future water supply needs will also be safeguarded by conserving Potential River and underground sources of water. [5:5:1] • The supply and projected demand for water by quantity and location should guide the planning of water resources areas.[7:11:1]	Ministry of Housing And Local Government	• Federal Department of Town And Country Planning Peninsular Malaysia • National Housing Department • Local Government Department • National Landscape Department • Solid Waste And Public Cleansing Management Cooperation • National Solid Waste Management Department
Thrust 3 : Alternative Options for Water Resources Use	Target 7 : Explore options for alternative or contiguous of water resources	National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2] • In areas where intensive or extensive use of resources such as land, water and the marine environment is proposed, development planning shall be on a regional basis rather than on a project basis, taking into consideration both economic development and environmental protection objectives.[15:3:3]		• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 1 : WATER RESOURCES SECURITY				Note: Reference: [a: b: c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 4 : Disaster Risk Preparedness and Response	Target 8 : Strengthen measures for preparedness and response as well as reduction of risks and threats from disasters	National Policy on Climate Change	P1: Development on a Sustainable Path Integrate climate change responses into national development plans to fulfil the country's aspiration for sustainable development. [5:1] P3: Coordinated Implementation Incorporate climate change considerations into implementation of development programmes at all levels. [5:3] ST4-P2:Adopt balanced adaptation and mitigation measures to strengthen environmental conservation and promote sustainability of natural resources. [6:4] KA1 - ST1 Conduct systematic reviews and harmonise existing legislation, policies and plans, taking into account and proposing relevant balanced adaptation and mitigation measures, to address the following: (see Policy) KA12 - ST4 Integrate balanced adaptation and mitigation measures into policies and plans on environment and natural resources. [11:1]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Policy On Biological Diversity	• Loss of genetic resources, floods, deterioration in quantity and quality of water supply, decline in food supply, loss in productive soils, and loss in potentially useful biological resources are some of the detrimental effects of the reduction in or loss of biological diversity. [6:6:6]		

Table 2.2 - Profile Linking Key Core Area 2, Thrusts and Targets with Key Existing Policies and Relevant Stakeholder

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 5 : Promote Consistent Application of Criteria & Characterization of Water Resources	Target 1 : Establish uniformed measure and guidelines	National Policy on Climate Change	ST1-P1: Facilitate the harmonisation of existing policies to address climate change adaptation and mitigation in a balanced manner. [6:1] ST6-P3: Institutionalise measures to integrate cross- cutting issues in policies, plans, programmes and projects in order to increase resilience to climate change.[6:6] KA1 - ST1 Conduct systematic reviews and harmonise existing legislation, policies and plans, taking into account and proposing relevant balanced adaptation and mitigation measures, to address the following: (see Policy) KA5 - ST2 Incorporate and facilitate implementation of climate- friendly measures and technologies by strengthening the following: • Laws and regulations and Enforcement; • Human resource development • Finance and incentives; • Research and development; • Transfer of technology; and • Outreach to relevant stakeholders. [9:2] KA12 - ST4 Integrate balanced adaptation and mitigation measures into policies and plans on environment and natural resources. [11:1]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
			KA25 - ST6 Integrate measures into policies, plans, programmes and projects in the following areas: (see Policy) KA33 - ST7 Institutionalise measures to strengthen effective linking of climate science and policy. [17:3]		
		National Green Technology Policy	• The establishment of the Ministry of Energy, Green Technology and Water reflects Malaysia's seriousness in driving the message that 'clean and green' is the way forward towards creating an economy that is based on sustainable solutions.[3:4:3]	Ministry of Energy, Green Technology And Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembentungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)
Thrust 6 : Conserve and Protect Water Resources and Bodies, both Natural and Artificial	Target 2 : Determine priority of water resources use	National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, and encourage recycling as well as efficient and appropriate use. [12:1:2]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Park Malaysia (JLTM)
	Target 3 : Protect and maintain	National Green Technology Policy	Water and Waste Management Sector • Technology in the management and utilization of water resources, waste water	Ministry of Energy, Green Technology And Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembentungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
	condition and state of water bodies		treatment, solid waste and sanitary landfill; and [9:5:4]		
		National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, encourage recycling as well as efficient and appropriate use.[12:1:2]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Consumer Policy	• Promoting sustainable use of the prudent spending, use of natural resources and facilities such as water and energy up to the prudent, and maintain the prosperity and welfare of the current generation of users and future generations.[2:5:3]	Ministry of Domestic Trade, Co-Operative And Consumerism	
		National Forestry Policy	• The intention to maintain a clean environment, unpolluted water, and renewable forest resources is to fulfil the needs and aspirations of the nation[1:3:1]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
					• Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Physical Plan	• Ground water resources and recharge areas shall be identified and protected from activities that cause pollution and reduce yield.[7:12:1]	Ministry of Housing And Local Government	• Federal Department of Town And Country Planning Peninsular Malaysia • National Housing Department • Local Government Department • National Landscape Department • Solid Waste And Public Cleansing Management Cooperation • National Solid Waste Management Department
	Target 4 : Develop and establish economic instruments and measures to value water resources	National Climate Change Policy	ST2-P1: Institute measures to make development climate-resilient through low carbon economy to enhance global competitiveness and attain environmentally sustainable socio-economic growth. [6:2] ST3-P1: Support climate-resilient development and investment including industrial development in pursuit of sustainable socio-economic growth. [6:3] KA6 - ST2 Allocate adequate financing and appropriate technological measures for promoting low carbon economy through the following (see Policy) KA13 - ST4 Incorporate measures, including mobilising	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
			financing and technical assistance, into the following areas: (see Policy)		
		National Urbanization Policy	• Rapid urban development has contributed to the degradation of environmental quality especially the quality of water, air and noise. Many rivers which are major sources of water have undergone degradation in water quality due to pollution from domestic waste, industrial effluents, suspended particulates from soil erosion and heavy metal pollution from factories. Based on a report by the Department of Environment, there are 9 polluted river basins in 2004, among them Sg Klang and Sg Buloh in Selangor, Sg Juru in Pulau Pinang and Sg Sengget in Johor.[14:1:3]	Ministry of Housing And Local Government	• Federal Department of Town And Country Planning Peninsular Malaysia • National Housing Department • Local Government Department • National Landscape Department • Solid Waste And Public Cleansing Management Cooperation • National Solid Waste Management Department
		National Policy on Environment	• For river basin management and related development projects, specific procedures for planning, including beneficial-use classification, coordination, and monitoring measures shall be incorporated to ensure sustainability.[12:2:1]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
	Target 5: Ensure	National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG)

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
	optimum water quality and yield		a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, encourage recycling as well as efficient and appropriate use. [12:1:2] • For river basin management and related development projects, specific procedures for planning, including beneficial-use classification, coordination, and monitoring measures shall be incorporated to ensure sustainability. [12:2:1] • In areas where intensive or extensive use of resources such as land, water and the marine environment is proposed, development planning shall be on a regional basis rather than on a project basis, taking into consideration both economic development and environmental protection objectives. [15:3:3]		• Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Consumer Policy	• Promoting sustainable use of the prudent spending, use of natural resources and facilities such as water and energy up to the prudent, and maintain the prosperity and welfare of the current generation of users and future generations.[2:5:3]	Ministry of Domestic Trade, Co-Operative And Consumerism	

KEY CORE AREA 2 : WATER RESOURCES SUSTAINABILITY				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Physical Plan	• Future water supply needs will also be safeguarded by conserving potential river and underground sources of water. [5:5:1] • All surface and ground water resources are strategic assets to be safeguarded and used optimally. [7:1:2] • The supply and projected demand for water by quantity and location should guide the planning of water resources areas.[7:11:1] • Ground water resources and recharge areas shall be identified and protected from activities that cause pollution and reduce yield. [7:12:1]	Ministry of Housing And Local Government	• Federal Department of Town And Country Planning Peninsular Malaysia • National Housing Department • Local Government Department • National Landscape Department • Solid Waste And Public Cleansing Management Cooperation • National Solid Waste Management Department

Table 2.3 - Profile Linking Key Core Area 3, Thrusts and Targets with Key Existing Policies and Relevant Stakeholder

KEY CORE AREA 3 : PARTNERSHIPS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 7 : Stakeholder Inclusivenes s and Engagement	Target 1 : Mechanisms for formal and informal consultation on matters related to water resources	National Policy on Climate Change	P4: Effective Participation Improve participation of stakeholders and major groups for effective implementation of climate change responses. [8:4] ST8-P4: Improve collaboration through efficient communication and coordination among all stakeholders for effective implementation of climate change responses. [7:4]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Policy on Environment	• Ensure the highest commitment to environmental protection and accountability by all decision-makers in the public and private sectors resource users, non-governmental organizations and the general public' in formulating planning and implementing their activities [5:7]		
		National Green Technology Policy	• Establishment of strong linkages between local research institutions and regional and international centres excellence in Green Technology RDI [17:4] • Effective involvement of media, non-governmental organizations and individual stakeholders in promoting Green Technology [18:5] • Strengthening the understanding of local players in Green Technology industries and their value chain, including the supporting industries through various industries enhancement programmes [15:2]	Ministry of Energy, Green Technology and Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembetungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)

KEY CORE AREA 3 : PARTNERSHIPS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 8 : Shared Water Resources Governance	Target 2 : Stakeholder collaboration in water resources governance	National Climate Change Policy	KA3 - ST1 Establish an inter-ministerial and cross-sectoral committee to enable the implementation of climate change measures. [8:3] KA5 - ST2 Incorporate and facilitate implementation of climate- friendly measures and technologies by strengthening the following: • Laws and regulations and Enforcement; • Human resource development • Finance and incentives; • Research and development; • Transfer of technology; and • Outreach to relevant stakeholders. [9:2]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Park Malaysia (JLTM)
		National Policy on Environment	• Participate actively and effectively in regional and global efforts towards environmental conservation and enhancement [5:8]		

Table 2.4 - Profile Linking Key Core Area 4, Thrusts and Targets with Key Existing Policies and Relevant Stakeholder

KEY CORE AREA 4 : CAPACITY BUILDING AND AWARENESS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
Thrust 9 : Capacity Building	Target 1 : Build capacity of key water resources stakeholders	National Green Technology Policy	• The establishment of the Ministry of Energy, Green Technology and Water reflects Malaysia's seriousness in driving the message that 'clean and green' is the way forward towards creating an economy that is based on sustainable solutions. [3:4:3]	Ministry of Energy, Green Technology and Water	• Jabatan Bekalan Air (JBA) • Jabatan Perkhidmatan Pembetungan • Suruhanjaya Perkhidmatan Air Negara (SPAN)
		National Policy Environment	• Participate actively and effectively in regional and global efforts towards environmental conservation and enhancement [5:8]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)
		National Forestry Policy	• To encourage an aggressive bumiputra participation in the field of wood-based industry in compliance with the government policy [7:2.2.6] • To promote active local community involvement in various contracts of the forestry development projects and to maintain their involvement in agro-forestry programmes [7:2.2.8]		
		National Mineral Policy 2	• A qualified, competent and productive workforce is pertinent for the advancement of the mineral industry [17:5]		

KEY CORE AREA 4 : CAPACITY BUILDING AND AWARENESS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Urbanisation Policy	• The local authority, as the main agency responsible for urban management, needs to update the administration and management system to optimize its financial revenue including new sources, upgrade its capacity to enable towns to become more competitive and viable, strengthen human resources by employing skilled and experienced staff as well as expand the use of technology [64:2:1] • Increase manpower at all levels of local authorities including additional technical staff for the management and professional group [84:2] • Expand services at the local authority level to enable job rotation, better promotion opportunities and exchange of officers amongst local authorities within the same state [84:4]	Ministry of Housing and Local Government	• Solid Waste and Public Cleansing Management Corporation • Federal Department of Town and Country Planning Peninsular Malaysia • National Landscape Department • Local Government Department • National Housing Department • National Solid Waste Management Department
		National Physical Plan	• There is a need to establish strong linkages with planning authorities at the state and local levels [128:6.2.3]	Ministry of Housing and Local Government	• Solid Waste and Public Cleansing Management Corporation • Federal Department of Town and Country Planning Peninsular Malaysia • National Landscape Department • Local Government Department • National Housing Department • National Solid Waste Management Department

KEY CORE AREA 4 : CAPACITY BUILDING AND AWARENESS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		Third National Agricultural Policy	• Joint ventures between local and foreign private sector will be promoted under the Indonesia-Malaysia-Thailand Growth Triangle (IMTGT),Brunei-Indonesia-Malaysia-Philippine-East ASEAN Growth Area (BIMPEAGA) and the Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT) to engage in distant water fishing.[8:1:14] • To improve efficiency and effectiveness of water resource management and utilisation for agriculture, the following initiatives will be undertaken by the Government: - strengthening the coordination and linkages of inter agency, interstate and federal state institutions in water resources management.[19:2:1]	Ministry of Agriculture and Agro-Based	• Department of Agriculture • Department of Fisheries • Department of Veterinary Services
	Target 2: Improve understanding and awareness on the importance of water resources security and sustainability	National Policy On Biological Diversity	• The network of protected areas on land, as of 1992, includes 2.12 million hectares of National and State Another 4.43 million hectares of natural forest within the Permanent Forest Estate of 14.28 million hectares are protected as water catchment areas. [10:7:4] • By the end of 1994, the surrounding marine waters of 38 offshore islands in Peninsular Malaysia and Labuan had been gazetted as marine parks. In addition, one national park in Sarawak, three in Sabah and one state park in Terengganu protect coastal and marine ecosystem.[10:8:1]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage (DID or JPS in Malay) • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

KEY CORE AREA 4 : CAPACITY BUILDING AND AWARENESS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
			• These conservation efforts are inadequate for a number of reasons: i)Several important habitats are under-represented. For example, wetlands such as mangrove forests, peat swamps and freshwater swamps are not adequately protected. ii)there is little emphasis on the conservation of individual species of plants, insects or fish (marine and freshwater). iv)The establishment of marine parks in Peninsular Malaysia focuses on aquatic considerations. Additional attention must be accorded to the adjoining terrestrial components as these too, if unduly disturbed, will have negative impacts on the marine ecosystem. v)Common marine and terrestrial biological resources (e.g. in transboundary areas) lack adequate regional and international cooperation in their conservation and management.[10:1:2]		•
		The National Urbanization Policy	• Ensure that urban development is given emphasis to reduce air, noise and water pollution and is compatible with rivers.[63:2:7]	Ministry of Housing and Local Government	• Solid Waste and Public Cleansing Management Corporation • Federal Department of Town and Country Planning Peninsular Malaysia • National Landscape Department • Local Government Department • National Housing Department • National Solid Waste Management Department

KEY CORE AREA 4 : CAPACITY BUILDING AND AWARENESS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Physical Plan	• Future water supply needs will also be safeguarded by conserving potential river and underground sources of water.[5:5:1] • All surface and ground water resources are strategic assets to be safeguarded and used optimally.[7:11:1] • The supply and projected demand for water by quantity and location should guide the planning of water resources areas.[7:12:1]	Ministry of Housing and Local Government	• Solid Waste and Public Cleansing Management Corporation • Federal Department of Town and Country Planning Peninsular Malaysia • National Landscape Department • Local Government Department • National Housing Department • National Solid Waste Management Department
		National Solid Waste Managemen t Policy	• On 1 July 1999, SWMSB upgraded the Ulu Tiram landfill to accommodate an increase in waste input from 250 tonne/day to 1,000 tonne/day. The landfill is operated by cells with leachate pipes and pond, storm water drainage, fencing and liner. It is a secured area with no scavenging activities. [6:10:3]	Ministry of Housing and Local Government	• Solid Waste and Public Cleansing Management Corporation • Federal Department of Town and Country Planning Peninsular Malaysia • National Landscape Department • Local Government Department • National Housing Department • National Solid Waste Management Department

KEY CORE AREA 4 : CAPACITY BUILDING AND AWARENESS				Note: Reference: [a:b:c] refers to: a : page b : paragraph c : line	
THRUST	**TARGET**	**RELATED POLICY**	**NOTES**	**MINISTRY**	**RELATED AGENCIES**
		National Policy on Environment	• A systematic and comprehensive inventory of existing and potential water resources, including groundwater, will be developed, and a long-term national plan for water management and protection shall be prepared to prevent wastage, abate pollution, encourage recycling as well as efficient and appropriate use.[12:1:2]	Ministry of Natural Resources And Environment	• Department of Environment • Jabatan Minerals dan Geosains (JMG) • Department of Director General of Lands And Mines • Forestry Department Peninsular Malaysia (JPSM) • Department of Survey And Mapping • Department of Wildlife And National Parks (PERHILITAN) • Department of Irrigation and Drainage • Institut Tanah dan Ukur Negara (National Land And Survey Institute) (INSTUN) • Forest Research Institute of Malaysia • National Hydraulic Research Institute (NAHRIM) • Department of Marine Parks Malaysia (JLTM)

Based on the above the proposed draft policy is appended for consideration. The presentation has been modified to facilitate easier reading and cross-referencing; taking into account that aspects related to layout can be determined once the content has been approved. This proposed draft has been tabled for discussion at several consultative platforms. The Draft NWR Poicy is appended and marked as **Annex 2.4.**

2.7 REVISION TO THE PROPOSED DRAFT NWR POLICY

After the submission of the Draft Final Report, a committee was instituted to serve as a Peer Review Panel to look through the proposed draft NWR Policy, and provide inputs. Subsequent to two sittings, a series of recommendations were made, and the initial draft policy (as per **Annex 2.4**) was subsequent amended, departing from the present format and structure adopted by the MoNRE for the policies that are presently in place.

Two sessions were held with the panel. At the first session (it is worth noting here that the members were only given the study terms of reference and a copy of the Draft NWR Policy, as per **Annex 2.4** with one principle removed), the members felt that an extended introduction would better serve to aid the implementers. In addition recommendations were made for the proposed objectives to be split and strengthened, to solidify the governments stand and position in making action for water resources sustainability and security a national priority. Written feedbacks were then forwarded (see **Annex 2.5**) and based on the first set of feedbacks, a revised draft NWR Policy was prepared, the objectives as well as principles were revised, in addition to incorporation of inputs in its entirety as far as it was possible.

At the second session, a run through of the revised draft was made, including the update on feedbacks incorporated. The members then deliberated on the revised draft, and but comments were received in entirety post the Technical Committee meeting, thus members of the Technical Committee were not able to view recommendation nor comment on the revised Draft NWR Policy. The second series of recommendations received however were in essence diverse in nature, and it was unfortunate that a session was not able to be held to facilitate clarification. Thus not all recommendations were incorporated in the draft that is appended in **Annex 2.6**, based on the following three main reasons:

(i) The recommendations were given separately, and in the initial rewrite, the Consultant incorporated as much as possible. Posts to the second draft, the subsequent set of recommendations again was divergent. Given the time frame, it was not possible to reconcile, and it would be presumptuous of the Consultant to select which to be incorporated or not, as there was no opportunity for clarification or direction as to which should be considered or otherwise.

(ii) Noted also were recommendations to actually expand the scope and nature of the draft NWR Policy elevating it to encompass water in its entirety, valid and critical as it is, it was not within the terms of reference given, and would require considerable work to rewrite and produce a draft to encompass all matters water related.

(iii) Part of the recommendations touched on format and style, which again, the feedbacks differed from member to member. It would have been impossible to

reconcile this without a consultation with the members, in additions to a session for a sit in rewrite with the Consultant; and

(iv) A subsequent rewrite would not have had the benefit of a consultation with key stakeholders of JPS, particularly those who were members of the Technical Committee, to consider further constitutional issues, particularly with regard to expanding the scope and structure of the draft as well as putting forth policy directions that were specific to state matters, extending beyond the executive reach of the Federal government.

Given the circumstances, a meeting was held on the 14th March 2011, chaired by Tuan Haji Hanapi, and the Consultants were directed to make several changes, taking into account the feedback received. This included revising the text in relation to context as well as streamlining the policy statement, all of which were done, and the revised document post the 14th March meeting is appended in **Annex 2.6**.

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
AUGUST 2011

Annex 2.1 - Worksheet 1: Justification for Framing NWRP

ANNEX 2.1 – WORKSHEET 1: JUSTIFICATION FOR FRAMING NWRP

Justification for Policy	Policy type	Key guiding principles	Key issues as tabled and raised at workshop	Policy thrust areas/ Cluster	Reactive Policy Strategies	Proactive Policy Strategies	TO DO LIST
FROM WORKSHOP 1. Provide basis to introduce uniformity § Use of terms § Coverage 2. Provide basis to develop comprehensive information on, about and for water	Decision to be made on: A. Content Structure: Substantive and/ or Administrative Substantive matters- management of subject matters – legislations, programmes and practices: OR Administrative / procedural: Means, methods and measures B. Policy structure/ frame: *Vertical policy* – confined to one/ singular entity and technical bodies within with singular goal or focused set objective within mandate OR [redacted] – cross cutting with multiple objectives (collaborative in nature – multiple deliveries and targets)	VISION Present set of vision statements: ▪ *Water for people*: all have access to safe, adequate and affordable water supply, hygiene and sanitation. ▪ *Water for food and rural development*: provision of sufficient water that will ensure national food security and promote rural development. ▪ *Water for economic development*: provision of sufficient water to spur and sustain economic growth within the context of a knowledge-based economy and e-commerce. ▪ *Water for the environment*: protection of the water environment to preserve water resources (both surface water and groundwater) and natural flow regimes, bio-diversity and the cultural heritage, along with mitigation of water-related hazards. Need to determine: REVISIT?	The following issues were raised for consideration in terms of setting policy directions: 1. Clarify and consolidate use of terms related to: Water types: • Natural • Artificial – recovered grey water • Manmade – cloud seeding? Additional points to note: • Boundary- issues related to demarcation and gazettement • Artificial- treated waste water to be termed as a water resource – policy direction as to whether the govt. will treat treated water as a water resource. Consider grey water as water resources. Water bodies • Natural and manmade: • Surface – rivers, lakes, ponds, wetlands • Sub-surface – crust to core Scope For marine/coastal waters, consider: • State waters – 3nm/5km • National waters – 12km • International waters - <200km	INFORMATION			To do still: 1. Select desired objective based on agreed goals 2. Identify targets, target groups 3. Identifying pathways (reactive or proactive) 4. Identifying specific measure and means including programmes 5. Implementation measures 6. Indicators to measure output/ outcome/ Impact
				USE OF TERMS	▪ Clarify ▪ Categorise	▪ Invest in research build comprehensive information ▪ Invest in research to clarify, contextualise and categorise 'alternative water resources' ▪ Determine 'water'; water bodies; types of water usage ▪ Establish funding mechanism	
				CONTEXT	Qualify context for water Identify – needs assessments and suitability for alternative waters (acceptability)		
				DETERMINATION AND CATEGORISTION	Options for alternative water resources		
		Principles: Four were looked at: 1. Sustainability – consider holistic approaches 2. Self dependency – State to become self dependent instead of depending on other states 3. Resource Security – look at risk management and national security issues 4. Partnerships – looking at possibilities of it being: ▪ Guided by law ▪ Focused on uniformity and standardisation of methods and practice ▪ A means to establish coordination and cooperation of various water users and water	1. Strengthen water intelligence so as ensure there is: • Comprehensive information of resources – type, location, state and condition • Information to better resolve issues related to water resources planning • Information that will ensure that there is a back up mechanisms – small treatment plants in the event of disruption • Information to develop contingency plans • Avoidance of land use incompatibility through adherence of gazzetted physical plans (local, state and national physical plans) • Securing water reservoirs or highly sensitive water storage areas or catchment areas with additional protection (in terms of war and threats) (extend provisions of protection both surface and subsurface)	COMPREHENSIVE INFORMATION	▪ Identify key agencies for data and information collection, management and provisioning ▪ Develop data, methods for data and information management, provisioning ▪ Categorise information, determine accessibility ▪ Develop mechanisms for determining information veracity and verification		

Justification for Policy	Policy type	Key guiding principles	Key issues as tabled and raised at workshop	Policy thrust areas/ Cluster	Reactive Policy Strategies	Proactive Policy Strategies	TO DO LIST
				VALUE/ VALUATION			
			2. Recognise that water is finite, despite its apparent abundance	Water resources economics	▪ Identify options for putting in place measures to determine the value of water resources, raw, recycled, recovered and alternative sources ▪ Develop water resources pricing mechanisms ▪ Determine options to reconcile water demand and availability, taking into account prioritisation and localised conditions and priorities ▪ Develop measures and mechanisms for water resources (by users?) audits ▪ Determine pricing mechanisms to address wastage ▪ Determine infrastructure costs and financing needs ▪ Determine incentives and disincentives	▪ Invest in research ▪ Build expertise – water assessors and auditors ▪ Determine best approaches ▪ Determine best economic approaches and practices as well as incentive and disincentive mechanism	
			3. Address multiple demand, uses and users, taking into account:: ▪ Competing water uses and users ▪ Issues of value of water				
			4. In relation to allocation prioritisation, consideration should be made in respect of state/local/specific site conditions and priorities as well as development needs	Water demand management			
			5. Address wastage and efficiency taking into consideration: • Economic value of raw water, noting that there is a need to establish mechanisms to better price raw water • Control demand with appropriate pricing • Charge 'effluents' (from all sources) • With regard to excess waters – reconcile the use of excess waters • Improve infrastructure (losses at pipelines) • Reuse of water – recycled water ('fourth tap') • Awareness and education • Self regulation (all sectors) • Incentives for conserving water/ reducing wastage				
			8. Introduce water audits to improve management of water resources				
				PROTECTION AND CONSERVATION			
			12. Human rights, health, safety and security ▪ Introduce fundamental rights to safe water and control of manipulation of water for commercial/business purposes ▪ Access to safe water ▪ Maintenance of storage facilities and (infrastructure) distribution of supply Access to water during disruption, crisis and drought incidences				
			6. Address threats, reduce threats and rehabilitate degraded resources				
			7. Address aspects related to yield, recharge, recovery and recycling of water • Reuse and recycling • Recharge and discharge • Storage of excess water – e.g. flood water • Rain water harvesting				
			11. Address transboundary factors – international, interstate				
			13. Environmental sustainability and ecosystems integrity ▪ Look at land use ▪ Catchment gazzettement ▪ Catchment management plan Sensitive areas (catchment, buffers, reservoirs)				

Justification for Policy	Policy type	Key guiding principles	Key issues as tabled and raised at workshop	Policy thrust areas/ Cluster	Reactive Policy Strategies	Proactive Policy Strategies	TO DO LIST
			16. Maintenance of hydrological cycles, taking into accounts aspects such as reducing development of impermeable surfaces – promote more 'green' and catchment opportunities areas				
			14. Give consideration to hazards and disasters				
			15. Consider role of water in aiding adaptation to climate change				
			17. Relook at physical development / urban planning				
				CAPACITY BUILDING AND AWARENESS			
			9. Raise more awareness; make water everybody's business, with emphasis of the link between water and environment, so as to ensure that the resource is better valued.				

Annex 2.2 – Excerpt of Draft Checklist of Ministries, Policies and Laws Relevant for Policy Framing

ANNEX 2.2 - EXCERPT OF DRAFT CHECKLIST OF MINISTRIES, POLICIES AND LAWS RELEVANT FOR POLICY FRAMING. (UNEDITED RAW TEMPLATE OF PROFILING EXERCISE)

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
INFORMATION ▪ Centralise information collection and management ▪ Consolidate available information ▪ Establish comprehensive system ▪ Uniform methods and measures for information provisioning and management	**Core Area 1**	**Water Resources Security**			
	Thrust 1	**Water intelligence**			
	Strategy 1	1) Develop a comprehensive information system on, about and for water resources	National Policy on Environment National Biodiversity Policy National Minerals Policy National Forestry Policy National Policy on Climate Change	Ministry of Natural Resources & Environment (NRE) Department of Environment Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia Department of Irrigation and Drainage Malaysia Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department Peninsular Malaysia Department of Marine Park Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM)	Ministerial Functions Act 1969 National Land Code 1965 Environmental Quality Act 1974 National Forestry Act 1984 Geological Survey Act 1974 Exclusive Economic Zone Act, 1984 Custom Duties (Amendment) (No.35) Order 1989 (made under the Customs Act 1967) Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999 Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001[P.U. (A) 35/2001] Biosafety Act 2007 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Institut Tanah dan Ukur Negara (INSTUN)	Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985 Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76] International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226] Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Exclusive Economic Zone Act 1994 Fisheries Act 1985
			National Green Technology Policy	Ministry of Energy, Green Technology and Water	Ministerial Functions Act 1969 Energy Commission Act 2001

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Energy Commission Tenaga Nasional Berhad (TNB) Sabah Electricity Sdn. Bhd. (SESB) Sarawak Electricity Supply Corp. (SESCo) GreenTech Malaysia formerly known as Pusat Tenaga Malaysia (PTM) National Water Services Commission (SPAN) Sewerage Services Department (JPP) Water Supply Department (JBA)	Electricity Supply Act 1990 Electricity Supply (Successor Company) Act 1990 Lembaga Letrik Sabah Act 1983 Communications and Multimedia Act 1998 Malaysian Communications And Multimedia Commission Act 1998 Water Services Industry Act 2006 Suruhanjaya Perkhidmatan Air Negara Act 2006
			National Physical Plan	Ministry of Housing and Local Government Department of Town and Country Planning Fire and Rescue Department Malaysia Local Government Department National Landscape Department National Housing Department National Solid Waste Management Department (NSWMD) Tribunal for Homebuyers Claim	Town and Country Planning Act 1976 Housing Development (Control and Licensing) Act 1966 Fire Services Act 1988 Local Government Act 1976 Street, Drainage and Building Act 1974 Town Planners Act 1995 Building and Common Property (Maintenance and Management) Act 2007 Solid Waste and Public Cleansing Management Act 2007 Building and Common Property (Maintenance and Management) Act 2007

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Housing and Local Government Training Institution	Food Act 1983 (Act 281) Petroleum (Safety Measures) Act 1984 (Act 302) Prevention and Control of Infectious Diseases Act 1988 (Act 342) Destruction of Disease-Bearing Insects Act 1975 (Act 154) Strata Titles Act 1985 (Act 318) Strata Titles Act (Amendment) 1990 (Act A753) Environmental Quality Act 1974 (Act127) Housing Development (Control and Licensing) Regulations Act 1989 State Grants (Maintenance of Local Authorities) Act 1981 (Act 245) Pesticides Act 1974 (Act 149) Occupational Safety and Health Act 1994 (Act 514) Customs Act 1967 (Act 23) Federal Territory (Planning) Act 1982 (Act 267) Uniform Building By-laws 1984 National Landscape Guidelines
			National Policy on Environment	Ministry of Natural Resources & Environment (NRE)	Ministerial Functions Act 1969

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
			National Biodiversity Policy National Minerals Policy National Forestry Policy National Policy on Climate Change National Land Policy	Department of Environment Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia Department of Irrigation and Drainage Malaysia Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department Peninsular Malaysia Department of Marine Park Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM) Institut Tanah dan Ukur Negara (INSTUN)	National Land Code 1965 Environmental Quality Act 1974 National Forestry Act 1984 Geological Survey Act 1974 Exclusive Economic Zone Act, 1984 Custom Duties (Amendment) (No.35) Order 1989 (made under the Customs Act 1967) Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999 Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001[P.U. (A) 35/2001] Biosafety Act 2007 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960 Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
					Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76] International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226] Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Exclusive Economic Zone Act 1994 Fisheries Act 1985
		2) Strengthen processes and procedures related to information and knowledge generation	The Third National Agricultural Policy	Ministry of Agriculture & Agro-based Industry Department of Agriculture Department of Fisheries	Pesticides Act 1974 Plant Quarantine Act 1976 Control Of Padi And Rice Act 1994 New Plant Variety Protection 2004 Fisheries Act 1985

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Department of Veterinary Services Malaysian Agricultural Research and Development Institute (MARDI) ederal Agricultural Marketing Authority (FAMA) Fisheries Development Authority of Malaysia (LKIM) Farmers' Organisation Authority (FOA) Agrobank Muda Agricultural Development Authority (MADA) Kemubu Agriculture Development Authorithy (KADA) Malaysian Pineapple Industry Board (MPIB) TEKUN Nasional (Tabung Ekonomi Kumpulan Usaha Niaga)	Veterinary Surgeons Act 1974 Animal Act 1953 Abattoirs (Privatization) Act 1993 Fishermen's Association Act 1971 Malaysian Agricultural Research And Development Institute Act (MARDI) 1969 Federal Agricultural Marketing Authority Act (FAMA) 1965 Lembaga Kemajuan Ikan Malaysia Act (LKIM) 1971 Farmer's Organisation Authority Act 1973 Muda Agricultural Development Authority Act (MADA) 1972 Kemubu Agricultural Development Authority Act (KADA) 1972 Pineapple Industry Act 1957
		3) Consolidate means and methods for information collection, provisioning and cataloguing	National Policy on Environment National Biodiversity Policy National Minerals Policy National Forestry Policy National Policy on Climate Change	Ministry of Natural Resources & Environment (NRE) Department of Environment Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia	Ministerial Functions Act 1969 Environmental Quality Act 1974 Exclusive Economic Zone Act, 1984 Custom Duties (Amendment) (No.35) Order 1989 (made under the Customs Act 1967)

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
		4) Make provisions to include local and traditional knowledge	National Biodiversity Policy1998 National Forestry Policy	Department of Irrigation and Drainage Malaysia Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department, Peninsular Malaysia Department of Marine Parks Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM) Institut Tanah dan Ukur Negara (INSTUN)	Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999 Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001[P.U. (A) 35/2001] Biosafety Act 2007 National Land Code 1965 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960 Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985 Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Geological Survey Act 1974 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76]

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
					International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226] Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Exclusive Economic Zone Act 1994 Fisheries Act 1985
	Strategy 2	Strengthen database framework, software support, roster of trained experts	National Green Technology Policy	Ministry of Energy, Green Technology and Water Energy Commission PETRONAS Tenaga Nasional Berhad (TNB) Sabah Electricity Sdn. Bhd. (SESB) Sarawak Electricity Supply Corp. (SESCo) GreenTech Malaysia formerly known as Pusat Tenaga Malaysia (PTM) TNB Research Sdn. Bhd. SIRIM Bhd. (SIRIM) National Water Services Commission (SPAN)	Ministerial Functions Act 1969 Energy Commission Act 2001 Electricity Supply Act 1990 Electricity Supply (Successor Company) Act 1990 Lembaga Letrik Sabah Act 1983 Communications and Multimedia Act 1998 Malaysian Communications And MultimediaCommission Act 1998 Computer Crimes Act 1998 Digital Signature Act 1997

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Sewerage Services Department (JPP) Water Supply Department (JBA)	Copyright Act 1987 Water Services Industry Act 2006 Suruhanjaya Perkhidmatan Air Negara Act 2006
			National Policy on Environment National Biodiversity Policy National Minerals Policy National Forestry Policy National Policy on Climate Change	Ministry of Natural Resources & Environment (NRE) Department of Environment Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia Department of Irrigation and Drainage Malaysia Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department Peninsular Malaysia Department of Marine Park Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM)	Ministerial Functions Act 1969 Environmental Quality Act 1974 Exclusive Economic Zone Act, 1984 Custom Duties (Amendment) (No.35) Order 1989 (made under the Customs Act 1967) Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999 Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001IP.U. (A) 35/2001] National Land Code 1965 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960 Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Institut Tanah dan Ukur Negara (INSTUN)	Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Geological Survey Act 1974 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76] International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226] Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Exclusive Economic Zone Act 1994 Fisheries Act 1985
		2) Establish process for information provisioning, collection, cataloguing and	National Green Technology Policy	Ministry of Energy, Green Technology and Water Energy Commission PETRONAS	Ministerial Functions Act 1969 Energy Commission Act 2001 Electricity Supply Act 1990

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
		management		Tenaga Nasional Berhad (TNB) Sabah Electricity Sdn. Bhd. (SESB) Sarawak Electricity Supply Corp. (SESCo) GreenTech Malaysia formerly known as Pusat Tenaga Malaysia (PTM) TNB Research Sdn. Bhd. Petronas Research Scientific Services Sdn. Bhd. (PRSS) SIRIM Bhd. (SIRIM) National Water Services Commission (SPAN) Sewerage Services Department (JPP) Water Supply Department (JBA)	Electricity Supply (Successor Company) Act 1990 Lembaga Letrik Sabah Act 1983 Communications and Multimedia Act 1998 Malaysian Communications And Multimedia Commission Act 1998 Computer Crimes Act 1998 Digital Signature Act 1997 Copyright Act 1987 Water Services Industry Act 2006 Suruhanjaya Perkhidmatan Air Negara Act 2006
			National Policy on Environment National Biodiversity Policy National Minerals Policy National Forestry Policy National Policy on Climate Change	Ministry of Natural Resources & Environment (NRE) Department of Environment Department of Biosafety Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia Department of Irrigation and Drainage Malaysia	Environmental Quality Act 1974 Exclusive Economic Zone Act, 1984 Custom Duties (Amendment) (No.35) Order 1989 (made under the Customs Act 1967) Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department Peninsular Malaysia Department of Marine Park Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM) Institut Tanah dan Ukur Negara (INSTUN)	Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001[P.U. (A) 35/2001] Biosafety Act 2007 National Land Code 1965 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960 Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985 Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Geological Survey Act 1974 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76] International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226]

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
					Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Exclusive Economic Zone Act 1994 Fisheries Act 1985
		3) Establish communication framework between key stakeholders	The Third National Agricultural Policy	Ministry of Agriculture & Agro-based Industry Department of Agriculture Department of Fisheries Department of Veterinary Services Malaysian Agricultural Research and Development Institute (MARDI) Federal Agricultural Marketing Authority (FAMA) Fisheries Development Authority of Malaysia (LKIM) Farmers' Organisation Authority (FOA) Agrobank Muda Agricultural Development Authority (MADA)	Pesticides Act 1974 Plant Quarantine Act 1976 Control Of Padi And Rice Act 1994 New Plant Variety Protection 2004 Fisheries Act 1985 Veterinary Surgeons Act 1974 Animal Act 1953 Abattoirs (Privatization) Act 1993 Fishermen's Association Act 1971 Malaysian Agricultural Research And Development Institute Act (MARDI) 1969 Federal Agricultural Marketing Authority Act (FAMA) 1965 Lembaga Kemajuan Ikan Malaysia Act (LKIM) 1971

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Kemubu Agriculture Development Authorithy (KADA) Malaysian Pineapple Industry Board (MPIB) TEKUN Nasional (Tabung Ekonomi Kumpulan Usaha Niaga)	Farmer's Organisation Authority Act 1973 Bank Pertanian Malaysia Berhad Act 2008 Muda Agricultural Development Authority Act (MADA) 1972 Kemubu Agricultural Development Authority Act (KADA) 1972 Pineapple Industry Act 1957
	Strategy 3	Improve and shift towards standardization of multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources	National Green Technolog Policy	Ministry of Energy, Green Technology and Water Energy Commission PETRONAS Tenaga Nasional Berhad (TNB) Sabah Electricity Sdn. Bhd. (SESB) Sarawak Electricity Supply Corp. (SESCo) GreenTech Malaysia formerly known as Pusat Tenaga Malaysia (PTM) TNB Research Sdn. Bhd. Petronas Reserch Scientific Services Sdn. Bhd. (PRSS) SIRIM Bhd. (SIRIM) National Water Services Commission (SPAN) Sewerage Services Department (JPP)	Ministerial Functions Act 1969 Energy Commission Act 2001 Electricity Supply Act 1990 Electricity Supply (Successor Company) Act 1990 Lembaga Letrik Sabah Act 1983 Communications and Multimedia Act 1998 Malaysian Communications And Multimedia Commission Act 1998 Computer Crimes Act 1998 Digital Signature Act 1997 Copyright Act 1987 Water Services Industry Act 2006 Suruhanjaya Perkhidmatan Air Negara Act 2006

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				Water Supply Department (JBA)	
			National Policy on Environment National Biodiversity Policy National Minerals Policy National Forestry Policy National Policy on Climate Change	Ministry of Natural Resources & Environment (NRE) Department of Environment Department of Biosafety Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia Department of Irrigation and Drainage Malaysia Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department Peninsular Malaysia Department of Marine Park Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM) Institut Tanah dan Ukur Negara (INSTUN)	Environmental Quality Act 1974 Exclusive Economic Zone Act, 1984 Custom Duties (Amendment) (No.35) Order 1989 (made under the Customs Act 1967) Customs (Prohibition of Import) Order 1998, (Amendment) 2006, P.U.(A)434 Customs (Prohibition of Export) Order 1998, (Amendment) 2006, P.U.(A)433 Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999 Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001[P.U. (A) 35/2001] National Land Code 1965 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960 Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
					Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Geological Survey Act 1974 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76] International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226] Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Exclusive Economic Zone Act 1994 Fisheries Act 1985
	Thrust 2	**Water Resources Integrity**			
	Strategy 4	Set national standards to determine thresholds for water	National Policy on Environment National Biodiversity Policy	Ministry of Natural Resources & Environment (NRE) Department of Environment	Environmental Quality Act 1974 Exclusive Economic Zone Act, 1984

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
		resources to protect resources, its availability and integrity of water bodies	National Minerals Policy National Forestry Policy National Policy on Climate Change	Department of Biosafety Department Of Director General Of Lands And Mines (Federal) Minerals and Geoscience Department Malaysia Department of Irrigation and Drainage Malaysia Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) Forestry Department Peninsular Malaysia Department of Marine Park Malaysia Department of Survey and Mapping Malaysia (JUPEM) National Hydraulic Research Institute of Malaysia (NAHRIM) Forest Research Institute Malaysia (FRIM) Institut Tanah dan Ukur Negara (INSTUN)	Sarawak Natural Resources and Environment (Prescribed Activities) Order 1994 Sabah Conservation of Environment (Prescribed Activities) Order 1999 Exclusive Economic Zone (Appointment of Authorized Officer) Order 2001[P.U. (A) 35/2001] National Land Code 1965 Land (Group Settlement Area) Act 1960 Land Conservation Act 1960 Small Estate Distribution Act 1955 Continental Shelf Act 1966 Strata Title Act 1985 Padi Cultivators (Control of Rent and Security of Tenure) Act 1967 Geological Survey Act 1974 Mineral Development Act 1994 Drainage Works Act 1954 Waters Act 1920 Licensed Land Surveyors Act 1958 Protection of Wildlife Act 1972 [Act 76]

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
					International Trade in Endangered Species Act 2008 National Parks Act 1980 [Act 226] Taman Negara (Pahang) Enactment 1939, No. 2 Taman Negara Terengganu Enactment 1939, No. 6 Taman Negara Kelantan Enactment 1938, No. 14 Fisheries Act 1985
			National Green Technology Policy	Ministry of Energy, Green Technology and Water Energy Commission PETRONAS Tenaga Nasional Berhad (TNB) Sabah Electricity Sdn. Bhd. (SESB) Sarawak Electricity Supply Corp. (SESCo) GreenTech Malaysia formerly known as Pusat Tenaga Malaysia (PTM) TNB Research Sdn. Bhd. Petronas Reserch Scientific Services Sdn. Bhd. (PRSS) SIRIM Bhd. (SIRIM)	Ministerial Functions Act 1969 Water Services Industry Act 2006 Suruhanjaya Perkhidmatan Air Negara Act 2006

GOAL	POLICY CORE AREAS, THRUST AND STRATEGIES		RELATED POLICY	Related Agencies	Preliminary List of Related Laws
				National Water Services Commission (SPAN) Sewerage Services Department (JPP) Water Supply Department (JBA)	

Annex 2.3 - Sample Worksheet 2: Policy Framing and Setting Exercise

ANNEX 2.3 – SAMPLE WORKSHEET 2: POLICY FRAMING AND SETTING EXERCISE

Overall Goal	Key Area(s)	Thrust(s)	Aspect(s)	Goal(s)	Objective(s)	Target(s) (timebound)	Target Group(s)	Strategies		Measures/ Programmes	Jurisdiction	'Implementer'	Cost / Financing	Policy complementarily
								Reactive	Proactive					
Water security Key word - *condition* (*asset and heritage of national interest) To cover: Threat (war, terrorism, subversive acts etc) Crisis (Hazards, Disaster, Contamination, Drought)	*Water intelligence* ▪ Water resources ▪ Water bodies ▪ Water catchments and sub-surface recharge area ▪ Impacts, Hazards and Disaster ▪ Threats and Risks	Water intelligence	Information	Comprehen-sive information on, about and for water resources	▪ Develop information and knowledge base ▪ Strengthen processes and procedures related to information and knowledge generation ▪ Consolidate information and means and methods for information collection, provisioning and cataloguing ▪ Reconcile means and measures						Federal – transboundary, national information and intelligence and State – State information			
			Database											
			Science and Practice											
		Water resources integrity	Water resources capacity	Set threshold	▪ Develop measures to determine yield/ capacity	▪ Develop yield targets	▪ Consumers: Domestic and Industry users							
			Water resources threshold	Standardise water quality standards	▪ Develop ▪ Reconcile		▪ Water users ▪ Water service providers							
		Catchment integrity	Control of impacts to water resources and its related hydrological and hydro-geological processes from Land and Physical Dev	Determine impact and stress factors Identify sensitive and critical areas for protection	Develop sensitive areas and critical areas data, information, characterisation, classification and maps									
					▪									
	"Securing water resources" Securing key water resource areas? Bodies? Securing critical water resources areas Too little, too much too polluted	▪ Alternative water resources	Contiguous use of water resources	Optimisa-tion of water resources including exercising alternative options (recycled) suited to particular uses	▪ Promote efficiency ▪ Reduce wastage			Review, enhance or develop procedures in times or threats and crisis (For Too little, too much too polluted)						
		▪ Hazard and Disaster mitigation						Develop strategies to avert or divert impacts from crisis/ hazards	Plans for strategic options for controlled 'flooding' (see China – diversion of flood waters and destruction of flood bunds in selected areas)					
		▪						Support systems	Infrastructural					
		▪						Back up systems	Conjunctive / contigous use					
	Resolving water related conflicts and competing uses	▪												

Overall Goal	Key Area(s)	Thrust(s)	Aspect(s)	Goal(s)	Objective(s)	Target(s) (timebound)	Target Group(s)	Strategies		Measures/ Programmes	Jurisdiction	'Implementer'	Cost / Financing	Policy complementarily
								Reactive	Proactive					
Water resources sustainability Key word – *availability* *(Catalyst for environment and development)*	Water resources governance and conservation (which includes both management and administrative aspects particularly processes and procedures)	▪ Conserve and Protect water resources and bodies, both natural and artificial ▪ Conserve and protect surface and groundwater	Availability of H20	Determine priority purpose	Identify key water use areas	Identify key measures to be used in determining priority					State / Federal if wholly within boundaries If shared – coordinative arrangements			
			Water bodies natural/artificial	Maintain condition and state of water body	Protect water bodies and surrounding areas	Ensure that water bodies are adequately protected		Develop conservation plan for water bodies to sustain the water bodies, inc, rehabilitation and improvement covering both the ecological systems and aesthetics		Develop ideal standards for particular water bodies				
										Develop integrated natural resource management plans that takes into account the principles of IWRM, ILM, ICM, IRBM, IFM,				
						Introduce water resources 'pricing'	Key resource service providers and users			Include water resources costs – conservation and recovery - in pricing	Federal: Overall method for water resources pricing based on resource type and local State: Application of method subject to local variables and condition and determination of pricing			
			Allocation priority	Determine priority use										
				Determine priority users										
			Demand management	Manage water resources based on demand priority and resource availability	Prioritise demand					Water resources management schemes				
					Prioritise allocation in times of crisis					Water resources crisis management				
			Maintenance of hydrological functions		Identification and isolation of water resources stress factors					Flow management				
			Water resources condition	Ensure optimum water quality	Maintain water quality for all water bodies									
				Ensure water resources quantity	Establish maximum levels for yield									
Partnerships														

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
AUGUST 2011

Annex 2.4 - Draft National Water Resources Policy - Draft Outline and Initial Framework

PROPOSED DRAFT AS DISTRIBUTED FOR TECHNICAL REVIEW

(Note: only changes made here are the insertion of a timeline for action as requested by the Economic Planning Unit from the Technical Review feedback and deletion of a principle)

NATIONAL WATER RESOURCES POLICY

DRAFT OUTLINE AND INITIAL FRAMEWORK

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Policy Principles

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Policy Core Area 1: Water Resources Security
Policy Core Area 2: Water Resources Sustainability
Policy Core Area 3: Partnerships
Policy Core Area 4: Capacity Building

Implementation Plan

PREAMBLE

Malaysia's water resource has been and will continue to be the catalyst for national development and fundamental element for nation wellbeing. It's value both extrinsic and intrinsic, demands that it be treated as both an asset and heritage of national importance not only does it serve the people, it has helped maintain the integrity of our environment, natural resources and ecological functions. It unitary nation, and an element that binds man and nature, in addition to its ability to be renewed and replenished has led it to being used unsustainably with increasing reports of its availability being affected by various factors, which more often than not are anthropogenic based. Despite its apparent abundance, there have been incidences of insufficiency, unavailability in addition to threats to the safety of the resource itself. As an element that makes up the Earth's natural resource, it is vulnerable to human and natural disasters and impacts. It is this fear that the sustainability of our water resources will be compromised and its availability threatened and its role as a life support undermined that has led the Ministry of Natural Resources and Environment Malaysia to take this crucial step to ensure that the sustainability of water resources, securing the same for the multiple needs and uses and paving the way for multi-stakeholder for better water resources governance. It is after all the mandate held by the Ministry of Natural Resources and Environment Malaysia that has led it to moot this initiative to formulate a policy that will set out means and measures to effect better water resources governance, albeit, taking into account with advancing science and growing corpus of knowledge, the plan of action set out will require it to be time bound so as to assure its relevancy and avoid it from being outdated.

This Policy recognises the steps taken by the Government since 1999 help ensure that water resources in Malaysia is conserved and managed to ensure adequate and safe water for the people and the environment. The establishment of the National Water Resources Council served as the means by which Federal and State government can come together to identify means and ways to address problems that plague or related to water resources. Water resource stakeholders in expressing their concern and need for better water resource management and conservation identified four key principles that should underpin government efforts, i.e.

- *Water for people*: all have access to safe, adequate and affordable water supply, hygiene and sanitation.

- *Water for food and rural development*: provision of sufficient water that will ensure national food security and promote rural development.

- *Water for economic development*: provision of sufficient water to spur and sustain economic growth within the context of a knowledge-based economy and e-commerce.

- *Water for the environment*: protection of the water environment to preserve water resources (both surface water and groundwater) and natural flow regimes, biodiversity and the cultural heritage, along with mitigation of water-related hazards.

It also takes cognisance of the various policy statements couched in a series of policies since the 1970's were put forth to help govern water resources in a more effective and efficient

manner, but the need to consolidate the direction and commitment requires a National policy document to ensure that strategies and actions are integrated, concerted as well as coordinated. This stems from the fact that water resources require collective action of both Federal and State governments. There is a need for direction that will help sustain and secure our water resources so as to ensure the well being of the nation is taken care of. This National Policy on water resources is mindful of the shared partnership that exists where water resource conservation and management is concerned and sets out commitments to help steer present and future actions towards sustainable use and development of the resource, which shall serve as the common goal shared by all who benefit from this precious resource.

POLICY STATEMENT

To ensure the sustainable use and development of water resources in Malaysia, water resources shall be treated as a national priority and the conservation and management of water resources shall be effected through a mechanism of shared partnership involving all stakeholders.

RATIONALE

This National Water Resources Policy shall set the strategic framework for action to ensure that water resources are used and developed in a sustainable manner to benefit the nation both people and environment as a whole, setting out strategies that will help guide the many water resources stakeholders to structure actions that will effect better conservation and management of water resources in an integrated, concerted and coordinated manner, bearing in mind that water resources may transcend traditional jurisdictional boundaries.

OBJECTIVES

The objectives of the NWPP are as follows:

1. To set direction to facilitate uniformed actions towards ensuring water resources security and sustainability.

2. To set out mechanisms and identify processes to facilitate concerted actions for water resources security and sustainability.

3. To establish mechanisms for partnership between multiple stakeholders and means for stakeholder engagement.

PRINCIPLES

- **Water Resources Security**

  Water resources is of primary national interest thus its security is paramount.

- **Water Resources Sustainability**

  Water resources is the catalyst for environment and development therefore it should be sustained for present and future uses and Federal and State Governments will look at optimising and minimising wastage of water resources. It also opens up the opportunity to bolster self-dependency of states, to not just rely on transfers but to shift towards exploring alternative sources, and address aspects related to demand management.

(*Note: After submission of this Draft report, the team was informed that following from a meeting with the Ministry of the Natural Resources and Environment, the YB Minister requested that the principle on partnership be removed.)

KEY CORE AREAS, THRUSTS, TARGETS, STRATEGIES, ACTION PLANS AND INDICATIVE INDICATORS:

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
1.Secure Water Resource	1. Water Intelligence	1. Develop a comprehensive information system on, about and for water resources	1. Consolidate existing scientific and technical data	1. Identify existing scientific and technical data available related to water, water resources, use and users	S	1. Number and types of data
				2. Identify repository and repository holders	S	2. Number of repositories
				3. Establish mechanisms to resolve issues relating to copyrights	M	3. Number of processes instituted to resolve disputes
			2. Develop system for continuous analysis or synthesis of scientific and technical data	4. Establish method to analyse and synthesise scientific and technical data	S/M	4. Number of methods developed/ reconciled
		2. Strengthen database framework, software support, roster of trained experts	3. Create database framework and establish information networks	5. Review existing database framework – revision to scope and coverage	S	5. List of database
				6. Establish process for information provisioning, collection, cataloguing and management	S/M	6. Number of processes
			4. Establish communication framework between key stakeholders	7. Develop profile of stakeholders and existing information database	S	7. List and number of stakeholders
				8. Establish mechanisms for sharing of information and access between stakeholders	S	8. Number of mechanisms set up
		3. Improve and shift towards standardization of multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources	5. Introduce uniformity in the practice related to water resources evaluation and analysis	9. Standardise existing and develop criteria for water resources state, status and condition evaluation and analysis based on strict and rigorous scientific methods and approaches	S/M	9. List and numbers 10. Number of criteria standardised
	2. Water Resources Integrity	4. Set national standards to determine thresholds for water resources to protect resources, its availability and integrity of water bodies	6. Improve and develop measures to determine threshold and yield of water resources and integrity of water resources bodies	10. Profile methods and measures used to determine threshold and yield	S	11. Number of methods

1 S indicates short term, spanning a period of 1-3 years; M indicates medium term, spanning a period of 3-5 years; L indicates long term, spanning a period of 5-10 years.

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
				11. Develop system to consolidate information to establish national standards and perimeters for setting threshold and yield levels for different water resources types and water resources bodies	M/L	12. System existence
			7. Develop national water resources related standards (e.g. quality, volume and water body health)	12. Review, revise and reconcile current standards for determining integrity and health of water resources	S/M	13. Number of reconciliation processes 14. Outputs
		5. Reduce vulnerability of water resources to impacts and threats as well as strengthen adaptability to ecosystems and physical changes	8. Identify threats, impacts and hazards that affect water resource and bodies including threats, hazards and impacts ensuing from water bodies	13. Identify options and measures to reduce, mitigate and remove stress, threats, impacts and risks including transboundary risks, threats, impacts and hazard events	S	15. List of options
				14. Identify existing and emerging threats to and from water resources as well as water bodies	S	16. List of threats
				15. Determine measures to aid adaptation of water resources to threats and emerging threats e.g. climate change, disasters	S/M	17. List of measures
				16. Identify and develop water resources cor	S	18. List and number of plans according to area
				17. Identify options for ensuring resiliency of water resources from stress,	S/M	19. List of options
		6. Develop water resources conservation plans for strategic, sensitive and critical water resources areas and bodies	9. Determine resiliency of water bodies and areas to stress, risks, impacts and hazard events	18. Profile characteristics and nature of stress, risks, threats and hazards	S	20. Number of profiles
				19. Identify water resources conservation options, targets and action plans	S	21. List of options, and targets 22. Number of action plans
				20. Determine levels and classifications of sensitivity and delineate sensitive areas and zones	S/M	23. Number of areas or zones classified
			10. Determine adaptability potential to assess viability of controlled	21. Profile measures to aid adaptability	S	24. List of measures

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
			development in areas earmarked or neighbouring developed areas	22. Develop water resources sensitivity database and maps	S/M/L	25. Number of maps and databases
				23. Incorporate data related to sensitivity in physical and national development planning processes, including for evaluation, review and assessment of development programmes and projects	M/L	26. List or number of data or information incorporated 27. Number of plans or programmes or projects with incorporated data or information
	3. Alternative Options for Water Resources Use	7. Explore options for alternative, conjunctive or contiguous of water resources	11. Optimisation of water resources use	24. Identify alternative or conjunctive water resources options and suitability of use	M	28. List of options 29. Suitability rankings
			12. Promotion of efficient and reduce dependency on stressed water resources	25. Review, enhance or develop plans and procedures to address stressed water resources in times of threats or crisis	M/L	30. Number or reviewed plans or procedures
	4. Disaster Risk Preparedness and Response	8. Strengthen measures for preparedness and response as well as reduction of risks and threats from disasters	13. Adopt clear scientific assessments procedures for risk, threat and hazard determination, as well as preparedness and response needs	26. Identify potential disaster events	S/M	31. List of events
				27. Identify areas and scale of potential impacts and risks	S/M	32. List and number of areas
				28. Develop risk assessment procedures	S/M	33. List of procedures
			14. Develop response and preparedness plans for water resources protection and alternative water resources	29. Identify alternative water resources to supplant affected water resources	S-L	34. List of alternative sources
2.Sustain Water Resources	5. Promote Consistent Application of Criteria & Characterization of Water Resources	9. Establish uniformed measure and guidelines	15. Establish national water resources standards and guideline	30. Establish uniform use of terms to characterise water resources	S	35. List of use of terms
				31. Review, profile and reconcile various water resources related standards	S/M	36. List of standards

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
	6. Conserve and Protect Water Resources and Bodies, both Natural and Artificial	10. Determine priority of water resources use	16. Develop and determine priority for water resources use, particularly in times of crisis or threat	32. Identify key users and uses	S	37. List of key users 38. List of key uses
				33. Identify key water resources use areas	S	39. List of areas
				34. Develop allocation and management plan for water resources based on demand priority and resource availability	S	40. List and number of plans
		11. Protect and maintain condition and state of water bodies	17. Protect, rehabilitate and conserve water bodies and surrounding areas	35. Develop conservation plan for water bodies to sustain the water bodies, including rehabilitation and improvement covering both the ecological, physical systems and aesthetics	M/L	41. Number of plans
			18.Protect surface and groundwater connectivity'	36. Develop water resources contiguity or conjunctive plan	L	42. Number of plans
				37. Establish mechanisms to control the hydrological function connecting surface and groundwater	L	43. List of mechanisms used
		12. Develop and establish economic instruments and measures to value water resources	19.Establish methods to value water resources	38. Identify best practices in the valuation of water resources including water resources pricing and cost recovery (such as payment for ecosystems services)	S	44. List of best practices
				39. Determine options for economic valuation of water resources amongst others according to types, location and condition	S	45. List of valuation techniques
			20. Ensure that the full costs of rehabilitation, remediation and restoration of water resources and water bodies are fully captured in penalizing polluters	40. Establish methods for cost determination and recovery	S/M	46. List of methods
		13. Ensure optimum water quality and yield	21. Maintain water availability and quality for all water bodies	41. Prioritise uses based on classification according to needs and capacity through formulation of time-bound prioritisation plans	S	47. Number of classifications

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
				42. Identification and isolation of water resources stress factors, including determination of effect of multiple use and effects of multiple use	S	48. List of stress factors and effects
				43. Identify and develop measures to address threats from contamination and pollution by controlling pollution at source and non point source	S	49. List of measures
				44. Optimise abstraction rate without compromising sustainability of water resource	S	50. List of methods or techniques
				45. Integration of qualitative and quantitative aspects related to surface and groundwater taking into account the natural flow conditions or water within the hydrological cycle	M/L	51. List of programmes or plans or guidelines
3.Partnerships	7. Stakeholder Inclusiveness and Engagement	14. Mechanisms for formal and informal consultation on matters related to water resources	22.Clarify of roles and responsibilities	46. Establish common objectives, goals and targets for local water resources use and conservation	S	52. List or number of objectives, goals and targets 53. Number of documents
				47. Identify and profile roles and responsibilities and options for shared responsibilities and collaboration	S	54. List of role and responsibilities
			23. Establish means and measures for consultation	48. Establish channels of formal and informal communication networks	S	55. List and number of networks
				49. Identify options to strengthen collaborations, consultations and stakeholder engagement platforms and processes	S	56. List of collaboration programmes or processes
				50. Develop local water plans for integrated and concerted actions related to sustainable use and conservation of water resources	S	57. Number of plans
	8. Shared Water Resources Governance	15. Stakeholder collaboration in water resources governance	24. Develop means and measures for collaborative governance	51. Identify processes and procedures that can be integrated to ensure shared governance of water resources	S	58. List of processes and procedures

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
				52. Identify options for the formation of formal and informal shared and collaborative partnership platforms	S	59. List or Number of partnerships
				53. Establish channels of formal and informal communication networks	S	60. List or number of networks
				54. Review and reconcile the prerequisites in adopted and accepted approaches for water resources conservation and management such as IWRM, IRBM, IFM, ILM etc.	S	61. List of approaches 62. List of approaches reconciled 63. List of reconciliation processes or activities related
				55. Develop and strengthen programmes on awareness and the need for shared responsibility	S	64. List of programmes
				56. Establish platforms for resolution of conflicts and competing interests	S	65. Number of platforms
4.Capacity Building and Awareness	9. Capacity Building	16. Build capacity of key water resources stakeholders	25. Identify capacity building needs and options	57. Identify capacity building needs suited to type and scale and demand	S	66. List of capacity building needs
				58. Invest in research and development programmes	S-L	67. List of investments and areas invested in
				59. Develop training programmes in conjunction with higher institutions of learning and training institutes	S	68. Number of raining programmes 69. Number of partnership arrangements
			26. Identify programmes and activities to help build capacity including expertise and skill	60. Develop education, training and research programmes with local institutions of higher learning	S	70. Number of programmes

Core Area	Thrust	Target	Strategies	Action Plan	Timeline[1]	'Indicators'/ 'Measurables'
		17. Improve understanding and awareness on the importance of water resources security and sustainability	27. Strengthen existing awareness programmes and campaigns to suit goals for water resources security and sustainability	61. Identify platforms for effective engagement of the media and stakeholders	S	71. List of platforms
				62. Develop programmes or activities to suit particular target groups or situations or needs	S	72. Number of programmes 73. Number of activities
				63. Develop recognition programmes for individuals and entity that help promote water resources security and sustainability	S	74. Number of programmes

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
AUGUST 2011

Annex 2.5 - Panel Comments

ANNEX 2.5 - PANEL COMMENTS

Peer Review Panel's Recommendations as Consolidated from Second Sitting on 24 January 2011 (see Section 2.7 of the Report)

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck	
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations
General Preamble	1. Think we should develop a "National Water Policy", an overall policy covering all aspects of water and not only on water resources, on a similar line as National Forestry Policy, National Energy Policy, and National Policy on Environment, etc. The Content Section of the Revised NWRP (at page 4) clearly stated that "the Policy will not address water supply or the industry and the emphasis will be to secure and sustain water resources so that it can continue to support both human and environmental needs". How can water resources be successfully sustained without taking into consideration crucial sectors relating to human activities and economic development which have direct impact on water resources sustainability, development and management? We should try to distance ourselves from sectoral interest for the sake of promoting IWRM principles. By developing a policy on water resources, we are in fact encouraging a sectoral thinking. The other crucial sectors, like water supply and sewerage sectors, etc may consequently, have to develop their own policies on sectoral basis. Is this what we desire to have?	1. I still maintain that the Policy should be completed ideally after the Sectoral Study has been accepted. The Sectoral Study should be able to shed light on gaps, technical or otherwise, that would help to define appropriate policies. It is premature to develop the Policy prior to the acceptance of the Sectoral Study. It is expected that the Policy needs to be agreed to by relevant ministries before adoption. Hence, the importance of the gaps to be attended to, prior to finalizing the Policy.	The revised NWRP is more comprehensive and has taken into account the relevant comments of the 'Peer Group'. However, there are some editorial and grammatical mistakes that need to be addressed. In addition, it would be more presentable if it is more concise.		(1) The document is now too lengthy. I understand that during the 2nd peer review meeting, a lot of concerns from the part of the peer group members were put forward to the consultant. We expected these concerns to be included in the NWRP but certainly not in this format. For me, I think the previous format was crisp and to the point & the consultants just needed to insert/weave in the inputs/concerns of the peer group members. But now, it appears that the consultant has totally "revamped" the document until it is now "unrecognisable" from the original document. Consequently, the new document often appears to "Beat around the bush" as it tries to be "too inclusive"! I feel it is good to include important aspects but making it "Overly inclusive" by including and expanding everything has diluted the gist of the document. From 13 pages, it has ballooned to 21 pages. Some trimming and Summarisation are needed.		My general comment is that the document is comprehensive in its coverage. Although most of the seven main issues I mentioned in the previous submission: 1. Presently drinking water quality is below internationally accepted standards in certain areas. 2. Non-accounted for water of 40 percent should be reduced to economic levels (5-15%). 3. Domestic water consumption per capita in Malaysia is at least 50 % higher than in the EU. 4. More than 90 percent reliance on surface water from dams is environmentally unsustainable. 5. Rivers are heavily polluted, often close to upper catchment areas. 6. Domestic and agricultural water pricing does not even reflect cost of production. 7. Cost of flood mitigation is continuously increasing. Have been addressed, I feel that some could be addressed in a stronger manner, especially points 2, 3, 6 and 7.	
					(2) My concern of the absence of a single agency in charge of water DOES NOT APPEAR to have been addressed by the consultant, though in Page 8, The Ministry of Natural Resources and Environment as secretariat to the National Water Resources Council, will serve as the secretariat to the help facilitate the collaboration of key government authorities in executing the Strategic Action Plans.			

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck	
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations
					A programme of work will follow this Policy to structure the implementation and monitoring of targets achievement. This para is too weak and does not give MNRE any real mandate.			
					(3) The principle of Water Resources Equity as suggested by me in my previous respond is not included, though the consultant has cleverly included the principle of Water Subsidiarity under Collaborative Governance.			
					(4) Overall, I am happy with the new document except for my Point No. (1). Other corrections are in red in the document proper. Thank you.			
Introduction			Introduction, page1, first para, line 9. An additional phrase needs to be inserted after the words 'Third Malaysia Plan' to indicate that it is in respect of the environment and not the Plan itself which has its own stated socio-economic objective. Suggest that phrase 'with regard to the environment 'be inserted after 'Third Malaysia Plan' if the sentence is to be retained.		(1) My concern on the NWRP to be written as a tool for Federal-State cooperation has been addressed in the Introduction (1st para) and Context (2nd para, 3rd para & 7th para). Introduction , Para 1, ... close cooperation to ensure that ~~all man's~~ human activities are in balance with ~~his~~ the environment....		Para 2, ... Malaysia Plan (2011-2015) stresses ~~on~~ the need to ensure water security..... Box.1. Excerpt from the Tenth Malaysia Plan, Chapter 6. ▪ Protecting rivers and groundwater reservoirs from pollution.	
Context			Context, page2, first and second para. Perhaps more appropriate to be in the Foreword by the Minister. Third para onwards need to be recast not to sound too abrasive. Using bullets may be more effective.		(1) My concern on the NWRP to be written as a tool for Federal-State cooperation has been addressed in the Introduction (1st para) and Context (2nd para, 3rd para & 7th para). Context, Para 1, ... It will look at the means.... Context, Para 3, ... There are.... Context, Para 3, ... executive reach to consider, and here the..... Context, Para 3, ... , water as a resource, which will ~~looks~~ at both the dynamic processes..... Context, Para 4, Only by understanding this, can principles of equitable allocation of water..... Context, Para 4, ... needs of ~~man~~ human and environment, as well as to ensure that priority needs for human well being..... Context, Para 5, ... the ~~we have~~ identified key hazards ~~that are~~ caused by water include ~~such as~~ floods and droughts.....		Para 3, ... There <u>are</u> also aspects related to..... Para 3, ... key perspectives .....(Highlight the three perspectives more clearly.) <u>The first perspective....</u> , water as a resource, which will look at.... Para 7,..... . It will focus on water resources, bearing in mind that water resources is a loop whereby water supply and services forms part of, emphasis in this document for the first phase will be to secure and sustain water resources so that it can continue to support both human and environmental needs- Not entirely clear	Para 5,..... many activities related to water resources. The existence of the many activities.... Para 5, ... this, principles of equitable allocation of water can be put in place, to balance both the needs of man and environment, as well as ensure that priority needs.....

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck	
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations
					Context, Para 6,..... water supply and services forms—part of, emphasis.....			
Key concerns related to water resources			Key concerns related to water resources, page 3, Section needs to be summarised to be more focussed and clear. A box on list of laws is not necessary and can make section unwieldy. Using bullets here too can be more effective.		(1) My concern about Gazettement of Water Catchments was not included by the consultant. The word gazettement still does not appear anywhere in the document. I still maintain that gazettement is one of the most effective, if not the most effective, protection of water catchments. The consultant has, however, talked about conserving, sustaining and protecting water resources in the 3rd para under Key concerns related to water resources Key concerns related to water resources, Para 1, ... This National Water Resources Policy..... Key concerns related to water resources, Para 4,.... Thirdly there is a need for a mechanism.... Key concerns related to water resources, Para 5..... . (IS THERE A NEED FOR A BOX ON LIST OF LAWS? PLS ADVICE – NO TOO MANY BOXES ALREADY!) What is crucial here is how decisions are made, particularly the determination of how water will be provisioned and allocated for supply,.....		Para 4,..... . (IS THERE A NEED FOR A BOX ON LIST OF LAWS? PLS ADVICE) What is crucial here is how decisions are made, particularly the determination of how water will be provisioned and allocated for supply - If these laws are conflicting with the NWRP is should be highlighted - If these laws are conflicting with the NWRP is should be highlighted	Para 4,. .... as well as hydrological and hydrogeological functions..... Para 4,..... Decision making which involves multiple.....
Integrated Approaches					Integrated Approaches, Para 2, ... approaches as well as principles that guide them have been taken into account and reflected herein in a collective manner.....			Para 2, ... as principles that guide them have been taken into account and reflected herein in a collective manner. ....
Policy Statement			Policy Statement, page 8, Suggest that statement 2 be adopted.				To make sustainable use and development of water resources in Malaysia a nationwide priority, to help ensure its security through the conservation and effective management of water resources that is effected via a collaborative mechanism advocating partnership involving all stakeholders. - Heavy language.	
Rationale			Rationale, page 8, Can section be merged with section on Context and titled 'Rationale'? Can it be brought forward after section on 'introduction'?					
Objectives					(1) My concern of the narrow original 3 Objectives have been expanded by the consultants to 5 objectives. The objectives now look acceptable.			

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck	
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations
					Objectives: ▪ To set out the direction and strategies for collective action to ensure the security and sustainability of water resources through integrated and collaborative mechanisms involving all stakeholders at all levels. ▪ To provide means and measures to complement existing policy directions related to water resources so as to ensure its sustainable and equitable use as well as protect the integrity of the environment, ecosystems and natural heritage. To set out the means and measures for the adoption of water resources conservation plans at multiple scales to complement and strengthen existing land, resources, physical and other related development plans			
Principles							Water Resources Sustainability - *It also opens up the opportunity to explore the use of alternative sources, and address aspects related to demand management.-* Very good!	
Strategic Action Plan	1) To reinforce my views on the above mentioned, Thrust 3: Use of Alternative Water Resources and Sources (page 13, for example, is a case in point. Strategic Action Plans are too general and does not assist much in planning or what to plan in times of threats or crisis. Take the case of setting up of a sizeable sewerage treatment plant (e.g. in the various economic corridors) for which recycled water can be used substantially as alternative resource for a newly developed industrial area. During planning stage, a large tract of land could be set aside or reserved for this purpose in the industrial area itself so that the treated waste water or alternative resource does not have to be pumped from some distance away causing cost of the alternative water to be unnecessarily expensive. Strategic Action Plan has to be structured or worded to take this into consideration. This is one of the good examples, where water industry requirement must be taken into consideration and							

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	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations
	hence, an overall policy in necessary.							
Target 7								Target 7, Strategy, ▪ Identify alternative or conjunctive water resources options and suitability of use, <u>in particular groundwater and rainwater harvesting</u>
Policy Directions for Core Area 2: Sustain Water Resources							This requires measures that will prioritise and set forward plans for conservation and use based on clear methods that can better value our water resources to ensure there is no wastage or inappropriate usage or misuse of these precious resources. - This should be reflected in a Thrust that deals specifically with reduction in percentage of non-revenue water from present unsustainable levels to achieving international standards based on economic efficiency criteria.	
Target 14					(1) My concern about making Water Demand Management more prominent has been addressed in the new document – Under the principle of Water Resources Sustainability, in Target 14.		Target 14: Adopt measures to implement water demand management nationwide. <u>Strategy:</u> ▪ Determine mechanisms to put into effect water demand management nationwide. <u>Strategic Action Plan: -</u> Is it possible to suggest somewhere that billing for waste water treatment should be combined with and be dependent on consumption of water as in many countries?	
Implementation Plan			Implementation Plan, page 7, first para, The policy should also cover the long term. No commitment should be made when it is to be reviewed. Suggest that reference that it is reviewed in the 11th Plan be deleted.		(1) My concern about the NWRP being a dynamic document that can change with contexts and time has been addressed by the consultant in Implementation Plan (1st Para) Para 1, ... stakeholders including ~~both~~ government, non-governmental, academia, research institutions.....			
Thrust 6, Target 10								Target 10: Determine priority for water resources use
Target 12: Adopt economic measures to value water resources								Strategic Action Plan, ▪ Recommend economic instruments to ensure

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	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations
								efficient supply and demand for water

Peer Review Panel's Recommendations as Consolidated from First Sitting on 10 January 2011 (see Section 2.7 of the Report)

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
General Introduction Coverage Issues to be addressed Preamble	The draft NWRP is to be comprehensive and in line with the future management of national water resources. For this purpose other additional inputs in assuring a complete, holistic and comprehensive NWRP are to be recommended. The draft policy indicates that it is to be centred around four key issues viz a viz security of supply, sustainability, partnerships and capacity building.	1. It is my considered opinion that the key Issues should be centred around moving the management of water resources in the country from a fragmented sectoral approach to one which is consistent with the Integrated Water Resources Management (IWRM) model. This would include issues addressed in the draft outline of the key core areas of NWRP but may not be limited to it. Hence the principles should be driven by this intended migration and the IWRM would be the underlying foundation rather than relatively arbitrary defined areas of focus. 2. In addition, policy development would have to review policies of other relevant countries and bridge the gaps where necessary and feasible. In developed countries, water resources policies have migrated to environment policies where new emerging issues such as climate change and green technology application and issues of bench marking by incorporating appropriate policies to drive improvement are in place.					**Main issues in Water Resources Management (WRM):** The policy emphasizes and concentrates on security and sustainability of water resources. The main issues in WRM in Malaysia are: • Non-accounted for water is about 40 percent. • Consumption is very high by international comparison. • Heavy reliance on surface water supply (dams) for water. • Heavily polluted rivers and risks to groundwater reservoirs. • Water pricing far below costs. • Increasing occurrence of flooding.		See new outline

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		3. I venture to suggest that the title of the policy be amended to National Water Policy as inevitably the scope will need to cover development and management issues downstream of water sources, i.e. water supply and sewerage which are very crucial sectors relating to human activities and economic development and which have direct impact on water resources sustainability, development and management. 4. It would be appropriate for the policy to begin by taking stock of the current issues and challenges faced by the nation in water resources management, especially in intra-sectoral and cross-sectoral development and the weaknesses in legislation and coordination among stakeholders and lack of an integrated approach to resolving long standing problems. 5. The urgent need to quantify the impact of pollution of water resources by incomplete treatment of domestic sewage by the private or public treatment plants and the concern of gross							

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	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		water pollution by underserved areas in sewage treatment. Trends international Water Policy highlighted the fact that people had to be kept at the center of concern for sustainable development and that water management and development should be conducted on a participatory basis with decision making at the lowest appropriate level. 6.There is also growing recognition that greater emphasis must be placed on management of demand for water as against supply management as an economic goods to make sure that water use is as efficient as possible in terms of quantities of water used and the impact of water quality. 7.Within the context of sustainable Water Management, the threat of climate change resulting from global warming and other emerging phenomena is currently the most significant risk and should be-highlighted. The vulnerability of the Water Balance to Climates Change pose serious implication on water availability.							

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		8.There is growing trend in returning water used back into water resources especially in water-short areas – either from sewerage, waste water, and agricultural and industrial wastes. This should be encouraged. 9.It is also vital that the NWRP clearly identify the areas of priority so that the Government and the relevant agencies can initiate appropriate action plans to get the largest gains in the shortest period with constrained resources. 10.The setting of objectives for the policy should preferably follow the SMART principles (i.e it should be Specific, measurable, Achievable, Relevant or realistic and Time bound or defined).							
							Did the Consultant review the Ex-Post Policy Level SEA on the Master Plan for the Development of Water Resources in Peninsular Malaysia 2000-2050 (NWRP)? The above SEA report provides a thorough review and analysis of the existing policy (and legal) framework in Malaysia and it includes a policy compatibility matrix showing how compatible the Malaysian policy framework is with the NWRP (and future water resource policy).	Review the matrix, which is enclosed	

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		The recommended policy direction, strategies and action plans arising from the stock taking above can then be set with immediate and medium term goals. These goals (output and outcome) should be more tangible, e.g. . Institutional	**Institutional Arrangements for Water Resources Management** As this is an important element of water resources governance, certain aspects of it should be included in the National Water Resources Policy.	To expand section on Implementation Plan. May be appropriate to include strategy and strategic action plan on Institutional Arrangements in this section.	Preamble is not inclusive or comprehensive enough page 1-2.	There is no mention of the NWRP being a policy tool for cooperation and collaboration between different levels of government, irrespective of political conviction. Somewhere in the policy it should be mentioned subtlety that the NWRP is for the good of the country and all states. As such, all levels of government should try their best to implement the NWRP. The majority of our rivers have reached maximum capacity in terms of water supply, i.e. no more dams can be built anymore. But population, agriculture, industry and other human developments keep increasing. Hence, there is a need to clearly highlight Water Demand Management (WDM) as an integral approach in the NWRP.			
					Implementation Plan	Page 14 Line 1 The Government acknowledges that contexts and situations change in time and space. As such, the NWRP would be reviewed and updated from time to time when deemed necessary. The Government also acknowledges that continuous....			

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		▪ Recommendation on decentralised or consolidated management structures. ▪ Definition of roles and responsibilities of all stakeholders to streamline overlapping functions to avoid confusion as who does what. Functional arrangement, budget and cost allocation requirement to facilitate implementation of specific functions.			MSAN is currently purely political & administrative.	The NWRP should clearly spell out the role and functions of MSAN & to empower/mandate MSAN to make it more effective.			
		Regulatory Take into consideration existing regulatory regimes at state (water resources) and federal (SPAN) level and their roles in strengthening and complementing water resources development and management.			Malaysia has no single agency solely responsible for managing water resources. Currently too many agencies are involved, often overlapping & competing against each other.	The NWRP should make be known that the government intends to establish a single agency to be solely in charge of water resources management in the country. The MSAN is not this body. Preferably, a federal Department of Water Resources is established with State Branches. The Water Resources Section of DID is a suitable candidate to fill this new role.			
			Economic Aspects Need to be further strengthened.	Need to be further strengthened.					
			Foreword/ Preamble To facilitate reader's understanding of the whole chain of water governance, it may be appropriate to make reference to water services sector.	To be included in Foreword of Preamble.					

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		Technical Identify priority and focus areas with specific targets on water demand management, e.g. NRW targets, per capita consumption, target for rehabilitation and upgrading of aged infrastructures with cost allocations/ estimates, implementation of IWRM and IRBM; water quality targets, water safety plan policy, flood mitigation, hydropower requirement, water pollution from domestic sewage etc.	**Preamble/ Objective/ Implementation Plan** Need to take into account current situation whereby governance is sectorally based and diffused	To be included in Preamble/Objective and supported by additional strategy/strategic action plan in Implementation Plan.	Water Demand Management (WDM) is not emphasized enough in the preamble as well as in the entire document.	Need to make WDM more visible in the Preamble Despite its key role in ensuring future water sustainability, WDM is only mentioned once throughout the document, i.e. at the end of page 5. Need to include WDM as a Key Core Area or at least as a Thrust? The best place to insert WDM is after Target 13 to include a new **Target 14 – Adopt measures to ensure efficient water use via WDM for large water consumers** (see Item 36 below).			
					Protection of water catchments via gazettement as water catchments	In the context of Malaysia, gazettement of water catchments is surely one of the most effective ways of protecting a water catchment and its water resources. However, the word gazettement did not appear once in the entire document. This may be due to fear of resistance and non-acceptance of the NWRP by States. Not withstanding this, water catchments need to be protected one way or another. If gazettement is never to be mentioned, perhaps "Protection of Water Catchments" must surely be included. This can be done under Target 6 (see Item 25 below).			

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		Policy, strategies and action plans on coordination and management of the following areas are recommended to be included: ▪ Optimising the availability of water resources, especially for competing and conjunctive uses, water allocation priority and management between potable and non-potable uses, alternative water resources development including ground water, water re-use, new treatment technology in membrane and others, water demand forecast, flood control and climate change. ▪ Water Demand Management – incorporating efficiency issues of water use in agriculture, rice self-sufficiency policy, water supply (NRW), water conservation and water savings through use of products and instruments, application of tariff and pricing etc. .							

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		▪ The use of sewage effluent as a resource for industrial consumption- identification of sewage treatment sites including regional plants as potential for effluent reuse and the policy to incentivise such initiatives. In water stress areas sewage effluent can be used for non domestic purposes as landscaping and vehicle and equipment washing and upon secondary treatment, it can also be used for industrial purposes. Thus it is pertinent that the necessary policy must be put in place so that this corridors. ▪ Pricing mechanism and tariff reform - There is need for reform in this area, with adoption of "user pay" principle, "full cost recovery" principle, special tariff for the poor, reduction of subsidies and pricing mechanism for sharing of raw water resources and interstate water transfers, etc.							

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	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
		Lastly, the policy should preferably be completed after the sectoral study as the latter would be able to shed light on the gaps, technical and otherwise in these areas that would help to define appropriate policies. The development of policies prior to the completion of the sectoral study appears to be premature.							
Preamble			Page 2 Paragraph 1 Line 1 Suggest change in word to demonstrate importance of water	'catalyst' to be replaced by 'crucial'	1st para, line 5 However, this can lead to unsustainable use – This sentence is misleading.	1st para, line 5 However, in terms of water, renewability is a dangerous misconception and can lead to unsustainable use.	**Preamble: Four guiding tenets**	They are well articulated and cover most aspects	
			Line 4 Suggest change in word	'crucial' to be replaced by 'essential'					
			Line 10 To emphasize that it is a national policy	'the Ministry of National Resources and Environment' to be replaced by 'Government'					
			Line 11, 12, 13 Sentence redundant with suggested change in line 10	Sentence beginning with 'Armed with a national mandate' be deleted.					
			Line 14 Suggest change in word	'Ministry' be changed to 'Government'					
					Beginning of para 2 Add in the following sentence.-	Beginning of para 2 The formulation of the NWRP is a bold step forward by the government towards good governance of water resources.			
					3rd Para – Water for people Need to add in more details	3rd Para – Water for people Water for people: all have access to safe, adequate and affordable water supply for consumption, sanitation, hygiene, recreation, religious use and all other human needs			

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
					4th para, line 3 Need to add in ISMP and ICZM (it is stated in the ppt by the consultant but not mentioned in the policy document)	4th para, line 3 ....Integrated Water Resources Management, Integrated River Basin Management, Integrated Flood Management, Integrated Land Management, ISMP and Integrated Coastal Zone Management.			
Policy Statement	Some of the Policy Statements are expected to cover the following: 1) Integrated Water Resources Planning and Management (i) Integrated River Basin Management. (ii) Integrated Lake Basin Management. (iii) Integrated Catchment Management (iv) Integrated Coastal Zone Management. (v) Integrated Aquifer Basin Management. (vi) Trans-boundary Water Resources Management. 2) Water Resources Demand Management (i) Economic Incentives and Values. (ii) Regulatory Controls. (iii) Water Saving Technology. (iv) Consumer Education and Awareness. (v) Sectoral Demand Management. (vi) Rainwater Harvesting. 3) Water Quality Management (i) Water quality and pollution control. (ii) Catchment conservation and management, land use including riparian reserves. (iii) Sanitation and Public Health. 4) Water Resources Development and Financing (i) Policy targets for water resources development.		Needs to be more definitive. Inclusion of word 'effective' to demonstrate importance of efficacy of approaches.	'Ensure security and sustainability of water resources for all through effective, sustainable use and conservation of water resources'.	Rewrite.	The security and sustainability of water resources through effective and inclusive water governance, equitable access, sustainable use and conservation of water resources shall be made a national priority to ensure adequate water for all, including for nature and for environment.	Security and sustainability is to narrow as a policy statement.	Propose that the policy statement include: "adequate and safe water for all, while maintaining conservation and sustainable use objectives" (See below).	

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
	(i) Consumptive Usage; 1. Water Supply for domestic, industrial. and institutional usage 2. Irrigation for food production . 3. Groundwater development. 5) Water Resources Information Management (i) Hydro-informatics and Information Portal. (ii) Data and information Sharing. 6) International Cooperation (i) International Conventions, Agreements and Protocols. 7) Water for the Future (i) Response to Climate Change and other emerging issues. (ii) Using water wisely.								
Rationale			Needs to be further strengthened.	Suggest key words used in 10 Malaysia Plan with respect to National Water Resources Policy be included. Such words include 'efficient and effective management' and 'efficient and equitable distribution of water resources'.	Line 2 Line 4 Line 5 Line 6	...resources are governed, used and developed... ...effect adequate conservation.... more efficient management..... ...boundaries, both at national and international levels.			
Objectives			Page 4, line 2 Suggest change in sentence to include 'effective'.	'To set direction to facilitate effective and uniform actions towards ensuring water resources security and sustainability'.	There are only 3 objectives & they do not comprehensively cover all the topics mentioned in the Thrust & Targets.	It is my opinion that the consultants re-look at the Key Core Areas, Thrusts and Targets to ensure theses are included in the Objectives.	Objectives are statements of what is intended, specifying a desired direction of change.	Some of the objectives are more strategies than objectives.	
			Page 4, line 8 & 9 Suggest additional objective on Implementation Plan as implementation has always been the mean weakness of all policies.	'To present an Implementation Plan that is practical and essential for Water Resources Governance.'				Broaden the policy objectives to cover a broader range: Conservation and Sustainable Use Objectives: biophysical) • To conserve biodiversity, landscape, water resources, water quality, to	

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
								decrease demand and flood risk, and to manage competition. Effectiveness objectives: (social / cultural /equity objectives) • To safeguard heritage, public health, local communities, and support good governance. Efficiency objectives: (economic development objectives) • To provide food security, rural development, and sufficient water to spur and sustain economic growth. Institutional: to support and strengthen the institutional and legal framework (e.g., laws).	
			Page 4, line 2 Suggest change in sentence to include 'effective'	'To set direction to facilitate effective and uniform actions towards ensuring water resources security and sustainability'					
Principles			Page 4, line 8, line 9 Water Resources Sustainability To affirm importance of water, suggest amendment of sentence to be more definitive.	'The use of alternative sources should be explored and aspects related to demand management addressed'.	There are only 2 principles, viz. Water Resources Security and Water Resources Sustainability. Need to include more principles that are important.	Need to include at the very beginning **the principle of Effective Water Governance,** which combines policies and actions that are coherent and integrative and institutions (both public and private) that are open and transparent for public access. Effective governance should be inclusive and communicative at all levels to include participation of all stakeholders.			

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	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
						Effective governance should include the **principle of Water Resources Equity** in terms of governance and sharing of the resource between in terms of governance and sharing of the resource between human use systems and natural systems, humans and other life forms, gender, interest groups, stakeholders, service providers and consumers. Need to include the **principle of Water Subsidiarity** whereby decision-making is driven by inclusiveness from the very top to the lowest appropriate level.			
General on Core Areas etc							If the above framework of objectives are accepted, the individual elements can quite easily be rearranged to fit the different objectives.		
Strategy 1					Page 6 Edit sentence under Strategy 1	1. Consolidate and update existing scientific and technical data from time to time.			Would the term periodic review and update be preferable and an additional SAP be included to reflect the same?
Strategic Action Plan					Page 6 Action 3 seems odd. I am not sure why it should be there.	Consultants to re-look at it. Please explain & justify why Action 3 is there.			Issues were raised about copyrights of information – perhaps instead of this the matter could be embedded in the inventory process – ie cataloguing etc Will be removed.

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
Target 2 Strategic Action Plan 5			Strategic Action Plan 5: Suggest addition of phrase.	Review existing database framework, identify gaps, revise scope and coverage.					Noted and will be amended.
Strategic Action Plan 9					Page 6 Under Strategic Action Plan	Review existing evaluation and analysis methods.....			Query
Target 4 Strategy 7					Line 13 edit	(e.g. quality, volume, environmental flow and water body health)			Noted and will be amended
Target 5 Strategic action Pelan 15					Line27 edit	e.g. climate change, disasters, civil unrest, etc.			Query - civil unrest
Target 6					Protection of water catchments is not emphasised enough.	Add a section to emphasise the need to protect water catchments from unsustainable development. Strategy: Protection of water catchments. Strategic Action Plan: ▪ Identify important water catchment areas. ▪ Take steps to protect water catchments, including gazettement as water catchments.			Noted and will be revised to reflect gazzette-ment requirements.
Thrust 3					Page 9 Line 1 edit	Thrust 3: Alternative Water Resources Use			Noted and will be revised-Alternative Water Sources
Thrust 4					Page 9 Line 13 edit	Thrust 4: Risk Reduction, Preparedness and Response for Water Related Disasters			Query - Disasters to and from
Thrust 4					Page 9 Line 16 edit	Threats from water disasters.			
Target 11					Page 10 edit	Target 11: Protect condition and state of water catchments and water bodies.			Noted and will be amended
Strategy					Page 10 edit	Adopt plans to protect, rehabilitate and conserve water catchments, water bodies and surrounding areas.			Noted and will be amended

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
Strategic Action Plan					Page 10 edit	Develop protection plan for conservation of water catchments to sustain the water bodies,....			Noted and will be amended
Target 12					Page 11 After Line 13 Insert	• Ensure equity of economic tariffs and costs. • Establish mechanisms whereby the poor are not marginalized.			Noted Query – is this related to water resources valuation or pricing of water for use.
Strategy 19			Establish methods to value water resources.						Noted and will be amended
Strategic Action Plan			Suggest additional strategic action plan to facilitate implementation.	Recommend fiscal and financial incentives.					
Target 13					Page 11 Line19 Repetition or mistake ...of multiple use and effects of multiple use	Page 11 Line19 ...of **single** use and effects of multiple use			Noted and will be amended to single and multiple uses.
					Page 11 Line 21 Add	Page 11 Line 21 ...controlling pollution at source, non-point source and transboundary pollution.			Noted and will be amended
					Page 11 Line 24 Add	Page 11 Line 24 ...cycle (to ensure abstraction rates do not exceed groundwater recharge rates)			Noted and will be amended
Additional Target to be added					Page 11 After Line 24 Insert a new Target 14	Page 11 After Line 24 **Target 14: Adopt measures to make water demand management mandatory for large water users** Strategy. • Impose Mandatory WDM plans for new buildings, new plumbing structures (e.g. water saving equipment).			Noted

Aspect	Dato Syed Mohd Shahbuddin		Raja Dato Zaharaton Raja Zainal		Prof Chan Ngai Weng		Mr Soren Beck		Notes
	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
						• Implement awareness, education and communication programmes for consumers at all levels to change behaviour on water use. • Introduce economic incentives such as tariffs and charges for water use (domestic, industrial, agricultural) and for provision of environmental services. • Introduce subsidies or rebates to be given to efficient water users but impose penalties on inefficient water users (or water wasters). • Introduce regulations and byelaws that set standards for water consumption to prevent "waste, misuse or excessive consumption" as well as to cover standards and use of water fittings/appliances. For example, water fittings/appliances are required to achieve minimum standards of water efficiency. • Introduce innovative technologies for reducing water consumption such as drip irrigation, retrofitting and pressure reduction, dual-flush cisterns, automatic faucets, etc.			

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	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	Comments	Recommendations	
Target 14					Page 12 After Line 7 Page 12 After Line 14 Insert Page 12 After Line 19 Insert	Page 12 After Line 7 * Identify all stakeholders Page 12 After Line 14 * Identify all stakeholders Page 12 After Line 19 * Develop sharing of responsibilities and decision-making via empowerment of stakeholders based on equal representation.			Noted – will be amended to state identify and profile stakeholders, their mandates, interests, roles and responsibilities.
Target 15 Additional Strategic Action Plan				Identify and implement on a pilot basis joint projects that promote accepted approaches for water resources management such as IWRM and IRBM.					Noted and will be amended
Target 16					Page 13 Line 7 Edit Page 13 Line 18 edit	Page 13 Line 7 * Formulate training programmes with institutions of higher learning, training institutes and NGOs Page 13 Line 18 Learning, training institutes and NGOs			Noted and will be amended to reflect inclusion of NGO groups
Strategy 25			Additional Strategic Action Plan	Forge and strengthen international links/networks.					Noted and will be amended.
Target 17					Page 13 After Line 26 Insert	Page 13 After Line 26 * Provide funding and grants for research and development			Noted and will be amended.

Annex 2.6 - Draft National Water Resources Policy - Revised Outline

DRAFT NATIONAL WATER RESOURCES POLICY

1.0 INTRODUCTION

2.0 BACKGROUND

2.1 Key Concerns Related To Water Resources

2.2 Complementing Existing Policy Directions

2.3 Integrated Approaches

2.4 Implementation Plan

3.0 POLICY STATEMENT

3.1 Policy Rationale

3.2 Policy Principles

3.3 Policy Objectives

4.0 POLICY KEY CORES AREAS, THRUSTS, STRATEGY AND STRATEGIC ACTIONS

4.1 Policy Core Area 1: Water Resources Security

4.2 Policy Core Area 2: Water Resources Sustainability

4.3 Policy Core Area 3: Partnerships

4.4 Policy Core Area 4: Capacity Building

1.0 INTRODUCTION

As early as in the 1970's, the concern for the state and condition of Malaysia's natural resources has been taken into consideration with the formulation of policy directions and measures to ensure that the use of these precious natural resources are guided by principles of[1] sustained yield management. The Malaysian National Environmental Policy[2], therein contained in the Third Malaysia Plan (1976-1980), took into account the critical importance of maintaining the quality of the environment relative to the needs of the population, particularly the productive capacity of the country's resources in agriculture, forestry, fisheries and water supply. The concern then lay rooted in the state and condition of water, so as to ensure that it remains available to not only support national development goals but to help maintain ecosystems. The ultimate aim of the Third Malaysia Plan was to enable both Federal and State Governments work in close cooperation to ensure that all man's activities are in balance with his environment[3]. Priority then was to address concerns relating to the factors that threaten the stability of hydrological regimes.

Four decades on, the concern for water and water resources remains paramount. The Tenth Malaysia Plan (2011-2015) stresses the need to have a National Water Resources Policy (NWRP) which will chart the future course for the sector. In considering Malaysia's long term supply-demand profile, the policy will outline measures to ensure efficient and effective management

This is a[4] point of departure for this National Water Resources Policy, which will pursue the adoption of measures to ensure the sustainability of water resources to achieve water security. This however, echoing the sentiments of the past decades, will require the forging of partnerships between all levels of government and stakeholders to ensure that water resources are made a priority nationwide.

2.0 BACKGROUND

The Tenth Malaysia Plan states that there is a need to put forth a National Water Resources Policy that will serve as a comprehensive guide to aid water and water resources governance nationwide. This Policy will set out the means to ensure that existing and proposed policy directions from multiple sectors related to water as a whole are complementary. It will look at ways to ensure uniformity of existing legal provisions, institutional mandates and policy directions, consolidating the same through effective and efficient measures and mechanisms. In addition, it will provide guidance to help address knowledge gaps, as well as strengthen methods and practices to ensure that water resources are not just managed in an integrated manner, but geared towards sustainable development and use. Through this Policy, all policy

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1 The text in RMK3 refers to sustained yield not sutainable management.

2 See RMK3 page 219.

3 See RMK3 page 219. Direct quotation – perhaps insert quotation marks. See pgs 221 to 222.

4 Suggest the use of 'the' to emphasise that the policy has been drafted to fulfil the RMK10 point of entry.

actions from all sectors of government that relate to and affect water as a whole can be consolidated, complemented and implemented, guided by the directions set forth herein.

The NWRP recognises the fact that the Federal Constitution of Malaysia provides that water resources in so far as they remain within the jurisdiction of a State, lie within the legislative purview of that State. However water resources too can be connected with various aspects that fall within the legislative purview of both Federal and State governments. For example the use of water and the discharge of polluted watercan be tied with aspects related to trade and industry, which falls within the Federal legislative list. Thus, water resources cannot be simply compartmentalised to suit the Ninth Schedule of the Federal Constitution. There are also aspects related to government executive reach to consider, here the Federal government through the Federal Constitution can provide support nationwide to boost what can be termed as water intelligence.

It is important to note also that this National Water Resources Policy will not specifically address water supply or the industry. It will focus on water resources, bearing in mind that it is a continuum of which water supply, distribution and services form part Emphasis will be to secure and sustain water resources so that they can continue to support both human and environmental needs. This Policy recognises the steps taken by the Government since 1999 to deal with aspects related to conservation, management and provision of adequate and safe water for the people and the environment. It also leverages on the already established National Water Resources Council, which serves as a platform to help bring both Federal and State governments together to identify means and measures to address issues and capitalise on opportunities related to water resources. Based on concerns raised by various stakeholders and the need for better water resources management and conservation, four guiding tenets underpinning government effortshave been maintained by the Ministry of National Resources and Environment, i.e.

> *Water for people*: all to have access to safe, adequate and affordable water supply, hygiene and sanitation.
>
> *Water for food and rural development*: provision of sufficient water that will ensure national food security and promote rural development.
>
> *Water for economic development*: provision of sufficient water to spur and sustain economic growth within the context of a high income economy.
>
> *Water for the environment*: protection of the water environment to preserve water resources (both surface water and groundwater) and natural flow regimes, biodiversity and the cultural heritage, along with mitigation of water-related hazards.

It is important to note here that water resources should be looked at from at least three key perspectives. Firstly, water as a resource, which will look at both the dynamic processes that both recharge water bodies and catchments, right up to the hydrological regimes, as well as hydrogeological conditions. Here, water resources are seen as a continuous process from their transformation into a resource either in its gaseous, liquid or solid form, right up to the water that is discharged back into water bodies or catchments after use. It looks at the

sources of water as well, which can be natural or artificial, and includes the areas or means that rechargewater sources, such as natural catchments or even artificial ponds. The sources of water too are manifold; if natural it can be drawn from surface or ground, if artificial, it can include water sourced from the sea that has been desalinated or grey water that has been treated.

The second perspective that requires looking at is the many activities related to water resources. The existence of the many activities, both human and natural, indicates that a water resource has multiple functions that support both humans and the environment. It functions as a life support that ensures human wellbeing and the integrity of the ecosystems that helps these precious resources recharge. Here, the key factor is understanding the multiple functions that water provides and the many uses as well as users that rely on it. These include activities that stem from all forms of use, such as irrigation, supply, distribution as well as treatment. By understanding this, principles of equitable allocation of water can be put in place, to balance both the needs of man and the environment, as well as ensure that priority needs for human well being are addressed.

The third perspective to be considered is the impacts from and on water resources. At present, key hazards that are caused by water, including floods, in addition to impacts that affect water such as over abstraction, pollution, erosion and siltation. These are just some of the impacts that can threaten and pose a risk to the state and condition of water resources. There are also emerging threats, like impacts which follow from climate change, that require precautionary measures to help water resources adapt to changing conditions. Ensuring the state and condition of water resources will continue to be a priority, steps to address pollution as well as other factors that can degrade water bodies and catchments must be taken.

2.1 Key Concerns Related To Water Resources

There have been numerous studies and reports indicating that water resources in Malaysia are faced by multiple threats and their state as well as condition require rehabilitation. This National Water Resources Policy takes into account the various concerns that range from knowledge gaps to awareness, right up to the various factors that have specific impact on water resources types or water sources, based on local conditions or events. All these concerns have been addressed in formulating the policy directions. There are five key areas of concern that can be derived from various reports and documentations.

Firstly, there is a necessity to develop comprehensive information on water resources, which includes aspects such as sources, location, scale, size, state, hydrological condition, threats, risks as well as impacts both existing and emerging. Crucial here is the need to boost water intelligence and secure what the country has. This requires strengthening the knowledge base and science of water resources, taking into account all types and sources of knowledge and scientific pursuits (science, social sciences and humanities), including traditional and local understanding as well as practices. This will help both Federal and State governments to better safeguard the water resources within their respective jurisdiction.

Secondly, an overall plan to ensure the sustainability of water resources is required. There are increasing reports on water resources being threatened and impacted by human activities

and influence, as indicated in documented incidences where water bodies have deteriorated, or depleted particularly in times of dry weather spells. There is a need to put forward structured recommendations to ensure water resources are conserved and sustained. Protection measures should be put in place to safeguard the quality and quantity, as well as the means for the water bodies to be recharged, which would mean extending the same to catchments. Measures should also be put into place to make sure that water will be used more efficiently, and prioritisation of allocation for different types of uses must be developed, so as to ensure equitable use. Adoption of uniform measures will help establish a system that will gear water resources towards sustainable use.

Thirdly, there is a need for a mechanism that will allow mandated authorities to determine and assess the state and condition of their water resources. This is to ensure that when they are allocated, it is done so without compromising its ability to recharge or diminish its ability to support the environment, its ecological, hydrological as well as hydrogeological functions. In addition, it will spell out steps to avert or minimise threats and risks to and from water resources. This will strengthen actions for water resources security, and help address the governance of water resources that transcend jurisdictional boundaries.

Fourthly, there are many stakeholders where water resources are concerned, taking into consideration the three perspectives of resources per se, activities and impacts. In some jurisdictions, formal statutory measures have been put into place to facilitate authority and management of water resources. There is also a host of statutes and enactments that can be linked directly or indirectly to water resources, which leads to issues relating to differing standards and procedures. What is crucial here is how decisions are made, particularly the determination of how water will be provisioned and allocated for supply, which has great bearing on the state and condition of the water resources. Decision making which involves multiple stakeholders and interests as well as mandates, requires a mechanism that will entrench a system of collaboration and partnership that is advocated by adopted approaches, such as Integrated Water Resources Management and Integrated River Basin Management. There are different fields of expertise held by different mandated authorities that can be capitalised on in an integrated manner. A collaborative arrangement based on a central goal that prioritises water resources will help shift water resources governance towards governance through partnership and collaboration, to benefit all parties as well as the environment itself, so as not to affect the integrity of water resources.

Fifthly, there have been numerous efforts by the government and non-governmental organisations as well as concerned communities to raise awareness, build capacity and initiate action to help rehabilitate water resources. Various programmes and campaigns have been carried out, but the rate of improvement of the condition and state of water resources is not progressing as fast as hoped. Reports have indicated that there are two key constraints, the capacity of the authorities to tackle the problem and the level of awareness of the public at large. There is a general perception that water is abundant, as the country is blessed with continuous rainfall. The reality, brought home by cases of contaminated water resources wreaking havoc on supply or incidences of drought, indicates that water resources though renewable are finite. Steps will have to be taken to ensure that authorities mandated can carry out tasks at hand, which will require capacity building, not just of expertise and skills, but also monetary, technological and technical support. Critical also is the understanding by

all concerned, of the roles and options to participate in water resources governance, which requires a heightened level of public awareness as to how they can contribute to ensure water resources sustainability.

2.2 Complementing Existing Policy Directions

This National Water Resources Policy will not sit in isolation of other policy directions. The formulation of the Core Areas, Targets, Strategies and Strategic Action Plans to be adopted by the many stakeholders took into consideration existing policies. A total of 51 national policies were reviewed and of those 19 were identified as having close links with the varied aspects of water resources. Key aspects of these 19 policies were gleaned and suited to match the directions and recommended actions within (see Table 1.0). As the focus and emphasis of this National Water Resources Policy is on providing directions for means and measures, the strategic action plans proposed are also geared towards complementing the goals of the existing policies. Table 2.0 indicates the Cores Areas and their links with the 19 identified policies.

Table 1.0. List of Selected Ministries and Policies that have bearing on the National Water Resources Policy

Ministry	Policy
Ministry of Natural Resources and Environment	National Mineral Policy 2 National Forestry Policy 1978 National Biodiversity Policy National Wetlands Policy National Environment Policy National Policy on Climate Change National Land Policy
Ministry of Education	National Education Policy
Ministry of Plantation Industries and Commodities	National Biofuel Policy National Timber Industry Policy
Ministry of Energy, Green Technology and Water	National Energy Policy National Green Technology Policy
Ministry of Science, Technology and Innovation	National Biotechnology Policy
Ministry of Tourism	National Tourism Policy
Ministry of Agriculture and Agro-Based Industry	Third National Agricultural Policy Food Security Policy
Ministry of Health	National Food Safety Policy
Ministry of Housing and Local Government	National Solid Waste Management Policy National Physical Plan

Table 2.0. Example of National Water Resources Policy Complementing Existing National Policies

CORE AREA	THRUST	RELATED POLICY
Water Resources Security	Thrust 1 : Water Intelligence	National Green Technology Policy National Policy on Environment National Physical Plan National Policy on Climate Change National Policy on Biological Diversity Third National Agricultural Policy
	Thrust 2 : Water Resources Integrity	National Physical Plan National Green Technology Policy National Policy on Environment National Food Security Policy National Timber Industry Policy National Land Policy
	Thrust 3 : Alternative Options for Water Resources Use	National Policy on Environment National Policy on Climate Change National Green Technology Policy National Minerals Policy 2 National Energy Policy National Biofuel Policy
	Thrust 4 : Disaster Risk Preparedness and Response	National Policy on Biological Diversity National Policy on Environment National Physical Plan National Policy on Climate Change National Food Safety Policy
Water Resources Sustainability	Thrust 5 : Promote Consistent Application of Criteria & Characterization of Water Resources	National Green Technology Policy National Policy on Biological Diversity Third National Agricultural Policy
	Thrust 6 : Conserve and Protect Water Resources and Bodies, both Natural and Artificial	National Green Technology Policy National Policy on Environment National Policy on Biological Diversity National Policy on Climate Change National Physical Plan National Urbanisation Policy National Consumer Policy National Forestry Policy National Solid Waste Management Policy National Tourism Policy National Timber Industry Policy National Food Security Policy National Land Policy
Partnership	Thrust 7 : Stakeholder Inclusiveness and Engagement	National Policy on Environment National Policy on Biological Diversity National Green Technology Policy National Solid Waste Management Policy
	Thrust 8 : Shared Water Resources Governance	

Table 2.0. Example of National Water Resources Policy Complementing Existing National Policies

CORE AREA	THRUST	RELATED POLICY
Capacity Building and Awareness	Thrust 9 : Capacity Building and Awareness	National Forestry Policy National Environment Policy National Policy on Biological Diversity/ National Urbanisation Policy National Physical Plan Third National Agricultural Policy National Minerals Policy 2 National Green Technology Policy National Solid Waste Management Policy National Education Policy National Biotechnology Policy

2.3 Integrated Approaches

This National Water Resources Policy will continue existing approaches that have been adopted such as:

- Integrated Water Resources Management (IWRM)
- Integrated River Basin Management (IRBM)
- Integrated Lake Management (ILM)
- Integrated Coastal Zone Management (ICZM)
- Integrated Shoreline Management Plan (ISMP)
- Integrated Flood Management (IFM)

These approaches will help structure current practice towards better water resources governance, taking into consideration their unique application ranging from facilitating allocation to addressing hazards. The tools employed in translating the approaches as well as principles that guide them have been taken into account and reflected herein in a collective manner.

2.4 Implementation Plan

This National Water Resources Policy is intended to serve as a directional focal point to help bring together stakeholders including government, non-governmental, academia, research institutions, private sector and communities to help translate the strategic action plans into action. The time frame for the adoption for implementation of the strategic plans ranges from short to medium term, as this Policy is expected to be reviewed from time to time. This will help ensure that the Policy stays dynamic and flexible enough to adjust to changing conditions.

The Strategies and Strategic Action Plans have been designed to address immediate problems and concerns related to water resources today. The emphasis here is to structure a work programme that will strengthen existing water resources governance and address gaps and constraints that exist. The key is that water resources will be made a priority, and emphasis is made on uniformity of legal provisions that regulate standards and practice, as well as consolidating and enhancing the existing knowledge base and science. It is hoped that like land and land use, a physical plan will be developed to help conserve and protect

water resources, balance water resources use as well as provide means to help address and adapt to threats, hazards and disasters. The Ministry of Natural Resources and Environment, as secretariat to the National Water Resources Council, will help facilitate the collaboration of key government authorities in executing the Strategic Action Plans. A programme of work will follow this Policy to structure the implementation and monitoring of targets.

3.0 POLICY STATEMENT

The security and sustainability of water resources shall be made a national priority to ensure adequate and safe water for all, through sustainable use, conservation and effective management of water resources enabled by a mechanism of shared partnership involving all stakeholders.

3.1 Policy Rationale

This National Water Resources Policy shall set the strategic direction and framework for strategic action to ensure that water resources are used and developed in a sustainable manner to benefit the nation, both people and environment as a whole. It sets out strategies that will help guide the many water resources stakeholders to structure actions for effective conservation and management of water resources. The approach that will be taken will be based on existing integrated approaches that have been adopted so as to continue and further inculcate actions that are concerted and consolidated. Bearing in mind that a water resource may transcend jurisdictions as well as mandates, emphasis will be made on collaborative water resources governance that advocates partnership.

3.2 Policy Principles

Water Resources Security

Water resources must be secured to ensure their availability to meet the needs and demands of both man and nature, through optimisation of their potential and minimisation of damaging impacts.

Water Resources Sustainability

Water resources are the catalyst for environmental wellbeing and national development, therefore they should be sustained for present and future uses and Federal and State Governments will look at minimising wastage of water resources. It also opens up the opportunity to explore the use of alternative sources, and address aspects related to demand management.

Collaborative Governance

Stakeholder inclusiveness and collaboration is essential towards ensuring the security and sustainability of water resources as well as achievement of common goals towards addressing multiple water resources governance concerns and priorities.

3.3 Objectives

- To set out the direction and strategies for collective action so as to ensure the security and sustainability of water resources through integrated and collaborative mechanisms involving all stakeholders at all levels.

- To provide means and measures to complement existing policy directions related to water resources so as to ensure their sustainable and equitable use, as well as protect the integrity of the environment, ecosystems and natural heritage.

- To provide a platform to strengthen water resources intelligence as well as uniform practices through the streamlining of standards, measures, methods and approaches.

- To set out the means and measures for the adoption of water resources conservation plans at multiple scales so as to complement and strengthen existing land, resources, physical and other related development plans.

- To build the capacity of all stakeholders for effective participation and collaboration in water resources governance at multiple scales and levels focusing on developing human resources, science, technology and practice as well as encouraging investment in research, development and innovation.

4.0 KEY CORE AREAS, THRUSTS, TARGETS, STRATEGIES AND STRATEGIC ACTION PLANS

4.1 Policy Directions for Core Area 1: Water Resources Security

Governing water resources requires strengthened water intelligence. Action is required to improve systems for information provisioning, collection and networks, in addition to putting in place measures to better assess, evaluate, monitor and analyse the state as well as condition of both natural and artificial sources of water. Key also is the need to provide for uniformity in the practice of water resources governance, necessitating the development of streamlined and consolidated standards and measures to be applied nationwide. This will facilitate the application of integrated measures and approaches in protecting the integrity of water resources, the environment, ecosystems and natural heritage. Critical too is the need to address all aspects that render water resources vulnerable to threats, risks, impacts and hazards as well as disasters both from and to the water resources. This also includes actions that will provide for the contiguous use of water resources in addition to exploring options for alternative sources of water for specific and appropriate uses particularly in times of emergency. Plans that help set out measures to build the resiliency and facilitate adaptation to existing and emerging threats must be given priority in order to secure water resources.

Thrust 1: Water Intelligence

Target 1: Develop a comprehensive water resources information system

Strategy:

- Conduct periodic consolidation and update existing scientific and technical data.

  Strategic Action Plan:

  - Identify existing scientific and technical data available related to water, water resources, use and users.
  - Identify repositories and repository holders.

Strategy:

- Establish a system for continuous analysis or synthesis of scientific and technical data.

  Strategic Action Plan:

  - Identify and adopt methods and processes for continuous analysis and synthesis of scientific and technical data.

Target 2: Strengthen database framework

Strategy:

- Create a database framework and establish information networks

  Strategic Action Plan:

  - Review existing database framework, identify gaps, revise scope and coverage.
  - Review existing evaluation, analysis and review methods.
  - Establish processes for information provisioning, collection, cataloguing and management.

Strategy:

- Establish communication framework between key stakeholders.

  Strategic Action Plan:

  - Develop a profile of stakeholders and existing information database.
  - Provide mechanisms for sharing of information and access between stakeholders.

Target 3: Standardise multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources

Strategy:

- Introduce uniformity in practices related to water resources evaluation and analysis.

Strategic Action Plan:

- Review existing and develop criteria for water resources state, status and condition evaluation and analysis.

Thrust 2: Water Resources Integrity

Target 4: Set national standards to determine thresholds for water resources to protect their availability and integrity of water bodies.

Strategy:

- Improve and develop measures to determine threshold and yield of water resources and integrity of water resources bodies.

Strategic Action Plan:

- Profile methods and measures used to determine threshold and yield.
- Develop system to consolidate information to establish national standards and parameters for setting threshold and yield levels for different water resources types and water resources bodies.

Strategy:

- Develop national water resources related standards (e.g. quality, volume, environmental flow and water body health).

Strategic Action Plan:

- Review, revise and reconcile current standards for determining integrity and health of water resources.

Target 5: Reduce vulnerability of water resources to impacts and threats as well as strengthen adaptability to ecosystems and physical changes

Strategy:

- Identify threats, impacts and hazards that affect water resources and bodies including all form of threats, hazards and impacts ensuing from water bodies.

Strategic Action Plan:

- Identify existing and emerging threats to and from water resources as well as water bodies.
- Identify options and measures to reduce, mitigate and remove stress, threats, impacts and risks including transboundary risks, threats, impacts and hazard events.
- Determine measures to aid adaptation of water resources to threats and emerging threats e.g. climate change and disasters.
- Identify and develop water resources conservation plans for high risk areas.
- Identify options for ensuring resiliency of water resources from stress, threats, impacts, hazard and disaster events.

Target 6: Develop water resources conservation plans for strategic, sensitive and critical water resources areas and bodies

Strategy:

- Determine resiliency of water bodies and areas to stress, risks, impacts and hazard events.

  Strategic Action Plan:

  - Profile characteristics and nature of stress, risks, threats and hazards.
  - Identify water resources conservation options, targets and action plans.
  - Identify levels and classifications of sensitivity and delineate sensitive areas and zones.
  - Identify key catchment areas and zoning options.

Strategy:

- Determine measures based on adaptability for controlled development in areas earmarked for development.

  Strategic Action Plan:

  - Profile measures to aid adaptability.
  - Develop water resources sensitivity database and maps.
  - Incorporate data related to sensitivity in physical and national development planning processes, including the evaluation, review and assessment of development programmes and projects.

Thrust 3: Use of Alternative Water Resources and Sources

Target 7: Optimise options for alternative, conjunctive or contiguous use of different water resources types to reduce stress on existing sources

Strategy:

- Explore different options for alternative uses of different types of water resources.

  Strategic Action Plan:

  - Identify alternative or conjunctive water resources options and suitability of use.

Strategy:

- Promote efficiency and reduce dependency on stressed water resources.

  Strategic Action Plan:

  - Review, enhance or develop plans and procedures to address stressed water resources in times of threats or crisis.

Thrust 4: Water Related Disaster Risk Reduction, Preparedness and Response

Target 8: Adopt a national Disaster Risk Reduction, Preparedness and Response plan for water resources to introduce measures for preparedness and response, as well as reduction of risks and threats of disasters from and to water resources

Strategy:

- Develop national level scientific assessment procedures for risk, threat and hazard determination, as well as preparedness and response needs for water resources.

  Strategic Action Plan:
  - Identify potential disaster events.
  - Identify areas and scale of potential impacts and risks.
  - Develop risk assessment procedures.

Strategy:

- Develop response and preparedness plans for water resources protection and alternative water resources.

  Strategic Action Plan:
  - Identify alternative water resources to supplant affected water resources.

4.2 Policy Directions for Core Area 2: Water Resources Sustainability

The sustainability of water resources is critical to the nation's wellbeing, economic development and protection of the natural systems. Fundamental to this is the adoption of uniform criteria for water resources characterisation, which will lead to strategic prioritisation for allocation and equitable use, taking into account needs in times of crisis or threats. Key to sustaining water resources is the adoption of measures that will protect the condition and state of water bodies and their catchments, as well as maintaining the hydrological functions that ensure their availability. This requires measures that will prioritise and set forward plans for conservation and use, based on clear methods that can better value water resources to ensure there is no wastage or inappropriate usage or misuse. Steps must also be taken to ensure the optimum yield and quality through measures that will ensure that thresholds and capacities are not exceeded, and degraded resources rehabilitated. Mechanisms must also be put into place to ensure the control of impacts to and from water resources.

Thrust 5: Criteria for Water Resources Characterisation

Target 9: Adopt national criteria for water resources characterisation and standards

Strategy:

- Establish uniform measures, terms, standards and guidelines.

  Strategic Action Plan:
  - Develop uniform use of terms to characterise water resources.
  - Review, profile and reconcile various water resources related standards.

Thrust 6: Conservation and Protection of Water Resources and Bodies, both natural and artificial

Target 10: Determine priority for water resources use, particularly in times of crisis or threat

Strategy:

- Develop criteria to determine water resources use priority.

  Strategic Action Plan:

  - Identify key users and uses.
  - Identify key water resources use areas.
  - Develop allocation and management plan for water resources based on demand priority and resource availability.

Target 11: Protect condition and state of water resources, catchment and bodies

Strategy:

- Adopt plans to protect, rehabilitate and conserve water resources, catchment bodies and surrounding areas.

  Strategic Action Plan:

  - Develop protection plans for conservation of water resources, catchments and bodies to sustain the water resources, including rehabilitation and improvement covering the ecological, physical systems and aesthetical aspects.

Strategy:

- Adopt plans to protect surface and groundwater connectivity.

  Strategic Action Plan:

  - Develop water resources contiguity or conjunctive plan.
  - Establish mechanisms to safeguard the hydrological and hydrogeological functions connecting surface and groundwater.

Target 12: Adopt economic measures to value water resources

Strategy:

- Establish methods to value water resources.

  Strategic Action Plan:

  - Identify best practices in the valuation of water resources including water resources pricing and cost recovery (such as payment for ecosystems services).
  - Determine options for economic valuation of water resources amongst others according to types, location and condition.

- Recommend fiscal and financial incentives.

Strategy:

- Ensure that the full costs of rehabilitation, remediation and restoration of water resources and water bodies are fully captured in penalising polluters.

Strategic Action Plan:

- Establish methods for cost determination and recovery.

Target 13: Adopt measures to determine optimum water quality and yield

Strategy:

- Determine measures to ensure water availability and quality at all water bodies.

Strategic Action Plan:

- Prioritise uses based on classification according to needs and capacity through formulation of time-bound prioritisation plans.
- Identification and isolation of water resources stress factors, including determination of effect of single and multiple use.
- Identify and develop measures to address threats from contamination and pollution by controlling pollution at source, non point sources as well as transboundary pollution.
- Optimise abstraction rate without compromising sustainability of water resource.
- Integration of qualitative and quantitative aspects related to surface and groundwater taking into account the natural flow conditions or water within the hydrological cycle to ensure that abstraction rates do not exceed groundwater recharge rates.

Target 14: Adopt measures to implement water demand management nationwide

Strategy:

- Determine mechanisms to put into effect water demand management nationwide.

Strategic Action Plan:

- Identify options to incorporate water demand management in existing regulatory and administrative arrangements.

4.3 Policy Directions for Core Area 3: Partnerships

Water resources governance requires the collective action of all stakeholders, which does not only include government mandate holders. The central idea here is to give effect to integrated approaches already adopted in Malaysia such as IWRM, IRBM, ISMP, ICZM, ILM and IFM. These integrated approaches must be adopted nationwide, and key to adoption is integrating governance measures. What is important to note here is that through collaboration and partnership, the task of governing water resources can be shared. Effective governance requires structured mechanisms and platforms as well as processes to facilitate involvement

and participation. Important too are the processes that provide the means to get involved, participate and collaborate.

Thrust 7: Stakeholder Inclusiveness and Engagement

Target 15: Establishment of mechanisms for formal and informal consultation on matters related to water resources

Strategy:

- Identify stakeholders and clarify roles as well as responsibilities.

  Strategic Action Plan:
  - Identify and profile stakeholders.
  - Identify common objectives, goals and targets for local water resources use and conservation.
  - Identify and profile roles and responsibilities and options for shared responsibilities and collaboration.

Strategy:

- Develop means and measures for consultation.

  Strategic Action Plan:
  - Identify channels of formal and informal communication networks.
  - Identify options to strengthen collaborations, consultations and stakeholder engagement platforms and processes.
  - Develop consultation processes in local water plan development for integrated and concerted actions related to sustainable use and conservation of water resources.

Thrust 8: Shared Water Resources Governance

Target 16: Develop framework for stakeholder collaboration in water resources governance

Strategy:

- Determine means, measures and approaches for collaborative governance.

  Strategic Action Plan:
  - Identify processes and procedures that can be integrated to ensure shared governance of water resources.
  - Identify options for the formation of formal and informal shared and collaborative partnership platforms.
  - Identify channels of formal and informal communication networks.
  - Review and reconcile the prerequisites in adopted and accepted approaches for water resources conservation and management such as IWRM, IRBM, IFM, ILM etc.

- Identify and implement on pilot basis joint projects that promote accepted approaches for water resources management such as IWRM and IRBM.
- Strengthen programmes on awareness and the need for shared responsibility.
- Identify platforms for resolution of conflicts and competing interests.

4.4 Policy Directions for Core Area 4: Capacity Building and Awareness

Efforts to secure and sustain water resources as well as engage stakeholders will not be able to take effect if the capacity to carry out what is intended is lacking. Key here is the need to develop and train stakeholders, particularly government stakeholders, to ensure that they are equipped and trained to govern water resources in their entirety. Crucial too is the need to bolster the know-how and the how to. Investments must be made to encourage continuous research, development and innovation, as well as forging of partnerships with institutions of higher learning, research based institutions and NGOs.

Thrust 9: Capacity Building and Awareness

Target 17: Build capacity of key water resources stakeholders

Strategy:

- Identify capacity building needs and options.

Strategic Action Plan:

- Identify capacity building needs suited to type and scale and demand.
- Invest in research and development programmes.
- Formulate training programmes with institutions of higher learning, training institutes and NGOs.

Strategy:

- Develop programmes and activities to help build capacity including expertise and skill.

Strategic Action Plan:

- Formulate education, training and research programmes with local institutions of higher learning, training institutes and NGOs.
- Provide funding and research grants.

Target 18: Improve understanding and awareness on the importance of water resources security and sustainability

Strategy:

- Strengthen existing awareness programmes and campaigns to suit goals for water resources security and sustainability.

Strategic Action Plan:

- Identify platforms for effective engagement of the media and stakeholders.

- Formulate programmes or activities to suit particular target groups or situations or needs.
- Create recognition programmes for individuals and entities that help promote water resources security and sustainability.

DRAFT POLICY OVERVIEW

Summary

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
1. Water Resources Security	1. Water Resources Intelligence	1. Develop a comprehensive water resources information system	1. Conduct periodic consolidation and update existing scientific and technical data	1. Identify existing scientific and technical data available related to water, water resources, use and users	1. Number and types of data	Comprehensive information on water resources
				2. Identify repositories and repository holders	2. Number of repositories and list of repository holders	
			2. Establish a system for continuous analysis or synthesis of scientific and technical data	3. Identify and adopt methods and processes for continuous analysis and synthesis of scientific and technical data	3. Number and list of methods and processes	
		2. Strengthen database framework	3. Create a database framework and establish information networks	4. Review existing database framework, identify gaps, revise scope and coverage	4. List of databases	National water resources database framework
				5. Review existing evaluation, analysis and review methods	5. List of updated techniques and methods	
				6. Establish processes for information provisioning, collection, cataloguing and management	6. List of catalogues	
			4. Establish communication framework between key stakeholders	7. Develop a profile of stakeholders and existing information database	7. List and number of stakeholders	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
				8. Provide mechanisms for sharing of information and access between stakeholders	8. Number of mechanisms set up	
		3. Standardise multiple scientific processes and methods related to evaluation and analysis of state, status and condition of water resources	5. Introduce uniformity in the practices related to water resources evaluation and analysis	9. Review existing and develop new criteria for water resources state, status and condition evaluation and analysis	9. List and number of criteria used 10. Number of criteria standardised	Standardised processes and methods related to evaluation and analysis of state, status and condition of water resources
	2. Water Resources Integrity	4. Set national standards to determine thresholds for water resources to protect their availability and integrity of water bodies	6. Improve and develop measures to determine threshold and yield of water resources and integrity of water resources bodies	10. Profile methods and measures used to determine threshold and yield	11. Profile of methods and measures	National water resources standards
				11. Develop system to consolidate information to establish national standards and parameters for setting threshold and yield levels for different water resources types and water resources bodies	12. System to consolidate methods and measures	
			7. Develop national water resources related standards (e.g. quality, volume, environmental flow and water body health)	12. Review, revise and reconcile current standards for determining integrity and health of water resources	13. Number of review processes	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
					14. List of national standards for different water resources type and bodies	
		5. Reduce vulnerability of water resources to impacts and threats as well as strengthen adaptability to ecosystems and physical changes	8. Identify all forms of threats, impacts and hazards that affect water resources and bodies including threats, hazards and impacts ensuing from water bodies	13. Identify existing and emerging threats to and from water resources as well as water bodies	15. List of threats and impacts	Water resources vulnerability reduction plans and programmes
				14. Identify options and measures to reduce, mitigate and remove stress, threats, impacts and risks including transboundary risks, threats, impacts and hazard events	16. List of options and measures according to threat, impact and water resources type as well as location	
				15. Determine measures to aid adaptation of water resources to threats and emerging threats e.g. climate change and disasters	17. List of measures	
				16. Identify and develop water resources conservation plans for high risk areas	18. List and number of plans according to area	
				17. Identify options for ensuring resiliency of water resources from stress, threats, impacts, hazard and disaster events	19. List of options to strengthen resiliency of water resources	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
		6. Develop water resources conservation plans for strategic, sensitive and critical water resources areas and bodies	9. Determine resiliency of water bodies and areas to stress, risks, impacts and hazard events	18. Profile characteristics and nature of stress, risks, threats and hazards	20. Profile of stress, risks, threats and hazards characteristics	Water resources conservation plans
				19. Identify water resources conservation options, targets and action plans	21. List of options, and targets 22. Number of action plans	
				20. Identify levels and classifications of sensitivity and delineate sensitive areas and zones	23. Number of areas or zones classified	
				21. Identify key catchment areas and zoning options		
			10. Determine measures based on adaptability for controlled development in areas earmarked for development	22. Profile measures to aid adaptability	24. List of measures	
				23. Develop water resources sensitivity database and maps	25. Number of maps and databases	
				24. Incorporate data related to sensitivity in physical and national development planning processes, including the evaluation, review and assessment of development programmes and projects	26. List or number of data or information incorporated 27. Number of plans or programmes or projects with incorporated data or information	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
	3. Use of Alternative Water Resources and Sources	7. Optimise options for alternative, conjunctive or contiguous use of different water resources types to reduce stress on existing sources	11. Explore different options for alternative uses of different types of water resources	25. Identify alternative or conjunctive water resources options and suitability of use	28. List of options 29. Suitability rankings	Plans for alternative use of different water resources types
			12. Promote efficiency and reduce dependency on stressed water resources	26. Review, enhance or develop plans and procedures to address stressed water resources in times of threats or crisis	30. Number of plans or procedures for water resources use in times of threats or crisis	
	4. Water related Disaster Risk Reduction, Preparednes and Response	8. Adopt a national Disaster Risk Reduction, Preparedness and Response plan for water resources to introduce measures for preparedness and response, as well as reduction of risks and threats of disasters from and to water resources	13. Develop national level scientific assessment procedures for risk, threat and hazard determination, as well as preparedness and response needs for water resources	27. Identify potential disaster events	31. List of events	National and State Level Water Resources Disaster Risk Reduction, Preparedness and Response Plan
				28. Identify areas and scale of potential impacts and risks	32. List and number of areas	
				29. Develop risk assessment procedures	33. List of procedures	
			14. Develop disaster risk reduction, preparedness and response plans for water resources at National and State level.	30. Identify response needs and options for alternative water resources to supplant affected water resources	34. List of alternative sources	
2. Water Resources Sustainability	5. Criteria for Water Resources Characteri sation	9. Adopt national criteria for water resources characterisation and standards	15. Establish uniform measures, terms, standards and guidelines	31. Develop uniform use of terms to characterise water resources	35. List of use of terms and criteria	Uniform Criteria and Characterisation of Water Resources
				32. Review, profile and reconcile various water resources related standards	36. List of standards	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
	7. Conservation and Protection of Water Resources and Bodies, both natural and artificial	10. Determine priorities for water resources use, particularly in times of crisis or threat.	16. Develop criteria to determine water resources use priority	33. Identify key users and uses	37. List of key users 38. List of key uses	Criteria to determine priority of water resources use
				34. Identify key water resources use areas	39. List of areas	
				35. Develop allocation and management plan for water resources based on demand priority and resource availability	40. List and number of plans	
		11. Protect condition and state of water resources, catchment and bodies	17. Adopt plans to protect, rehabilitate and conserve water resources, catchments bodies and surrounding areas	36. Develop protection plans for conservation of water resources, catchments and bodies to sustain the water resources, including rehabilitation and improvement covering the ecological, physical systems and aesthetics aspects	41. Number of plans	Water resources protection plan
			18. Adopt plans to protect surface and groundwater connectivity	37. Develop water resources contiguity or conjunctive plan	42. Number of plans	
				38 Establish mechanisms to safeguard the hydrological and hydrogeological functions connecting surface and groundwater	43. List of mechanisms used	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
		12.Adopt economic measures to value water resources	19. Establish methods to value water resources	39. Identify best practices in the valuation of water resources including water resources pricing and cost recovery (such as payment for ecosystems services)	44. List of best practices	Economic measures for water resources valuation
				40. Determine options for economic valuation of water resources amongst others according to types, location and condition	45. List of valuation techniques	
				41. Recommend fiscal and financial incentives		
			20. Ensure that the full costs of rehabilitation, remediation and restoration of water resources and water bodies are fully captured in penalising polluters	42. Establish methods for cost determination and recovery	46. List of methods	
		13.Adopt measures to determine optimum water quality and yield	21. Determine measures to ensure water availability and quality at all water bodies	43. Prioritise uses based on classification according to needs and capacity through formulation of time-bound prioritisation plans	47. Number of classifications	Methods and Measures for optimum water quality and yield

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
				44. Identification and isolation of water resources stress factors, including determination of effect of single and multiple use	48. List of stress factors and effects	
				45. Identify and develop measures to address threats from contamination and pollution by controlling pollution at source, non point sources as well as transboundary pollution	49. List of measures	
				46. Determine methods and measures to help optimise abstraction rate without compromising sustainability of water resources	50. List of methods or techniques	
				47. Integrate qualitative and quantitative aspects related to surface and groundwater when taking into account the natural flow conditions or water within the hydrological cycle to ensure that abstraction	51. List of programmes or plans or guidelines	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
				rates do not exceed groundwater recharge rates		
		14. Adopt measures to implement water demand management nationwide	22. Determine mechanisms to put into effect water demand management nationwide	48. Identify options to incorporate water demand management in existing regulatory and administrative arrangements		
3.Partnerships	7. Stakeholder Inclusiveness and Engagement	15. Establishment of mechanisms for formal and informal consultation on matters related to water resources	23. Identify stakeholders and clarify roles as well as responsibilities	49. Identify and profile stakeholders	52. Profile of stakeholders, and list of objectives, goals and targets 53. Number of meetings and consultations	Establishment of mechanisms (platforms and processes) for formal and informal consultation on matters related to water resources
				50. Identify common objectives, goals and targets for local water resources use and conservation		
				51. Identify and profile roles and responsibilities and options for shared responsibilities and collaboration	54. List of roles and responsibilities	
			24. Develop means and measures for consultation	52. Identify channels and processes of formal and informal communication networks	55. List and number of networks	
				53. Identify options to strengthen collaborations, consultations and stakeholder engagement platforms and processes	56. List of collaboration programmes or activities	
				54. Develop consultation processes in local water plans development for	57. Number of plans with built in consultation processes	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
				integrated and concerted actions related to sustainable use and conservation of water resources		
	8. Shared Water Resources Governance	16. Develop framework for stakeholder collaboration in water resources governance	25. Determine means, measures and approaches for collaborative governance	55. Identify processes and procedures that can be integrated to ensure shared governance of water resources	58. List of processes and procedures	Shared Water Resources Governance Framework
				56. Identify options for the formation of formal and informal shared and collaborative partnership platforms	59. List or Number of partnerships	
				57. Identify channels of formal and informal communication networks	60. List or number of networks	
				58. Review and reconcile the prerequisites in adopted and accepted approaches for water resources conservation and management such as IWRM, IRBM, IFM, ILM etc.	61. List of approaches 62. List of approaches reconciled 63. List of reconciliation processes or activities related	
				59. Identify and implement on pilot basis joint projects that promote accepted approaches for water	64. List of projects and programmes	

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
				resources management such as IWRM and IRBM		
				60. Strengthen programmes on awareness and the need for shared responsibility		
				61. Identify platforms for resolution of conflicts and competing interests	65. Number of platforms	
4. Capacity Building and Awareness	9. Capacity Building and Awareness	17. Build capacity of key water resources stakeholders	26. Identify capacity building needs and options	62. Identify capacity building needs suited to type and scale and demand	66. List of capacity building needs	Capacity building and awareness programmes
				63. Invest in research and development programmes	67. List of investments and areas invested in	
				64. Formulate training programmes with institutions of higher learning, training institutes and NGOs	68. Number of training programmes 69. Number of partnership arrangements	
			27. Develop programmes and activities to help build capacity including expertise and skill	65. Formulate education, training and research programmes with local institutions of higher learning, training institutes and NGOs.	70. Number of programmes	
				66. Provide funding and research grants		
		18. Improve understanding and awareness of on	28. Strengthen existing awareness programmes and campaigns to suit	67. Identify platforms for effective engagement of the media and	71. List of platforms	Awareness programmes

Core Area	Thrust	Target	Strategies	Strategic Action Plan	'Measurable' output / outcome	Intended results
		the importance of water resources security and sustainability	goals for water resources security and sustainability	stakeholders		
				68. Formulate programmes or activities to suit particular target groups or situations or needs	72. Number of programmes 73. Number of activities	
				69. Create recognition awards for individuals and entities that help promote water resources security and sustainability	74. Number of programmes	

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
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SECTION 3

LEGISLATIVE FRAMEWORK FOR IWRM

Section 3 LEGISLATIVE FRAMEWORK FOR IWRM

3.0 REVIEW OF THE CONSTITUTIONAL POSITION RELATED TO IWRM

3.1 INTRODUCTION

The Federation of Malaysia is governed by a written constitution. The Constitution is the supreme law in the country and any law made in contravention of the latter would be void. The relationship, powers and responsibilities of the Federal and State Governments are stipulated in the Constitution. The Ninth Schedule sets out the specific jurisdiction of each party in three legislative lists namely the Federal, State and Concurrent Lists. As the name suggests the Federal (List I) and State List (List II) spell out the specific powers and jurisdiction of the respective parties. The Concurrent List (List III) bestows powers on both parties to manage some issues. It must also be noted that both Sabah and Sarawak, which joined the Federation later, are bestowed with additional powers as contained in Lists IIA and IIIA. The distribution of powers related to the management of water resources are itemised in **Annex 3.1**.

3.2 MALAYSIAN CONSTITUTION – GENERAL CONSIDERATIONS

(i) As mentioned in Annex 3.1, it may generally be stated that "water" is largely a State matter. This jurisdiction would include rivers, lakes, streams, and water beneath the surface of the land. However, it is certainly not true that water is exclusively a matter within the sole jurisdiction of the State. The Federal Government has powers over specific matters such as federal works including water supplies and interstate rivers and canals except those which are wholly within one State or are regulated by an agreement between the States concerned. Other aspects of water resource utilization such as hydropower generation, navigation, marine fisheries and mining also are within Federal jurisdiction. The Federal Government may also make laws related to items listed in the Concurrent List and these include water supplies, town and country planning, drainage, wildlife and rehabilitation of land with soil erosion. Of importance is Parliament's power to make laws with respect to any matter in the State List for the purpose of **promoting uniformity of laws** of two or more States and to implement international conventions and agreements.

(ii) The power to make such laws, however, is subject to other conditions or restrictions imposed by the Constitution. For example Article 78 of the Constitution stipulates that any law made by Parliament which restricts the right of a State to the use of any river wholly within that State, shall not have effect unless it is approved by the State Legislature. Despite these restrictions, it is remarkable that the Waters Act 1920 has remained on the list of statutes and in force in almost all states in the Peninsular for almost a century. It may be argued that this Legislation pre-dates the Constitution and therefore should not be taken into account. However the Federal Government has, more recently, enacted legislation on matters arising within the State List. Such laws include the Land Conservation Act, Streets Drainage and Building Act, Local Government Act and National Land Code. Still most of these laws date back to the

seventies or earlier. The political scenario has changed considerably and it is generally acknowledged that it will be more difficult for Parliament to legislate on similar matters today. Even if such legislation is passed by Parliament, its implementation in individual states will entirely remain within the sole discretion of the latter governments.

(iii) The State Authorities, by virtue of the fact that water and matters related thereto such as land and rivers are largely within their jurisdiction, would appear to be in a better constitutional position to control and regulate matters on the ground pertaining to the integrated management of water resources in their respective states. However the reality is that problems and issues related to water cannot be left solely to be handled individually by 14 States. Disparate and different approaches to the management of water resources has given rise to many issues as mentioned in various parts of this Report. At the very least State Governments do require Federal support in capacity building and financing to ensure that their water resources are managed well and to face the challenges that will be posed increasingly by climate change. [1] That the support of the Federal Government is vital is shown in both the review undertaken on comparative practices internationally in countries like Brazil and Australia as well as the experiences of states such as Selangor and Sabah.

(iv) In order for the Federal Government to provide such support to State Governments it will be necessary that every State adopts and implements the national policy that is proposed to be formulated under this Study and which has been agreed to by all stakeholders. It also follows that there must be greater transparency and accountability in the management of water resources at every level of governance. The question arises as to whether the Federal Constitution should be amended to enable the Federal Government to play a more significant role in issues related to IWRM. The Malaysian Federal Constitution was amended quite recently to introduce the issue of water supplies under the Concurrent List. However, a similar proposal may not even be successfully accepted at the various levels through which it will have to be considered and approved by all States. An amendment to the Constitution is also not practical as there are critical elements of IWRM, which will continue to remain within the exclusive jurisdiction of the State in particular aspects related to land and rivers. This option shall not therefore be further pursued by this Study.

3.3 FEDERAL JURISDICTION

(i) Part VI of the Federal Constitution, entitled "Relations between the Federation and the States," details the distribution of legislative and executive powers between the Federation and States. Article 73 entitles Parliament to make laws for the whole or any part of the Federation having effect outside as well as within the Federation. (Article 73 also enables each State to make laws for the whole or any part of that State). The Federal Constitution enumerates the legislative power of the Federal Government in List 1 of the Ninth Schedule. Parliament may make laws (Article 74(1)) with respect to any of the matters enumerated in the Federal List (List 1, Ninth

1 Item 12, List IIIA, Supplementary to Concurrent List, Federal Constitution.

Schedule) or the Concurrent List (List III, Ninth Schedule). The Federal List, under which the Federal Government has sole jurisdiction to make laws, contains several items on issues related to the integrated management of water resources. These Items are identified in Table 1, Annex 3.1.

(ii) Item 1 of the Federal List deals with the power of the Federal Government over matters related to external affairs, international relations and treaties. Rightfully relations with other countries and international conventions are within the exclusive jurisdiction of the Federal Government. There are several rivers where such international relations may arise including Sg Golok in Kelantan and Sg Limbang in Sarawak. The transfer and sale of water to Singapore by the State of Johor is another matter that will require Federal involvement. On the international front the obligations imposed by the Rio Summit including the Conventions on Biodiversity and Climate Change are the responsibility of the Federal Government. Article 76 of the Constitution further clarifies Federal rights in this respect. Parliament may make laws to implement any treaty, convention or agreement in any state even if the matter concerned is enumerated in the State List.[2] Laws based on international conventions have been enacted by Parliament in the past. However most of these laws have traditionally been on matters directly related to heads under the Federal List.[3] The Federal Government would be obliged, in order to fulfil its international obligations, to enact laws impacting on some or all states.

(iii) Item 9 refers to shipping, navigation and fisheries. This item includes shipping and navigation on the high seas, tidal and inland waters, safety of navigation, ports and harbours and maritime and estuarine fishing and fisheries (excluding turtles). Item 10 further deals with communications and transport including roads or ferries (if declared to be Federal); regulation of traffic by water (other than on rivers outside harbour areas wholly within one State) and carriage of passengers and goods by water. The Federal Government thus has powers over shipping and navigation on all waters including within port limits. These powers however are circumscribed when shipping and navigation occurs on rivers wholly within one state. The Federal Government may regulate traffic including the carriage of goods and passengers except on rivers. Ports and harbours in Peninsular Malaysia (including those declared to be Federal in Sabah and Sarawak) are largely within Federal jurisdiction. One must note that in East Malaysia, shipping below 15 tons may not be regulated by the Federal Government.[4] Further the regulation of traffic by water in ports or rivers in East Malaysia (except traffic within Federal ports) is within State jurisdiction.[5] Maritime and

2 Article 76 - "Parliament may make laws with respect to *any matter in the State List* for the purpose of implementing any treaty, agreement or convention.... or any decision of an international organization...".

3 Examples of such laws include the Merchant Shipping (Oil Pollution) Act, 1994, Exclusive Economic Zone Act, 1984.

4 Item 12, List IIIA, Supplementary to Concurrent List, Federal Constitution.

5 Item 15, List IIA, Supplementary to State List, Ibid.

estuarine fishing and fisheries (excluding turtles) are also within Federal jurisdiction in Peninsular Malaysia.[6]

(iv) Item 11 bestows the Federal Government with jurisdiction to undertake Federal works and power. Such works may include water supplies, rivers and canals (except on those wholly within one State or regulated by an agreement between all the States concerned) and production, distribution and supply of water power. It must be noted here that in Sabah and Sarawak, pursuant to List IIIA, hydroelectric power is included within the Concurrent List. Item 11 enables the Federal Government to engage exclusively in hydroelectric power and Federal works. This does not however mean that the Federal Government can unilaterally site a dam on any river or carry out works on any land without the prior approval of the State Government for the siting and use of the river, water and land.

(v) There are other Items in the Federal List, indirectly related to IWRM, which should be included in this review – see Annex 3.1. Item 7 relates to Finance including taxes and loans to states. It must be noted that States have very limited sources of revenue, water rates being but one of them. Item 8 relates to development of minerals and mining which will have an impact on water quality if not properly addressed. Items 12 and 13 empower the Federal Government with powers to undertake scientific and technical research and the promotion of special studies and research in education. Such educational activities and research may be important to address key issues related to the continued development of IWRM in the country. Item 16 relates to the welfare of aborigines who often live within catchment areas. They will be an important stakeholder in IWRM. Item 20 relates to the control of agricultural pests and prevention of plant diseases – the use of pesticides and fertilizers will impact on water quality in general and ground water in particular. Finally Item 25A empowers the Federal Government on matters related to tourism and in this respect eco tourism is becoming an important activity within many water catchments.

(vi) Pursuant to Article 76(1), Parliament has additional powers to make laws with respect to any matter enumerated in the State List but only under the following circumstances:

a) for implementing any treaty, agreement or convention between the Federation and any other country, or any decision of an international organization;

b) for the purpose of promoting uniformity of laws of two or more States; or

c) if requested by the Legislature of any State.

Any law made pursuant to Article 76(1)(b) or (c) shall not come into operation in any State until it has been adopted by the State legislature after which the law shall be deemed to be a State law. Parliament has enacted laws pursuant to Article 76(1) (a)

6 Item 9(d), List 1, Ibid.

and (b). The Bio Safety Act 2007 (regulating the release, importation, exportation and use of living modified organisms) and New Plant Varieties Act, 2004 (relating to protection of breeders of new plant varieties including by local farmers, communities and indigenous people) are two such examples where laws have been made by Parliament by virtue of Article 76(1)(a).[7] Parliament has also, under Article 76(1)(b) made several laws to promote "uniformity of laws" among states. These include the National Land Code, Land Conservation Act, National Forestry Act, Town and Country Planning Act, Street Drainage and Building Act and Local Government Act. There are many reasons as to why the Federal Government should enact laws to promote uniformity among states in IWRM. The existence of the Waters Act 1920 (which applies to some states in Peninsular Malaysia) by itself proves that such a need was felt even before the country became independent. Water is also a basic human right and no state or person should be deprived of this right. Without water human subsistence or existence will not be possible. With no exception, almost every state in Malaysia (or at least some part of the State), has faced water shortages in recent times. Climate change and extreme weather patterns may further exacerbate the situation. It is the duty of the Federal Government to ensure water security to every person in the country. Some states have forged ahead and enacted their own water resources law whilst others are considering doing so. This disparate approach will certainly add to the complexity of managing water resources at every level and particularly so at the national level. It is timely that the Federal Government should consider and promulgate a national policy and law that will promote uniformity among States in the adoption of IWRM practices.

(vii) Article 76(1)(b) is qualified by clause (4) of the Article. Laws made by Parliament to ensure uniformity of law and policy on matters related to land and local government may come into force in any State without the need for adoption by the legislature of that State. Neither can the State make any amendment to the legislation. Thus the National Land Code, Land Conservation Act, Street Drainage and Building Act, Town and Country Planning Act and Local Government Act were adopted and implemented in all states in Peninsular Malaysia without any amendments to the Legislation.[8] Legislation pertaining to all other matters is required to be adopted by the legislature of the State before it can come into effect in the State. The law shall thereafter be considered to be state law. The State may also, in adopting the Act, make any amendments to the law. The National Forestry Act and Waters Act are examples of the latter form of legislation.

(viii) There are other Articles in the Constitution which are relevant to the relationship between the Federal and State Governments on water resource management. Chapter 2 of the Constitution deals with the "Distribution of Executive Powers". Article

7 To implement provisions in the International Convention on Biodiversity, 1992 and International Treaty on Plant Genetic Resources for Food and Agriculture, 2001. Malaysia became a party to these Conventions in 1998 and 2003 respectively.

8 However any legislation made by Parliament pursuant to Article 76(4) is qualified by Article 80(3). In the event the legislation bestows executive powers on the Federal Government, then it shall operate in a state only after it is approved by the Legislative Assembly of the State. Further Article 95D exempts Sabah and Sarawak from the application of Articles 76(1)(b) and 76(4).

80(1) broadly states that both the Federal and State Governments shall have executive powers over such matters as provided by their respective laws. The executive authority of the Federal Government does not extend to any matter in the State List except as provided by Articles 93-95.[9] Both the Federal and State Governments may provide for the performance of any function by the authorities of the other including arrangements for sharing of costs.[10] The Federal Government may also empower any authority within a State to administer any provisions of a Federal Law and for this purpose can confer powers and duties on any authority of the State.[11] In the latter event the Federal government shall make such payments to the State as may be mutually agreed.[12] A general obligation is imposed on every state to exercise its executive authority in a manner that will ensure compliance with any federal law and "not to impede or prejudice the exercise of the executive authority of the Federation". [13]

(ix) Article 92 is an interesting clause that recently has been used to set up the Regional Development Authorities. It provides for the declaration of a Development Area for putting into effect a Development Plan that is conducive to national interest notwithstanding that the plan may impinge on matters which are within State jurisdiction. The Plan has to be passed by law and "development plan" means "a plan for the development, improvement, or **conservation of the natural resources** of a development area, **the exploitation of such resources** or the increase of means of employment in the area." The Federal Government may require the reservation of land for the purposes of the development plan and any loss of annual revenue or diminution of value of the land to the State shall be made good by the Federation. A mechanism for the sharing of costs and revenue received by the Federation with the State from the operation of the development plan including dispute settlement is provided for in this Article. It is a moot question as to whether the Federal Government could, for example, use this Article to declare water catchment areas as Development Areas. The ambit of this Article certainly does not preclude the possibility that the development plan may be used for the "conservation of the natural resources and the exploitation of such resources". It may be concluded that the possibility of the Federal Government declaring critical water catchment areas as Development Areas (particularly those that straddle more than one State) is certainly a distinct possibility that must be considered when all else fails at the State level. Perhaps the States too may welcome this approach as they would receive compensation and a share of any revenue generated from the Development Area.

9 Federal surveys, advice to States and inspection of state activities.

10 Article 80(5)

11 Article 80(4)

12 Article 80(5)(6)

13 Article 81

Note also that the Federal Government may declare any area in Sabah and Sarawak only with the concurrence of the State.[14]

(x) Chapter 6 deals with Federal surveys, advice to States and inspection of State activities. Article 93 authorises the Federal Government to undertake inquiries, surveys and collect and publish such statistics as it thinks fit on all matters and it shall be the duty of the State Government to assist the Federal authorities in the execution of these powers. Article 94 also enables the Federal Government to conduct research and the giving of advice and technical assistance to any State including the provision of education, publicity and demonstration on any matter. The State Government is obliged to accept any professional advice given on agricultural and forestry matters by Federal authorities. Federal authorities may also inspect any state department or work carried out by the department and report their findings to both Governments. Such inspection however may not be carried out on matters which are within the exclusive legislative jurisdiction of a State.

(xi) Part VII of the Constitution regulates the financial aspects of Federal-State relationship. Article 96 spells out that taxes and rates shall be levied only by Federal Law. The Federal Government shall pay a capitation grant and state road grant to every State for each financial year.[16] Parliament may also make specific grants to any State for specific purposes on such terms and conditions as may be determined by law. It must be noted that States have very few sources of revenue, the largest source being related to the development and use of land. Thus land reserved for catchments by any State essentially means that the State is deprived of the possibility of earning revenue from the utilization of such land. An alternative source of revenue that is being increasingly recognized by most States is from the exploitation of water resources. Water rich States such as Johor, Pahang and Perak may earn revenue from the sale of water to other states and Federal users (such as for Hydro-electric power, irrigation and ecosystem services).

3.4 STATE JURISDICTION

(i) Article 73 empowers each State to make laws for the whole or any part of that State. The State legislature may make laws only for that State. The Federal Parliament may however make laws for all states within the Federation. States may make laws with respect to any of the matters enumerated in the State List (List II, Ninth Schedule) or Concurrent List.[17] For Sabah and Sarawak, in addition to the powers enumerated in the State List, the two States are bestowed with additional jurisdiction under the Constitution. These powers are enumerated in List IIA and IIIA.

14 Article 95E(3)

15 Article 95. Also Article 95E(4) makes qualification of its application to Sabah and Sarawak.

16 Article 109

17 Article 74(2), Federal Constitution.

(ii) As can be seen from Table 2, Annex 3.1, State Governments in general appear to have direct jurisdiction over water resources and matters connected therein. Item 2 of the State List empowers States to deal with all matters related to Land including land tenure, utilization, easements, improvement and soil conservation. Mining on such land shall be subject to permits and licenses. The acquisition of land, transfers, leases and charges shall also be under State jurisdiction. It may be said that, with very few exceptions (such as Federal Land or Regional Development Land), land is a matter wholly within the purview of State authorities. This jurisdiction is further entrenched by Item 3 - Forestry and Agriculture. Forestry is critical to the issue of maintenance of appropriate catchment areas to ensure adequate generation and conservation of water resources. Extensive use of land for agriculture, run off from such land and utilization of water for agriculture are also important factors in IWRM.

(iii) Item 6 of the State List empower States to legislate on "State works and water". It is to be noted that the heading of this Item contains the word "water". The Header could be interpreted to read as "State Works" and "State Water". This interpretation may be considered valid as Item 6(c) again mentions "...water (including rivers and canals), control of silt; riparian rights" as specific items and not in the context of State Works. There is the proviso within Item 6(c) making it subject to the Federal List. As mentioned above the Federal List contains reference to water only in relation to shipping and navigation on the high seas and within ports and harbours, regulation of traffic, carriage of goods and passengers largely within the latter areas and Federal works including water supplies. Item 6(c) further enables States to regulate sedimentation and siltation of rivers and riparian rights. The regulation and control of turtles and riverine fisheries is also within State jurisdiction.18 Further, Article 78 of the Constitution imposes a restriction on any law made by Parliament in relation to rivers wholly within a State. Any such law which seeks to restrict the right of a State to the use of the river shall not have effect unless it is approved by the State Legislature.

(iv) There are other items in the State List which are indirectly related to IWRM. Item 4 on Local Government and administration is relevant as local authorities play vital roles in the planning and utilization of land, waste management, environmental planning and management and drainage. Item 10 on the collection of statistics and information is important to data and information management for IWRM. Further there are additional powers for Sabah and Sarawak under List IIA (see Table 2, Annex 3.1). Article 76A empowers Parliament to vest authority on the States to make laws on any item in the Federal List, subject to such terms and conditions that it may impose. Thus Parliament may, for example, vest State legislatures with the authority to make laws pertaining to transportation of goods and passengers subject to certain terms and conditions. Further Article 77 vests residual powers on States to make laws on any matter not specifically enumerated in any of the Lists set out in the Ninth Schedule. Thus a State may make laws on issues like environment or biodiversity as these matters are not specifically mentioned in the Lists.

18 Item 12, List 2, Ibid

(v) Part 7 of the Federal Constitution sets forth financial provisions relating to Federal and State matters. Article 110 stipulates that the States shall receive all proceeds from taxes, fees and other sources of revenue specified in Part 3 of the 10th Schedule. Part 3 of the 10th Schedule assigns revenue to the States from, among other sources, land, mines and forest fees, receipts in respect of specific services rendered by the department of State Governments and receipts in respect of raw water. Water rates are therefore a specific source of revenue assigned to the State Governments. Parliament however may, from time to time by law substitute for any source of revenue mentioned above, any other source of revenue of substantially equal value. In other words, if Parliament enacts a law that reduces or alters water rates presently collected by the State Governments, then Parliament would have to substitute this with another source of revenue of equal value.

3.5 CONCURRENT JURISDICTION

(i) Both the Federal and State Governments may make laws on items in the Concurrent List.[19] Article 80(2) however stipulates that the executive authority of the Federation does not extend to any matter enumerated in the Concurrent List except in so far as may be provided by Federal or State law. Thus, for example, if the Federal Government decides to exercise executive authority in drainage and irrigation matters then it would have to enact appropriate laws providing for such authority. In the event of any inconsistency between Federal and State laws, Article 75 provides that Federal law shall prevail. Article 79 stipulates specific procedures to be adhered to in the event a law is proposed to be made on an item in the Concurrent List. The presiding officer of the relevant legislative body (where the law is proposed to be passed) shall certify the proposed Bill. A mandatory period of four weeks shall pass for consultations to be held before the Bill can be proceeded with unless the presiding officer is satisfied that consultations have been held and proceeds on grounds of urgency.

(ii) The Concurrent List contains two main items which are directly related to water and these are "Drainage and Irrigation" and "Water supplies and services". There are however other items that are indirectly related to the management of water resources including protection of wild animals and wild birds; town and country planning; public health, sanitation and prevention of diseases; rehabilitation of mining land and land which has suffered soil erosion. In addition, List IIIB in relation to Sabah and Sarawak, provides concurrent jurisdiction over shipping (under 15 Gross Rated Ton), carriage of passengers and goods by such shipping; maritime and estuarine fishing; and production, distribution and supply of water power.

3.6 MECHANISMS FOR COORDINATION

(i) In order to have better coordination between the Federal and State Governments on matters related to land, finance and local government, the Constitution stipulates

19 Article 74, Ibid

formal mechanisms where both the Federal and State Governments are represented. Three Councils were established namely the National Land Council,[20] National Council on Local Government[21] and National Finance Council[22]. Of interest is the National Land Council whose function is to formulate policies, in consultation with the Federal/State Governments and the National Finance Council, for the promotion and utilisation of land for mining, agriculture, forestry or any other purpose and for the administration of any laws relating thereto.The State and Federal governments **shall** (with the exception of Sabah & Sarawak)[23] **follow** the policy so formulated. Either party may consult the Council on any matter related to the utilisation of land, proposed legislation related to land or the administration of such law and the Council shall advise the Government on such matters. The National Council on Local Government is similar in nature to the Land Council in its constitution. Its primary function is to formulate policy for the promotion, development and control of local government and the administration of laws related thereto and the parties shall follow the advice. It shall be the duty of the Federal and State Government to consult the Council on any proposed laws related to local government and the Council shall advise the party. The National Finance Council is chaired by the Prime Minister and comprised of representatives from each State and other Ministers as the Prime Minister may designate. The Federal Government shall consult the National Finance Council, inter alia, on matters such as assignment of taxes to States, making of development plans according to Article 92 and making of loans to States. The Federal Government may consult the National Finance Council on any other matter whilst a State Government may consult on any matter related to finance of the State.

(ii) The National Land Council (NLC) has the potential to play an important role on issues related to water resources as many IWRM issues are related to land use and town and country planning. The NLC also deals with issues related to forestry. The Federal Government has established several national councils such as the National Forestry Council (considered to be part of the NLC), National Biodiversity Council and National Water Resources Council (NWRC). Compared to the NLC and NLG, the decisions of these Councils cannot be enforced legally except by administrative fiat. It may be appropriate therefore that all major decisions of the NWRC, particularly if it is related to land, be brought for consideration and subsequent ratification by the NLC. Major decisions may be related to the formulation of new policies or laws or its implementation by Federal and State Governments and its various agencies. In this respect it should perhaps be noted that even some decisions of the NLC were not strictly adhered to by some States in the past.[24] The fact remains however that the decisions of the NLC are sanctioned by the Constitution and this should lead to greater compliance by all parties concerned. One way in which better compliance

20 Art. 91, ibid

21 Art. 95A, ibid

22 Art. 108, ibid

23 Article 95E, Ibid

24 Pg. 25-26, Federal State Relationships in Environmental Management, ISIS Malaysia, 1997

may be achieved is also through better monitoring of implementation of its decisions. This may require the formation of a permanent independent secretariat to the NWRC which could carry out the function of monitoring and reporting on the progress of implementation of decisions taken at the Council.

National Land Council

Chairman: Minister (Deputy Prime Minister currently chairs the Meeting).

Members: One member from each State and not more than 10 members from Federal Government.

Meetings: May meet as often as Chairman considers necessary but shall meet at least once a year.

Function: to formulate a national policy for the promotion and utilisation of land for mining, agiculture, forestry or any other purpose and for the administration of any laws relating thereto.

3.7 CONCLUSION

(i) In conclusion it may generally be stated that "water" is largely a State matter. However, it is certainly not true that water is exclusively a matter within the sole jurisdiction of the States. The Federal Government has powers over specific matters related to water resources. Besides it has an overriding obligation to ensure that water as a resource is utilized for the benefit of human beings and the environment. It is important to note that Parliament has powers to make laws with respect to any matter in the State List for the purpose of promoting uniformity of laws of two or more States and to implement international conventions and agreements.

(ii) The power to make such laws, however, is subject to other conditions or restrictions imposed by the Constitution. Further, the Federal Government cannot exercise executive authority over matters within the Concurrent List unless Federal laws are enacted specifically providing such authority. The Waters Act 1920 has remained on the list of statutes and in force in almost all states in the Peninsular for almost a century. It clearly shows that there was a need, even at that early stage, for greater uniformity among all states in their approach to management of the rivers. However, in recent times it is generally acknowledged that it will be more difficult for Parliament to legislate on similar matters today. However this does not negate the critical need for greater uniformity in the approach to and management of water resources in the Country particularly in the current context of growing economic complexity and linkages between States and huge demands on their resources.

(iii) The State Authorities, by virtue of the fact that water and matters related thereto such as land and rivers are within their jurisdiction, would appear to be in a better position to control and regulate matters on the ground pertaining to the effective management of water resources in their respective states. However it is a fact that water security

must be a national priority to the Federal Government and it cannot be left to be handled individually by 14 different states. Such disparate and different approaches to the management of water resources may well give rise to issues including the following:

a) Management of international issues, relationship between countries and implementation of international conventions and agreements will pose a challenge to the Federal Government when states adopt different approaches to management of these resources within their respective jurisdictions;

b) Interstate transboundary rivers will also pose challenges when two or more states adopt different and perhaps conflicting approaches to the management of a shared water resource and river;

c) Management of water resources requires an integrated and holistic approach impacting on many vital aspects of the resources' catchment including land use and activities within the catchments. A multitude of legislative approaches by different State Governments will lead to difficulties for third parties including investors to grasp and work within.

d) Different approaches and levels of importance may be ascribed by each state to different issues making it extremely difficult for national priorities and policies to be implemented and monitored.

e) Integrated management of water resources on a national basis will become hugely complex.

f) There is a possibility that eventually, disparate and uncoordinated approaches to management of water resources within Peninsular Malaysia may lead to mismanagement of resources, conflict and unsustainable development.

(iv) State Governments have very little sources of revenue with development and exploitation of land and its resources as the single most important source in most States. They will require Federal support in capacity building and financing to ensure that their water resources are managed well and are equipped to face the challenges that will increasingly be posed by climate change.[25] In order for the Federal Government to provide such support to State Governments it will be necessary that each State firstly implements the national policy. Each State (starting with those states with water resources) should also formulate and adopt a State policy on water resources which is consistent with the National Policy. To support the implementation of such a policy both legal and non-legal instruments should be adopted including a law to promote uniform practices in IWRM among all States in the country.

25 See article by NAHRIM, pg. 8, MyWp Newsletter, Issue No. 5, February 2010 on some effects of climate change in Malaysia.

(v) Finally the question arises as to whether the Federal Constitution should be amended to enable the Federal Government to play a more significant role in issues related to IWRM. The Federal Constitution has been subjected to many amendments in the past. The situation however is different now. In fact such a proposal may not even be successfully accepted at the various levels through which it will have to be considered and approved by all States. In our opinion such an amendment is also not practical as there are many other critical elements of IWRM which will continue to remain within the exclusive jurisdiction of the State in particular aspects related to land and rivers.

3.8 REVIEW OF CURRENT STATUTORY REGIME

3.8.1 Key Conclusions of the Detailed Review

(i) A detailed review of all relevant laws is included in **Annex 3.2 and 3.3**. Our main conclusions arising from this review may be summarized as follows-

a) Water resources are increasingly vulnerable to degradation and pollution. There is an urgent need for water resources to be used and conserved in a sustainable manner;

b) Water, despite the general perception in Malaysia, is a finite resource. Mismanagement of this essential element will have disastrous consequences on the Malaysian economy as well as the environment;

c) In general, existing Federal legislation do cover certain aspects of the management of water resources including use of water for certain purposes, its protection from pollution and to a certain extent, development planning. However these legislation are sectoral in nature and do not allow the adoption of measures for the integrated management of water resources. For example, current Federal legislation cover aspects related to :

- prevention and control of pollution of water;
- control of land use; and
- forest management.

However, these do not extensively and holistically cover issues such as the creation and management of river basins across administrative boundaries including use and conservation of resources therein;

d) Increasingly many States including Kedah, Melaka, Negeri Sembilan, Pahang, Sabah, Sarawak and Selangor have enacted State legislation that deal with aspects related to management of water resources. Some of these enactments, such as those in Kedah and Selangor, provide wide powers to the state authority or a state regulatory body to manage, control and protect water resources;

e) The State water resources enactments all differ in jurisdiction, scope and powers. There is also the issue of these enactments having gaps, conflicts and duplication with both other Federal and State laws;

f) The legislations reviewed recognize both Federal and State control of water resources within their jurisdiction but as water resources are not defined in most of these legislation in a comprehensive manner, the existing structure of control does not usefully permit the integrated management of water resources;

g) Water resources related functions are distributed by legislation amongst various Federal government agencies. There appears to be an absence of a strong coordinated centralized role as there is no legislative provision to require that certain activities shall recognize the management and protection of water resources or that decisions be coordinated amongst all the relevant authorities;

h) All matters relating to raw water sources including rivers and catchment areas still remain within the jurisdiction of the respective states and therefore are governed and regulated through State laws. With the coming into effect of the WSIA, aspects relating to water supply services is divided in that raw water before the extraction/intake point shall remain under the States jurisdiction whilst all matters beyond thereof will be under the jurisdiction of WSIA and the National Water Services Commission ("SPAN") under the SPAN Act; and

i) Due to the nature of the existing fragmented and segregated structure of the regulatory bodies and authorities involved directly or indirectly with water resources, there does not exist any standard, consistent, clear and comprehensive guidelines or policies on water resources for Peninsular Malaysia.

(ii) The current lack of Federal laws on IWRM and the continued disparate approaches adopted by State Authorities, if not properly addressed urgently, will lead to immense difficulty in the adoption of IWRM methodology and policies on a coordinated national basis. There is a need to formulate a law, which may be adopted by all States in order to establish greater consistency of approach and application in the implementation of IWRM on a national basis. Such a law should also enable the Federal authorities to implement their roles and responsibilities as provided for under the Constitution.

3.8.2 Key Challenges

(i) In order to frame an integrative legislative approach for governance of water resources the key challenges, moving forward, are:

a) to ensure greater consistency in approach and application of IWRM at all levels of governance, a key challenge will be to obtain the cooperation of every State to review their existing policies, legislation and institutions to implement an integrated national approach and consistent with global standards and approaches to IWRM;

b) whilst States need not give up existing powers over water resources there must be a willingness by all stakeholders to subscribe to and adopt a more consistent approach in line with national initiatives to promote greater consistency and uniformity of standards, methods and procedures;

c) the Waters Act 1920 is proof of the practicality of the approach advocated in paragraph (b). The challenge is to revise and update the latter legislation to be more consistent with current international approaches to IWRM and IRBM so that it will be viewed by the States as a model legislation that can be adopted, adapted and implemented by all States;

d) the successful implementation of IWRM by all States depends to a very large extent on the availability of sufficient expertise, manpower and funds. The State authorities require Federal support to implement IWRM. The challenge is to empower the Federal Government to provide such support which currently is not mandated by an integrated IWRM policy, plan or legislation;

e) the Federal legislation, in seeking to formalize appropriate avenues for the consideration and adoption of national policies, institutions and programs has to be mindful of the complexity of the issues related to IWRM, constitutional position and the need to empower a Federal agency to drive implementation of IWRM at the national level; and

f) The current sectoral consideration of issues related to water resources has resulted in the proliferation of many laws. The challenge in trying to adopt a uniform law will be to avoid, as much as possible, duplication and conflict with existing legislation and between various organizations. The new law must also leverage on existing State water resources enactments and other related legislation.

3.9 REVIEW OF COMPARATIVE PRACTICES IN SELECTED JURISDICTIONS

3.9.1 Introduction

(i) A detailed analysis of institutional and legislative arrangements in other jurisdictions is contained in **Annex 3.4**. The following countries were chosen whose practices are representative of global trends in IWRM or IRBM:

a) Indonesia;
b) EU;
c) Australia;

d) Brazil; and
e) Thailand.

Australia is a Commonwealth country with similar legislative traditions and a Federal structure similar to Malaysia. Brazil is also a Federation but with vast water resources and major rivers. It is also a developing country which has progressed significantly towards the adoption of a more unified and consistent approach to IWRM by all states within the nation. The EU was chosen as it has embarked on a significant effort to implement IWRM across the European Union in a well structured long term approach with appropriate milestones and performance indicators. Indonesia and Thailand are ASEAN members and our neighbours. They too have made significant progress and are part of the global effort to value and manage water resources in a more integrated manner.

3.9.2 Comparative Practices

(i) Every country in the List above started with the recognition that water resources are critical to the survival of the nation and a holistic approach must be adopted to the sustainable development, use and conservation of the resource. They addressed their own unique issues and developed appropriate policies, plans and programs to address those issues. In Australia, a water stressed country, a national agenda has been adopted for implementation by all States. The Murray Darling, the most significant source of water for the country, is a transboundary river that required cooperation of several states and the Federal authorities. The cooperative mechanism started as a committee to primarily manage allocation of water. The mechanism has progressively adapted over time. There is now a Ministerial Council with its own secretariat and wide ranging responsibilities of management and regulation of the Basin. The Indonesian approach was slightly different as a public corporation was given rights to manage, conserve and develop resources of a river (the Brantas River which is the most significant river in Java). Being a corporation which has to show its success, it took the obvious route of engineering works which "showed" physical improvement. That this was insufficient to manage the river basin was proved by the establishment of a Water Resources Committee chaired by the Vice Governor of the Province. Legislation is in place to ensure that all beneficiaries from the use of resources from the river contribute towards the upkeep of the river. New legislation is also being considered to ensure that polluters pay for the damage to the river. The EU Directive is perhaps the most ambitious (and, in our opinion, will probably be the most successful in the long term) as it is a comprehensive multilateral plan to implement IWRM in all member states. A key feature of the Directive is its bottoms up approach to IRBM planning placing stakeholder participation and engagement as a mandatory tool. In the United Kingdom River Basin Management Districts have been formed with a Liaison Panel made up of representatives from industry, consumers, landowners and other interest groups. A National Advisory Group was also established to provide advice and direction to the Government. The Directive has also moved away from relying entirely on point source pollution control to a combined approach where both point source control and ambient water quality control are implemented. The UK faces a similar challenge as

in Malaysia where land use planning (under a different process) and Basin planning has to be aligned and made complementary to each other. As the country gets more urbanised, there will be more diffused sources of pollution increasing pressure on river water quality. Climate change and its impact on IRBM (not to mention on almost all other aspects) is being paid attention in the EU. Greater attention is being paid in the UK to critical issues such as pollution arising from storm water drainage, urban drainage and sewage all of which has to be aligned in the context of appropriate land use planning. The EU's approach will also achieve greater success because sufficient funding is being made available to implement all the programs. Thailand's experience shows that even a unitary state will face problems in the making of laws and implementation of IWRM plans and that such implementation is a reiterative process that takes considerable time before tangible results are achieved. Brazil is a Federal State with a structure of governance which is almost similar to Malaysia and with similar issues and problems in management of water and biodiversity resources in a fast developing economy. Brazil has however managed to overcome complex issues of governance and adopt a holistic policy and law for better governance of its resources.

3.9.3 Lessons Learned

(i) Lessons from the five basins (and generally from international practices elsewhere) that is relevant to Malaysia may be summarised as follows:

a) water resources are seen as a limited resource with an economic value to the nation. The legislative framework therefore adopts an approach that seeks to regulate water resources as an economic asset to be managed in a holistic manner;

b) the common approach appears to be that water resources are regulated and controlled through the implementation of IRBM. However even though the approach is, for practical purposes, from a river basin perspective all water resources (rivers, lakes, wetlands, groundwater, estuaries) are often addressed and included within most integrated plans. The Global Water Partnership reports that many countries have made significant efforts to improve institutional and legal frameworks for water management. National water laws and policies adopted recently have generally taken into account good governance values and IWRM principles;[26]

c) legislation is a primary requirement for better governance though by itself laws do not guarantee effective governance. Enforcement and implementation of this legislation depends on many factors including a proper institutional structure, political will and stakeholder participation. The legislation often incorporate aspects of institutional structure, corporate governance and accountability;

26 pg 13, "A Handbook for Integrated Water Resources Management in Basins", Global Water Partnership 2009.

d) most legislative frameworks provide mechanisms for change such as a requirement that all IWRM/IRBM Plans are reviewed every 5-6 years. Legislation itself may change over time as character of governance changes. Thus the Murray Darling Committee became a Commission and is now an Authority. The EU modifies its approaches to the implementation of the Water Framework Directive as lessons are learnt. Brazil has evolved a more unified nationally driven agenda for IWRM;

e) there appears to be a progression of authority with the national government playing an increasingly important role in most issues and not just on those that transcend political/administrative boundaries. A national framework for IWRM is essential as shown in all the countries surveyed above including Brazil, South Africa and France. The national approach to IWRM should reflect and complement the State Basin Plans;

f) almost all the legislation appears to encompasses two broad areas namely those affecting water and land and those affecting inter-agency relationships and coordination. Environmental issues are another common concern;

g) the legislation also generally appears to cover aspects beyond water. They include access to and use of land, navigation, recreation, commercial fishing, property, drainage and flood mitigation and pollution control. Most also include community values such as traditional practices, heritage and geological values, religious and cultural values of water and streams, and ecological benefits and services;

h) there is strong emphasis on effective stakeholder participation and an inclusive approach is adopted with decisions made as close as possible to the location of water or where it is used; and

i) contemporary legislation is also concerned with allocative efficiency of limited water resources. The law seeks to regulate equitable distribution of water taking into account the economic services provided by water and its overall ecological values. The EU Directive for example integrates various disciplines (hydrology, hydraulics, ecology, chemistry, soil sciences, agronomy, forestry, technology, engineering and economics) to aid in its implementation. Thus the law often provides for not just regulation of the supply side of water resources but also demand management including pricing and provision of economic and financial instruments.

3.10 LEGISLATIVE FRAMEWORK FOR IWRM

3.10.1 Introduction

(i) As mentioned earlier in this Report, it may generally be stated that "water" is largely a State matter. However, the Federal Government has powers over specific matters such as federal works including water supplies, rivers and canals, hydropower

generation, navigation, marine fisheries and mining. The Federal Government may also make laws related to items listed in the Concurrent List and these include water supplies, Town and Country Planning, Drainage, Wildlife and Rehabilitation of Land with Soil Erosion. Of importance is Parliament's power to make laws with respect to any matter in the State List for the purpose of **promoting uniformity of laws** of two or more States and to implement international conventions and agreements. The power to make such laws, however, is subject to other conditions or restrictions imposed by the Constitution. Despite these restrictions, the Waters Act 1920 has remained on the list of statutes and in force in almost all states in the Peninsular for almost a century. This is illustrative of the requirement, even a century ago when there was but snail paced development, for a more consistent approach to be adopted in the management of water resources across the Peninsular. The Waters Act illustrates the need for a similar if not more contemporary legislation to be in place today in order to ensure the sustainable use and conservation of water resources to support the continued development of the nation.

(ii) On a positive note, a large number of States have proceeded to put in place state legislation to regulate and control water resources. However each one of them has adopted a different approach and variations which adds to the complexity of implementing IWRM on a consistent basis throughout the nation. Such disparate and different approaches to the management of water resources may well give rise to many issues as mentioned in various parts of this Report. The reality on the ground is that problem and issues related to water cannot solely be left to be handled individually by 14 different States. At the very least State Governments do require Federal support in capacity building and financing to ensure that their water resources are managed well and to face the challenges that will be posed increasingly by climate change.[27] That the support of the Federal Government is vital is shown in both the review undertaken on comparative practices internationally in countries like Brazil and Australia as well as the experiences of states such as Selangor and Sabah. It will not be possible for the Federal Government to provide such support to State Governments unless there is an appropriate national policy and institutional framework at the Federal level.

3.10.2 Legislative Considerations

(i) A detailed review has been undertaken in an earlier section of all relevant legislation in the country. It may be surmised here that there is currently no single Federal legislation that comprehensively covers IWRM. Existing Federal legislation does however enable regulation and control over particular aspects of water resources such as environmental pollution and water supply. Laws passed by Parliament for the purposes of uniformity empower State Authorities to regulate disparate aspects of water resources including rivers (Waters Act), town and country planning, forestry, wildlife and mining.

27 See article by NAHRIM, pg. 8, MyWp Newsletter, Issue No. 5, February 2010 on some effects of climate change in Malaysia.

(ii) It is apparent from the review of contemporary practices in international as well as local jurisdictions that legislation is a required tool for effective governance. Only four States (Pahang, Kedah, Sabah and Selangor) in Malaysia currently have enacted specific legislation for the management of water resources. Some of them conducted a detailed review of the management of water resources in their respective states before arriving at the conclusion that the preferred option would be the setting up of a water resources authority in the State. However they also came up with different models for the management of water resources including legislation, coverage of water resources and institutional structure for IWRM, which differ in scope, application and powers. At this point in time, only Sabah and Selangor are actively implementing their laws whilst Kedah has not commenced implementation. The lack of implementation or even ineffective implementation is not a basis for the adverse argument that such legislation is not necessary or misplaced.

3.10.3 Legislative Options

(i) Given the challenges and considerations above the following options were put forward and considered by all stakeholders:

a) Option 1: Enact a Federal Law

Pursuant to Article 76(3) of the Federal Constitution, Parliament may adopt a national law to ensure consistency of implementation of IWRM among all states. The national law may be similar in intent as the Waters Act 1920 but updated to enable implementation of IWRM. The States and Federal Government will continue to maintain their respective jurisdictions over water resources as enshrined in the Constitution. In order for the Law to come into effect in any State, it must be passed by the State legislature after which it shall be considered as State law. Each State may adopt all or part of the National Act depending on its needs and peculiarities. The law can be modeled on the Waters Act 1920 but updated and modified to take into account best practices in some States as well as other countries. The proposed national law could provide powers to both the Federal and State Governments consistent with the provisions of the Constitution. It could also formalize the establishment of the National Water Resources Council at the Federal level whose policy decisions may then act as guidance to all States. Those States, which have currently enacted State Laws on water resources management and are implementing them may, if necessary, review and amend the State enactments to be made consistent with the national law. The Act will enable the Federal Government to empower a national water resources Agency to ensure consistency of implementation, provide funding and engage in capacity building.

b) Option 2: Amend the Federal Constitution to bestow powers on the Federal Government

To enact a federal law that would empower a Federal Agency with full powers to implement IWRM throughout the country. Such a law will intrude into the existing powers of a State. This option can only be implemented if appropriate amendments to the Federal Constitution are made. Given the current scenario this option is not considered practical.

c) Option 3: Enact State Laws

This will be no different from the current situation where each State may make laws to address their peculiar and unique problems therein. The absence of a clear national policy on water resources and a uniform law will result in the adoption of different approaches, policies and enforcement structures. The Federal Government will not have a significant role in IWRM.

d) Option 4:Strengthen the Existing Legislative Regime

The fourth option would be to strengthen all relevant existing laws, whether Federal or State, seeking to incorporate elements of IWRM into these laws. The review of laws in this Study indicates that this would be a huge task as it will require numerous laws to be amended not only to strengthen each one of them but also to resolve conflicts and duplication. Such a task will still have to be consistent with current constitutional requirements and the problem of integration between the Federal and States laws will not be resolved.

(ii) All four options were thoroughly discussed and considered by all major stakeholders before Option 1 was agreed as the best approach to be adopted as the way forward.

3.10.4 Draft National Water Resources Law

(i) The legislation, based on Option 1 should be similar in nature to the Waters Act 1920 with the primary objective of establishing greater consistency in the sustainable development, use and conservation of water resources by all States. A detailed Framework of the proposed Draft National Water Resources Law (NWRL) was prepared and feedback obtained from all stakeholders. This Framework was also discussed in dialogues conducted with representatives at all the States and at a final Workshop held in Kuala Lumpur. A copy of the Final Framework is enclosed herewith as **Annex 3.5**. The Framework contains details of the proposed Draft NWRL.

(ii) The Framework set the following primary principles as the basis for the Draft NWRL:

a) The NWRL shall be consistent with the Federal Constitution. It must be in strict conformity with the jurisdictions of the Federal and State Governments' as enshrined in the Constitution under Articles 74, 78, 80, 81, 92, 93 and 94;

b) Pursuant to Article 76(1)(a) and (b) of the Federal Constitution, Parliament may adopt a law to ensure uniformity among all states;

c) For the NWRL (made under 76(1)(b)) to come into effect in any State (other than the Federal Territories), each State legislature will have to adopt this Act of Parliament – Article 76(3);

d) The NWRL shall review, update and expand the scope of the Waters Act 1920;

e) The NWRL shall take into account existing enactments in some States on water resources;

f) States with existing water resources enactments may continue to use them until they are ready to undertake a review of their laws to make it consistent with the NWRL;

g) The NWRL shall be consistent with and give effect to the proposed National Water Resources Policy and institutional set up in this Study;

h) The NWRL will leverage on existing State (eg. Land Conservation Act) and other Federal laws (eg. EQA) and avoid duplication or conflict with such laws.

(iii) Based on the Framework and the principles as agreed by all major stakeholders, a Draft of the NWRL has been prepared and is enclosed herewith as **Annex 3.6**. The Draft itself is self-explanatory and needs no elaboration in this Report. All the justification and rationale for the NWRL has been elucidated in various sections of the Report. It must be stated here that the Draft NWRL contained in this Report is but merely the first step in the finalization of an appropriate piece of legislation for the proper governance of water resources in the country. Drafting of any legislation is a tedious reiterative process which is best conducted in a continuous two way dialogue between the Drafters and the primary stakeholders and finally to the satisfaction of the Attorney Generals Department. The Draft NWRL in this Report has not gone through the latter process. It is hoped that with this Draft in hand, the reiterative process can commence to finally end up in a Parliamentary Bill for the National Water Resources Act.

Annex 3.1 - Federal, State and Concurrent Powers

ANNEX 3.1 - FEDERAL, STATE AND CONCURRENT POWERS

Table 1: Federal List

Item	Subject Matter	Remarks
1	External Affairs including: (a) Treaties, agreements and conventions with other countries and all matters which bring the Federation into relations with any other country; (b) implementation of treaties, agreements and conventions with other countries; (d) International organizations; participation in international bodies and implementation of decisions taken thereat;	Would have an impact on international transboundary rivers such as Sg Golok and Sg Limbang. Sale/transfer of water from/to other countries. Implementation of the obligations under the Rio Summit and subsequent UN Water resolutions would be Federal responsibility.
7	Finance including: (d) Loans to or borrowing by the States; (h) Taxes	States have limited sources of revenue. Water rates are one of them.
8	Trade, commerce and industry, including: (j) Subject to item 2c of State List: Development of mineral resources, mines, mining, minerals and mineral ores.	Traditionally mining activities have taken water out of rivers and discharged into them.
9	Shipping, navigation and fisheries, including: (a) shipping and navigation on the high seas and in tidal and inland waters; (b) ports and harbours; foreshores; (d) Maritime and estuarine fishing and fisheries, excluding turtles.	Shipping in rivers and lakes, especially by local boats is not included within Federal jurisdiction.
10	Communications and transport, including: (a) roads, bridges and ferries if declared to be federal or under federal law; (d) regulation of traffic by water other than on rivers outside harbour areas wholly within one state; (e) carriage of passengers and goods by water;	Regulation of traffic on rivers and lakes, outside harbour areas, are under State jurisdiction.
11	Federal Works and power including: (b) water supplies, rivers and canals except those wholly within one state or regulated by an agreement between the states concerned; Production, distribution and supply of water power;	Hydro power is wholly within Federal jurisdiction. Where inter-state rivers occur Federal Government may have jurisdiction over Federal works within such rivers;
12	Surveys, inquiries and research including: (b) social, economic and scientific surveys; (c) scientific and technical research.	Research may be coordinated by the Federal government.
13	Education including: (a) promotion of special studies and research, scientific and literary societies; (b) Libraries, museums, ancient and historical records.	Special studies and research into water resources and its management may be coordinated by the Federal Government.
16	Welfare of the aborigines.	Often these communities live in the catchments of rivers and water sources.
20	Control of agricultural pests and prevention of plant diseases.	Use of pesticides and the adoption of best practices in agricultural practices will impact water resources.
25A	Tourism	Impact of tourism in water catchments.

ANNEX 3.1 (cont'd)

Table 2 – State List

Item	Subject Matter	List IIA – Supplementary for Sabah/Sarawak	Remarks
2	Land including: (a) land tenure, colonization, land improvement and soil conservation. (c) permits and licences for prospecting for mines, mining leases and certificates; (d) compulsory acquisition of land; (e) transfer of land, leases and charges in respect of land; easements.		Matters pertaining to land are almost wholly (with the exception for Federal works) under State jurisdiction.
3	Agriculture and Forestry		
4	Local Government including: (a) local administration, municipal corporations; local, town and rural board and other local authorities; local government services. (b) obnoxious trades and public nuisances in local authority areas.		Local authorities have a critical role to play especially on issues related to drainage within urban areas, disposal of solid wastes and sewerage.
6	State Works and Water – (b) Roads, bridges and ferries other than those in the Federal List; (c) subject to the Federal List, water (including rivers and canals); control of silt; riparian rights		Water as an item is largely under the State List.
10	Inquiries for State purposes including collection of statistics with respect to any of the matters in the State List or dealt with by State Law.		Collection, collation and publication of data on water resources is an important activity.
12	Turtles and riverine fishing.		
12A	Libraries, museums, ancient and historical records except those declared to be Federal.		
14		Incorporation of authorities and other bodies set up by State Law if incorporated directly by State Law.	
15		Ports and harbours, other than those declared to be Federal by or under Federal Law; regulation of traffic by water in ports or rivers wholly within the State, except traffic in Federal ports or harbours; foreshores	
16		Cadastral land surveys.	

ANNEX 3.1cont'd)

Table 3 – Concurrent List

Item	Subject Matter	List IIIA – Supplementary for Sabah/Sarawak	Remarks
3	Protection of wild animals and wild birds; National Parks		Biodiversity is an important marker of the health of the ecosystems including water.
4	Animal husbandry, veterinary services, animal quarantine		Intensive farming of animals without adequate control over run off and discharge can lead to pollution of waters.
5	Town and Country Planning except in the Federal capital		Land use planning in accordance with the principles of IRBM and adherence to such planning will have a positive impact on the state of water resources.
7	Public health, sanitation		Inadequate sewerage services, standards and practices will impact water resources. Water borne diseases are a danger to public health.
8	Drainage and Irrigation		No specific laws have been made on drainage issues in urban areas.
9	Rehabilitation of mining land and land with soil erosion.		Implementation of the Land Conservation Act has been negligible.
9D	Water supplies and services		Federal laws have been enacted and the National Water Services Commission set up.
12		Shipping under 15 registered tons including the carriage of passengers and goods by such shipping; maritime and estuarine fishing and fisheries;	
13		The production, distribution and supply of water power and electricity generated by such water power;	
14		Agricultural and forestry research; control and protection of agricultural pests; prevention of plant diseases.	

Annex 3.2 – Summarised Review of Federal Legislation

SUMMARISED REVIEW OF FEDERAL LEGISLATION

(A summary of the review is given below, with the detailed separately in a CD attached in this Report)

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2. Bintulu Port Authority Act 1981	3
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6. East Coast Economic Region Development Council Act 2008	4
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21. Land Acquisition Act 1960	10
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25. Lembaga Kemajuan Johor Tenggara (Dissolution) Act 1997	12
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48. Penang Port Commission Act 1955 20
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51. Perbadanan Putrajaya Act 1995 21
52. Petroleum Development Act 1974 22
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61. Town and Country Planning Act 1976 25
62. Water Services Industry Act 2006 26
63. Water Supply (Federal Territory of Kuala Lumpur) Act 1998 26

1. ABATTOIRS (PRIVATIZATION) ACT 1993

An Act to facilitate privatization of abattoirs and for matters connected therewith. Abattoir is defined under the Act as any place, with proper meat inspection facilities, for the slaughter of animals namely oxen/buffalo, goat/sheep, pig/sow. According to the present Act, licence can be revoked when conditions are not complied with and has affected or likely to affect public interest or safety and the licensed operator has refused to take or has not taken all necessary steps stated by the Minister to ensure compliance.

Furthermore, rules may be made as to provide for the safe use and cleanliness of abattoirs and premises under the control of a licensed operator. A general penalty is also imposed on the licensed operator who fails to comply with any of the conditions of the licence.

2. BINTULU PORT AUTHORITY ACT 1981

This is an Act to provide for the establishment of the Bintulu Port Authority, to manage the development, control and administration of Bintulu Port and for all other matters connected therewith. Pursuant to this Act, the Authority shall have power to, utilize all necessary and convenient drains, culverts, roads, within the limits of the area vested in the Authority and to supply water to shipping in the Port.

Additionally, the Authority may levy charges in respect of services, works or facilities rendered, performed or provided in the exercise of its functions under this Act and for that purpose it shall with the approval of the Minister from time to time prescribe charges or scales of charges and impose penalties or interests for late payment of any dues in respect of, inter alia, water supplied by the Authority.

Apart from that, the Authority may with the approval of the Minister make by-laws for inter alia, keeping clean the basins, works and premises of the Authority and the waters adjacent thereto, and preventing oil, filth and rubbish from being thrown or from entering therein or thereon.

3. BIOSAFETY ACT 2007

An Act to establish the National Biosafety Board ("Board") to regulate, inter-alia, importation and exportation of living modified organisms in sea waters and the release of products of such organisms, with the objectives of protecting human, plant and animal health, the environment and biological diversity which includes the marine and aquatic ecosystems.

Amongst the functions of the Board is to assess reports on the effect such living modified organisms and products of such organisms will have or are likely to have on the human, plant and animal health, the environment and biological diversity and the proposed measures that shall be undertaken to prevent, reduce or control the risks and adverse effect.

4. CONTROL OF ACTIVITIES ON THE LAKE (FEDERAL TERRITORIES OF PUTRAJAYA) BY-LAWS 2004

According to this Act, the Perbadanan shall be responsible for the management and conservation of the Lake including regulating and controlling all activities and works on the Lake.

This Act also provides for the control of use and flow of water and the Perbadanan shall exercise supervision and control over the use and flow of water in or to the Lake. It is to be noted that no person shall disrupt or obstruct or cause or permit the natural flow of water in or to the Lake to be disrupted or obstructed or take or use any water from the Lake.

In addition, the Perbadanan may declare specified areas on the Lake as designated zones for the purpose of ensuring public order, safety and health, to protect the Lake from damage, prevent any nuisance, preservation of flora and fauna and for the carrying out of any activities approved by the Perbadanan.

Furthermore, report of accidents is to be lodged immediately in the event of pollution and not later than 4 hours of the occurrence of any other incident. Not only that, to protect the water, the Perbadanan may issue a water protection order in respect of the Lake, if satisfied that there is a serious threat or risk to health of the public caused or contributed to by an immediate threat to the quantity or quality of the water or an immediate threat or risk of pollution

5. DRAINAGE WORKS ACT 1954

An Act to regulate drainage works in West Malaysia, drainage works including the construction and maintenance of drains and watercourses, embankments, culverts, sluices, water gates, access paths in drainage reserves and other similar works.

According to this Act, the Ruler In Council may gazette any land effected by any drainage works sanctioned or carried out, wholly or in part, by the Government of Malaysia or of any State to be a drainage area. The Drainage and Irrigation Engineer (who is the officer in charge of any drainage area) shall have the power to license sampans and small craft using the drains, canals or water ways within the drainage area.

The Act also provides that no person shall construct any canal, watercourse, drain, ditch or pond within any drainage area so as to connect with any drainage works unless he had previously obtained permission in writing for such construction from the officer in charge of such area.

6. EAST COAST ECONOMIC REGION DEVELOPMENT COUNCIL ACT 2008

This is an Act to incorporate the East Coast Economic Region Development Council, to regulate and manage the developments within the East Coast Economic Region and to provide for coordination between Government entities in the promotion of trade, investment, tourism and development activities within the East Coast Economic Region.

The Council shall draft a draft East Coast Economic Region Master Plan, which shall include, inter alia, for the management and conservation of natural environmental resources, agricultural resources, sensitive coastal ecosystems, highlands, forests, parks and open spaces in the East Coast Economic Region inclusive of the improvement of water, energy and waste management.

7. ELECTRICITY SUPPLY ACT 1990

An Act to provide for the regulation of the electricity supply industry inclusive of pricing and the licensing of any electrical installation,

Pursuant to the Act, precautions are set out for electricity related works which may affect, inter alia, river, canal or other waterway or any system of irrigation, drainage or water supply.

Additionally, the State Authority in any State, may declare any lake, river or waterway or any part thereof to be a source of water for the purposes of the licensee as stipulated in the terms and conditions of his licence and may impose such conditions and restrictions as it deems fit.

With a valid licence, no person shall dam up or otherwise interfere with any such source of water without first serving on the licensee either personally or by registered post a three months' notice, in such form as may be prescribed, specifying the work he proposes to undertake.

8. ENERGY COMMISSION ACT 2001

An Act that provides for the establishment of the Energy Commission with powers to regulate the energy supply activities in Malaysia and to enforce the energy supply laws and for matter connected therewith.

The provisions of the Act lays down on the interpretation of renewable energy which includes energy obtained from energy sources such as biomass, hydro power, solar power, geothermal power, wind power, waves and tides. Furthermore, the Act mentions on the functions and powers of Commission which is to regulate matters concerning electric supply industry and to protect any person from dangers arising from the production or the use of electric supply

9. ENVIRONMENTAL QUALITY (SCHEDULED WASTES) REGULATIONS 2005

According to the Act, Scheduled Wastes must be stored in containers to prevent spillage or leakage of the scheduled wastes into the environment and the areas for the storage of the containers shall be designed, constructed and maintained in accordance with the guidelines prescribed by the Director General.

In addition, the contractor must avoid densely populated areas, water catchment areas and other environmentally sensitive areas in transporting the scheduled wastes. In the event that

there is a spill or accidental discharge on the environment over a period, the contractor shall undertake studies to determine the impact thereof.

10. ENVIRONMNETAL QUALITY ACT 1974

This is an Act relating to the prevention, abatement, control of pollution and enhancement of the environment and for purposes connected therewith.

The Act provides that no person shall, unless licensed, emit, discharge, or deposit any environmentally hazardous substances, pollutants or wastes into any inland waters in contravention of the acceptable conditions specified in the Act.

Water supply, namely construction of dams or impounding reservoirs with a surface area of 200 hectares or more and groundwater development for industrial, agricultural or urban water supply of greater than 4,500 cubic metres per day, is a prescribed activity under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987 and is therefore regulated by the Environmental Quality Act. Persons intending to carry out such activities are required to submit an environmental assessment report for the approval of the Department of Environment.

11. FACTORIES AND MACHINERY ACT 1967

This is an Act to provide for the control of factories with respect to matters relating to the safety, health and welfare of persons therein, the registration and inspection of machinery and for matters connected therewith.

Pursuant to the Act, without prejudice to any law relating to public health, every factory shall be kept in a clean state and free from offensive effluvia arising from any drain, sanitary convenience or other source and shall be cleaned at such times and by such methods as may be prescribed and these methods may include lime-washing or colour washing, painting, varnishing, disinfecting or deodorizing.

12. FEDERAL AGRICULTURAL MARKETING AUTHORITY ACT 1965

An Act to incorporate the Federal Agricultural Marketing Authority to supervise and regulate the marketing of agricultural produce in Malaysia, including the importing and exporting of agricultural produce.

Pursuant to this Act, the Authority shall have power in particular to acquire, purchase, establish, construct, equip, maintain, let, lease, control, manage or operate a warehouse for the storage and inspection of any agricultural produce in any public quay, wharf or street, adjacent to any airport or sea port or any waterway connected to that sea port.

13. FEDERAL CONSTITUTION

The Federal Constitution provides the Constitution for Malaysia.

In exercising the legislative powers conferred on it by this Constitution, Parliament may make laws for the whole or any part of the Federation and laws having effect outside as well as within the Federation and the Legislature of a State may make laws for the whole or any part of that State.

According to the Constitution, without prejudice to any power to make laws conferred on it by any other Article, Parliament may make laws with respect to any of the matters enumerated in the Federal List or the Concurrent List.

Additionally, if any State law is inconsistent with a federal law, the federal law shall prevail and the State law shall, to the extent of the inconsistency, be void.

Note also that Parliament have powers to legislate for States in certain cases. Additionally, where it appears to the presiding officer of either House of Parliament or of the Legislative Assembly of any State that a Bill or an amendment to a Bill proposes a change in the law relating to any of the matters enumerated in the Concurrent List, or to any of the matters enumerated in the State List with respect to which the Federation is exercising functions in accordance with Article 94, he shall certify the Bill or amendment for the purposes of this Article.

14. FEDERAL LANDS COMMISSIONER ACT 1957

This is an Act relating to the establishment and incorporation of a Federal Lands Commissioner and for matters connected therewith.

According to this Act, the Yang di-Pertuan Agong may appoint, from time to time, a public officer to be the Federal Lands Commissioner.

Note that according to this Act, all immovable property which, immediately before the commencement of this Act was vested in the Chief Secretary for the purposes of the Federal Government or for the purposes of the Government of any State or Settlement or for the purposes of the Malayan Railway including property vested in the Chief Secretary, Federation of Malaya, under section 7 of the *Chief Secretary (Incorporation) Ordinance 1949, shall, on the coming into force of this Act and without any conveyance, assignment or transfer whatever, vest in the Corporation for the like title, estate or interest and on the like tenure and for the like purposes as the same was vested or held immediately before the coming into force of this Act.

15. FEDERAL TERRITORY (PLANNING) ACT 1982

This is an Act to make provisions for the control and regulating of proper planning in the Federal Territory and for purposes connected therewith or ancillary thereto.

Notwithstanding the general rule, no planning permission shall be necessary for carrying out such works necessary for the maintenance, improvement or other alteration of any building which affect only the interior of the building and which do not involve any addition to or alteration of a building which affects or is likely to affect its drainage, sanitary arrangements or its soundness. No planning permission shall also be necessary for the carrying out by the federal or the state government or the city or any authority established by law to provide amenities of any works for the purpose of laying, inspecting, repairing or renewing any drains, sewers, mains, pipes, cables or other apparatus including the breaking open of any road or other land for that purpose.

16. FISHERIES ACT 1985

This is an Act relating to fisheries, including the conservation, management, and development of maritime and estuarine fishing and fisheries.

The objective of this Act is to provide better conservation, management and development of fisheries in Malaysia. According to this statute, the State is, inter alia, empowered to make rules to:

to promote and regulate aquaculture in riverine waters and, in particular, provide for the leasing and licensing of lakes, swamps, mining pools and other pools and land and other areas for the cultivation of fish, prescribe standards for the construction and operation of aquaculture establishments (including the size and depth of ponds), measure for the prevention of fish and diseases and controls over particular species of fish which may be produced by cultivation.

To provide for the licensing of fishing vessels and fishing appliances operating or in use in riverine waters; and

Regulate and control the construction of dams or other obstruction to the natural environment or habitat of fish.

The Act also provides that any person who undertakes any fishing activity, operates or allows to be operated, in Malaysia fishing waters and local fishing vessel for the purpose of fishing without a valid licence issued in respect of such vessel or in contravention of any direction in writing issued by the Director General under the same Act shall be guilty of an offence.

17. GEOLOGICAL SURVEY ACT 1974

This is an Act that regulates and controls geological surveys, to establish geological archives and to provide for matters incidental thereto. The present Act provides for the power of a Geological Survey and it includes to bore, drill, fracture, dig or pit over the land and also to obtain and remove any specimen or sample from the land in furtherance of such survey and remove and dispose of as he deems fit such superficial or cognate material as may be necessary to obtain the specimen or sample.

Further, if there is any person who bores, drills, digs or otherwise develops a well for the purpose of searching for or extracting water therefrom shall notify the Director General of such details and it does not include a well which is less than 30 feet in depth without reaching bedrock or yield less than 500 gallons of water per day and is used only for the domestic purposes of the household of the person responsible for its development.

18. IRRIGATION AREAS ACT 1953

This is an Act relating to the establishment and regulation of irrigation areas in Malaysia. As defined under the Act, "irrigation" means the practice of causing water to flow upon, or spread over, or under, the surface of land or of retaining water on or under the surface of land for agricultural purpose and includes drainage for the removal of water which is injurious to agriculture.

Pursuant to the provisions of this Act, the Ruler in Council or the Yang Di-Pertua Negeri in Council may by notification to the *Gazette* declare, amongst others, any lands in a State within the area affected by any irrigation works to be an irrigation area, specify the nature of cultivation in such lands and impose annual (water) rates on any land within an irrigation area.

The Act also provides that every irrigation area and irrigation works shall be in the charge of a Drainage and Irrigation Engineer who may, if it appears to him that it will be of benefit to the irrigation works in his charge so to to, fill up, construct, widen or drain any canal, water-course, drain, ditch, pond or swamp whether within or without an irrigation area provided that he shall pay to the owner or occupier, if any, reasonable compensation for any damage, loss or inconvenience arising and if the parties fail to agree as to the amount so payable the question shall be referred to the appropriate authority whose decision will be final.

Offences prescribed under the Act include:

(a) obstruction and causing damage to irrigation works;

(b) wasting water conserved in any irrigation works or unlawfully draws or use conserved water;

(c) construction of any canal, watercourse, drain, ditch or pond or deepens or enlarges existing canal, watercourse, drain, ditch or pond within any irrigation area without having previously obtained the consent thereto in writing of the Drainage and Irrigation Engineer or other officer-in-charge of such area;

(d) unauthorized use of vehicles or boats in irrigation canals or watercourse; pollution of irrigation tank, channel or water course; and tampering with irrigation works.

19. ISKANDAR REGIONAL DEVELOPMENT AUTHORITY ACT 2007

This is an Act to incorporate the Iskandar Regional Development Authority in which to manage the development within the Iskandar Development Region and to provide for co-ordination between government agencies to promote trade, investment and development within the Iskandar Development Region, and to provide for matters connected therewith or ancillary thereto.

Pursuant to this Act, a draft comprehensive development plan shall consist of proposals for, inter alia, the development of coastal areas in the Iskandar Development Region in balance with the protection of the natural coastal environment.

20. KEMUBU AGRICULTURAL DEVELOPMENT AUTHORITY ACT 1972

This is an Act to incorporate the Kemubu Agricultural Development Authority and to provide for matters connected therewith.

The functions of the Authority among other, are to plan and undertake within the Kawasan Kemubu such agricultural development as may be assigned to it by the State.

Note that the Authority shall be responsible to the Minister, and the Minister may from time to time, give directions not inconsistent with the provisions of this Act and the Authority shall, as soon as possible, give effect to all such directions.

For the purpose of this Act, the Minister may, after consulting with the Government of State, from time to time, determine by notification in the *Gazette* the area within which the Authority shall perform its function under this Act and such area shall be known as the "Kawasan Kemubu".

For the purpose of compulsory acquisition of land, when any immovable property, not being State land, is needed to be acquired by the Authority for the purpose of this Act, such property may be acquired in accordance with the provisions of any written law relating to the acquisition of land for a public purpose for the time being in force in the State, and any declaration required by any such written law that such land is so needed may be notwithstanding that the compensation is to be paid by the Authority; and such declaration shall have effect as if it were declaration that such land is needed for a public purpose in accordance with such written law.

21. LAND ACQUISITION ACT 1960

This Act governs compulsory acquisition of land by the government and the assessment of compensation to be made on account of such acquisition.

Pursuant to this Act, the State Authority has the mandate to apply for the acquisition of such land for public purposes, if its beneficial to the economic development of Malaysia or for, inter alia, agricultural and residential purposes. The Act also empowers the State Authority to

urgently acquire lands for, inter alia, public utility which includes water supply, sewerage and drainage system and only other similar public service or convenience.

Compensation as such must be given to persons interested in such lands. And in making any assessment of compensation where land is acquired to carry out public works, increase in the value of the land or advantages thereof which will accrue to any person interested therein must be taken into account.

22. LAND CONSERVATION ACT 1960

The present Act is an Act relating to the conservation of hill land and the protection of soil from erosion and the inroad of silt.

According to the Act, if it appears desirable to the Ruler in Council or the Yang di-Pertua Negeri in Council, to acquire any hill land for the purpose of preventing soil erosion it shall be lawful for the Ruler in Council or the Yang di-Pertua Negeri in Council to direct that such hill land be acquired either by private treaty or under the Land Acquisition Act 1960 and for the purpose of that Act the land to be acquired shall be deemed to be required for a public purpose.

However, whenever it appears to a Land Administrator on grounds that earth, mud, silt, gravel or stone from such land has caused or is likely to cause damage to other land, whether alienated or not, or to any watercourse, whether natural or artificial, the Land Administrator may by notice served on the owner or occupier of such land require him to show cause, at a time and place to be stated in such notice, why an order should not be made under this Act.

Furthermore, where any drain, watercourse, dam, wall or other work has in pursuance of an order under section 14 been made on any land, all persons who are from time to time registered as owners or occupiers of such land shall, so long as such order remains unrevoked, at his or their own expense maintain such work in good and efficient order to the satisfaction of the Land Administrator.

23. LAND DEVELOPMENT ACT 1956

This is an Act to provide for the establishment of a Federal development authority and local development boards to promote and carry out projects for land development and for purposes connected therewith.

Under this Act, Federal Land Development Authority has the duty to, inter alia, undertake and carry out such activities as may assist in the modernization of agricultural sectors particularly those relating to production and processing of crops, livestock and freshwater fisheries.

In the performance of its duties, the Authority also has the mandate to compulsorily acquire any immoveable property not being State or Federal Land except for immoveable property in the State of Sabah and Sarawak which requires first the concurrence of the Yang Dipertua Negeri of Sabah or Sarawak.

24. LANGKAWI INTERNATIONAL YACHT REGISTRY ACT 2003

This is an Act to provide for the establishment of an international registry in Langkawi for yachts and yachting entities, including its administration and operation, and for matters connected with it.

This Act provides that the Ministry of Transport may make such regulations, inter alia, for the protection of the marine environment from pollutions pertaining to the yachts and the marina.

25. LEMBAGA KEMAJUAN JOHOR TENGGARA (DISSOLUTION) ACT 1997

This is an Act to repeal the Lembaga Kemajuan Johor Tenggara Act 1972, to dissolve the Lembaga Kemajuan Johor Tenggara established under the Act, to transfer all its properties to the Government and to provide for other matters connected therewith.

According to this Act, all powers, rights, privileges, duties, liabilities and obligations which immediately before the appointed date were those of the Lembaga shall, as from that date, devolve on the Government.

Note that all lands which immediately before the appointed date were vested in the Lembaga shall, on the appointed date, vest in the Federal Lands Commissioner for the purposes of the Government. Additionally, all properties and assets other than land which immediately before the appointed date were vested in the Lembaga or in any person on its behalf shall, on that date, vest in the Government.

26. LEMBAGA KEMAJUAN KELANTAN SELATAN ACT 1978

An Act to incorporate the Lembaga Kemajuan Kelantan Selatan in which the Lembaga has the power to compulsorily acquire land for a public purpose and to promote, stimulate, facilitate and undertake residential, agricultural, industrial and commercial development in the Kawasan Kelantan Selatan.

27. LEMBAGA KEMAJUAN PAHANG TENGGARA (DISSOLUTION) ACT 1997

This is an Act to repeal the Lembaga Kemajuan Pahang Tenggara Act 1972, to dissolve the Lembaga Kemajuan Pahang Tenggara established under the Act, to transfer all its properties to the Government and to provide for other matters connected therewith.

According to this Act, all powers, rights, privileges, duties, liabilities and obligations which immediately before the appointed date were those of the Lembaga shall, as from that date, devolve on the Government.

Note that all lands which immediately before the appointed date were vested in the Lembaga shall, on the appointed date, vest in the Federal Lands Commissioner for the purposes of the Government. Additionally, all properties and assets other than land which immediately before

the appointed date were vested in the Lembaga or in any person on its behalf shall, on that date, vest in the Government.

28. LEMBAGA KEMAJUAN TERENGGANU TENGAH ACT 1973

This is an Act to incorporate the Lembaga Kemajuan Terengganu Tengah and to provide for matters connected therewith.

The functions of the Lembaga includes, inter alia, to promote, stimulate, facilitate and undertake residential, agricultural, industrial and commercial development in the Kawasan Terengganu Tengah and to control and co-ordinate the performance of the aforesaid activities in the Kawasan Terengganu Tengah.

Note that the Lembaga shall be responsible to the Minister, and the Minister may, from time to time, give directions not inconsistent with the provisions of this Act and the Lembaga shall, as soon as possible, give effect to all such directions.

For the purposes of this Act, the Minister may, with the concurrence of the Government of the State, from time to time, determine by notification in the *Gazette* the area or areas within which the Lembaga shall perform its functions under this Act and such area shall be known as the "Kawasan Terengganu Tengah".

For the purposes of compulsory acquisition of land, when any immovable property, not being State land, is needed to be acquired by the Lembaga for the purposes of this Act, such property may be acquired in accordance with the provisions of any written law relating to the acquisition of land for a public purpose for the time being in force in the State, and any declaration required by any such written law that such land is so needed may be made notwithstanding that compensation is to be paid by the Lembaga; and such declaration shall have effect as if it were a declaration that such land is needed for a public purpose in accordance with such written law.

29. LEMBAGA KEMAJUAN WILAYAH KEDAH ACT 1981

This is an Act to incorporate the Lembaga Kemajuan Wilayah Kedah and to provide for matters connected therewith.

The functions of the Lembaga include to promote, stimulate, facilitate and undertake residential, agricultural, industrial and commercial development in the Kawasan Lembaga Kemajuan Wilayah Kedah.

According to this Act, the Lembaga shall be responsible to the Minister, and the Minister may from time to time give directions not inconsistent with the provisions of this Act and the Lembaga shall, as soon as possible, give effect to all such directions.

For the purposes of this Act, the Minister may, with the concurrence of the Government of the State, from time to time determine by notification in the *Gazette* the area or areas within

which the Lembaga shall perform its functions under this Act and such area or areas shall be known as the "Kawasan Lembaga Kemajuan Wilayah Kedah".

For the purposes of compulsory acquisition of land, when any immovable property, not being State land, is needed to be acquired by the Lembaga for the purposes of this Act, such property may be acquired in accordance with the provisions of any written law relating to the acquisition of land for a public purpose for the time being in force in the State, and any declaration required by any such written law that such land is so needed may be made notwithstanding that compensation is to be paid by the Lembaga, and such declaration shall have effect as if it were a declaration that such land is needed for a public purpose in accordance with such written law.

30. LEMBAGA KEMAJUAN WILAYAH PULAU PINANG ACT 1983

This is an Act to incorporate the Lembaga Kemajuan Wilayah Pulau Pinang and to provide for matters connected therewith.

The functions of the Lembaga, inter alia, are to promote, stimulate, facilitate and undertake economic and social development in the Kawasan Lembaga Kemajuan Wilayah Pulau Pinang and to promote, stimulate, facilitate and undertake residential, agricultural, industrial and commercial development in the Kawasan Lembaga Kemajuan Wilayah Pulau Pinang.

Note that the Lembaga shall be responsible to the Minister, and the Minister may from time to time give directions not inconsistent with the provisions of this Act and the Lembaga shall, as soon as possible, give effect to all such directions.

For the purposes of this Act, the Minister may, with the concurrence of the Government of the State, from time to time determine by notification in the *Gazette*, the area or areas within which the Lembaga shall perform its functions under this Act and such area or areas shall be known as the "Kawasan Lembaga Kemajuan Wilayah Pulau Pinang".

For the purposes of compulsory acquisition of land, when any immovable property, not being State land, is needed to be acquired by the Lembaga for the purposes of this Act, such property may be acquired in accordance with the provisions of any written law relating to the acquisition of land for a public purpose for the time being in force in the State, and any declaration required by any such written law that such land is so needed may be made notwithstanding that compensation is to be paid by the Lembaga, and such declaration shall have effect as if it were a declaration that such land is needed for a public purpose in accordance with such written law.

31. LEMBAGA LETRIK SABAH ACT 1983

An Act to provide for the establishment Lembaga Letrik Sabah ("**Board**") to exercise functions relating to the supply of electricity and certain other matters and for purposes connected therewith.

According to this Act, no street, bridge, sewer, drain or tunnel is to be opened or broken up except after seven days' notice to and under the superintendence of the persons having the control or management thereof or of their officer.

In addition, the Act provides that even though any shore, bed of a lake, river, channel, creek, bay or estuary is included in the area of supply, nothing shall authorize the Board to take, use or in any manner interfere with any portion of that shore or bed of a lake, or of a river, channel, creek, bay or estuary or any right in respect thereof, or of the water thereof, without the previous consent in writing of the State Authority.

32. LEMBAGA PEMBANGUNAN LANGKAWI ACT 1990

This is an Act to incorporate the Lembaga Pembangunan Langkawi and to provide for matters connected therewith.

The functions of the Lembaga are, inter alia, to promote, stimulate, facilitate and undertake the development of tourism and infrastructure as well as residential, agricultural, industrial and commercial development in the Kawasan Lembaga Pembangunan Langkawi.

Note that the Lembaga shall be responsible to the Minister, and the Minister may from time to time give directions not inconsistent with the provisions of this Act and the Lembaga shall, as soon as possible, give effect to all such directions.

For the purposes of this Act, the Minister may, with the concurrence of the State Government, from time to time determine by notification in the *Gazette* the area or areas within which the Lembaga shall perform its functions under this Act and such area or areas shall be known as the "Kawasan Lembaga Pembangunan Langkawi".

For the purposes of compulsory acquisition of land, when any immovable property, not being State land, is needed to be acquired by the Lembaga for the purposes of this Act, such property may be acquired in accordance with the provisions of any written law for the time being in force in the State relating to the acquisition of land for a public purpose, and any declaration required by any such written law that such land is so needed may be made notwithstanding that compensation is to be paid by the Lembaga, and such declaration shall have effect as if it were a declaration that such land is needed for a public purpose in accordance with such written law.

33. LOCAL GOVERNMENT ACT 1976

An Act to revise and consolidate the laws relating to local government which includes the power of local authority to divert, inter alia, any strem and water course as well as powers to control pollution.

The Act, inter alia. Provides that it shall be an offence for any person to deposit any filth in or upon the bank of any stream, channel, public drain or other watercourse within the local authority area.

It is also offence for any person, whether within or without the limits of a local authority area, to:

(a) put or cause to be put or to fall or to flow or knowingly permits to be put or to fall or to flow or to be carried into any stream, so as either singly or in combination with other acts of the same or any other person to interfere with its due flow or to pollute its waters, the solid or liquid refuse of any manufactory, manufacturing process or quarry or any rubbish or cinders or any other waste or any putrid matter;

(b) cause to fall or flow or knowingly permits to fall or flow or to be carried into any stream any solid or liquid sewage matter; or

(c) use, for the purpose of carrying on any laundry trade, any stream, channel, public drain or other watercourse or pool, pond or tank.

34. MALAYSIAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE ACT 1969

This is an Act to establish the Malaysian Agricultural Research and Development Institute ("**MARDI**") with authority to undertake research and to liase with other lines of research concerning the agricultural industry, agro-based industry and food industry.

35. MALAYSIAN FORESTRY RESEARCH AND DEVELOPMENT BOARD ACT 1985

This is an Act to establish the Malaysian Forestry Research and Development Board, for the administration of a fund for the purpose of financing research and to provide for matters connected therewith.

The functions of the Board, are, inter alia, to conduct and promote research into forest development including the production, extraction, processing, storage, transportation and utilization of forest produce, and other fields appropriate to the continued development of the forestry sector and the conservation of the resource base and to secure, where the public interest or the interest of forest development and forest industries so require, the development and exploitation of results of research, which appear to the Board not to have been developed or exploited or sufficiently developed or exploited.

Note that the Board shall be responsible to the Minister and the Minister may, after consultation with the Board where in his discretion he deems it necessary to do so, give to it such directions as to him appear appropriate and expedient and the Board shall comply with such directions.

36. MALAYSIAN MARITIME ENFORCEMENT AGENCY ACT 2004

This is an Act to establish the Malaysian Maritime Enforcement Agency to perform enforcement functions for ensuring the safety and security of the Malaysian Maritime Zone with a view to the protection of maritime and other national interests in such zone and for matters necessary thereto or connected therewith

37. MALAYSIAN RUBBER BOARD (INCORPORATION) ACT 1996

This is an to repeal the Malaysian Rubber Research and Development Fund Act 1958, the Rubber Research Institute of Malaysia Act 1966, the Malaysian Rubber Exchange and Licensing Board Act 1972, the Rubber Shipping and Packing Control Act 1949 and the Rubber Export Registration Act 1966; to dissolve the Malaysian Rubber Research and Development Board, the Rubber Research Institute of Malaysia and the Board of the Rubber Research Institute of Malaysia and the Malaysian Rubber Exchange and Licensing Board; to establish the Malaysian Rubber Board and to provide for matters connected therewith and to make better provision in respect of the rubber industry of Malaysia.

Among others, the objective of the Board, is to promote and develop the rubber industry of Malaysia. The functions and powers include, inter alia, to develop, transfer, exploit and promote research findings and to provide technical, advisory and consultancy services to the rubber industry.

Note that all lands that before the appointed day were vested in, or reserved under any written law relating to land for the purposes of, the dissolved Boards and the dissolved Institute shall on that day vest in or be deemed to be reserved for the purposes of the Board. Additionally, all property and assets other than land that before the appointed day were vested in the dissolved Boards and in the dissolved Institute or in any person on behalf of the dissolved Boards or dissolved Institute, as the case may be, shall on that day vest in the Board.

38. MERCHANT SHIPPING (OIL POLLUTION) ACT 1994

This is an Act that imposes the civil liability of ship owners for oil pollution by merchant ships in any area of Malaysia and for matters connected therewith.

Under the Act, the ship owner shall be directly liable for such pollution and any provisions relating to the limitation of liability of the owner in certain cases or loss or damage under any other written law relating to merchant shipping shall not apply to that particular liability except as expressly provided by the Act.

39. MINERAL DEVELOPMENT ACT 1994

The Act provides the framework pertaining to powers of the Federal Government with regard to the inspection and regulation of mineral exploration and mining operations and other related issues. It regulates, inter alia, mining activities.

These include the statutory requirements that have t be observed by the mine operator before, during and after the commencement of mining operations, such as the giving of notice of intention to carry out exploration work, submission of the appropriate mining schemes to the relevant authority for approval before commencement of operations, notice of intention to commence mining operations and the carrying our of all related activities in accordance with good and safe practices and such environmental standards as may be prescribed under the Federal Any and nay written law relating to the environment. (In this case, the other written

law that is applicable is the Environmental Quality Act 1974, under which mining and quarrying are listed as prescribed activities that are subject to Environmental Impact Assessment.)

40. MUDA AGRICULTURAL DEVELOPMENT AUTHORITY ACT 1972

This is an Act to incorporate the Muda Agricultural Development Authority and to provide for matters connected therewith.

The functions and powers include, inter alia, to plan and undertake within the Kawasan Muda such agricultural development as may be assigned to it by the State Authority of the State of Kedah and Perlis.

According to this Act, the Authority shall be responsible to the Minster, and the Minister may, from time to time, give directions not inconsistent with the provisions of this Act and the Authority shall, as soon as possible, give effect to all such directions.

For the purpose of this Act, the Minister may, after consultation with the Government of the States of Kedah and Perlis, from time to time, determine by notification in the Gazette the area or areas within which the Authority shall perm its functions under this Act and such area or areas shall be known as the "Kawasan Muda".

For the purposes of compulsory acquisition of land, when any immovable property, not being Sate land, is needed to be acquired by the Authority for the purpose of this Act, such property may be acquired in accordance with the provisions of any written law relating to the acquisition of land for a public purpose for the time being in force in the Sate in which such property is situated, and any declaration required by any such written law that such land is so needed may be made notwithstanding that compensation is to be paid by the Authority; and such declaration shall have effect as if it were a declaration that such land is needed for a public purpose in accordance with such written law.

41. NATIONAL FORESTRY ACT 1984

An Act to provide for the administration, management and conservation of forests and forestry development within the States of Malaysia and for connected purposes.

The Director (State Director), with the approval of the State Authority, shall by notification in the *Gazette,* classify every permanent reserved forest under certain classifications including water catchment forest.

No person shall take any forest produce from a permanent reserved forest of a State land except:

under the authority of a licence, minor licence or use permit; or in accordance with any other written law.

42. NATIONAL HERITAGE ACT 2005

This is an Act that provides for the conservation and preservation of natural heritage including underwater cultural heritage and for other related matters.

The Commissioner, under this Act has the authority to ensure proper management of a heritage site including the use and development of all buildings and lands and the preservation of its surrounding environment. The Minister with advise from the Commissioner may also declare any underwater cultural heritage area to be a protected zone and no activity can be carried out by any person except with the approval in writing from the Commissioner. Any contravention of this by any person constitutes an offence under the Act.

43. NATIONAL LAND CODE

An act to amend and consolidate the laws relating to land and land tenure, the registration of title to land and of dealings therewith and the collection of revenue therefrom within the States of Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Pahang, Pulau Pinang, Perak, Perlis, Selangor, Terengganu and the Federal Territory of Kuala Lumpur.

Pursuant to this Act, the powers of disposal is veste din the State Authority and all property found therein is the property of the State Authority and the State Authority has the additioanl power to alienate, reserve, permit the occupation of State land. Additionally, the State Authority also has hte power to permit the extraction and removal of rock material from any land.

44. NATIONAL LAND CODE (PENANG AND MALACCA TITLES) ACT 1963

This is an Act to provide for the introduction of a system of registration of title to land in the States of Pulau Pinang and Melaka, for the issue of replacement titles, for the assimilation of such system to the National Land Code, and for matters incidental thereto.

The Act describes the boundaries of the seashore and riverine holdings. Additionally, a riparian proprietor may as of right and without payment of any fee divert water from any river to the like extent to which he may lawfully have made any such diversion.

Note that the Minister may, after consultation with the State Authority, by order, except from the operation of this Act any artificial channel or watercourse.

45. NATIONAL PARKS ACT 1980

This is an Act to provide for the establishment and control of National Parks and that the State Authority may on the request of the Minister reserve any State land within the State (including any marine area) for the purpose of a National Park under a name to be assigned to it.

46. NORTHERN CORRIDOR IMPLEMENTATION AUTHORITY ACT 2008

This is an Act to incorporate the Northern Corridor Implementation Authority ("**Authority**"), for the management of developments within the Northern Corridor Economic Region (NCER) and to provide for co-ordination between government agencies to promote trade, investment and development within the NCER, and to provide for matters connected therewith or ancillary thereto.

Pursuant to this Act, the Authority is to, inter alia, integrate national and state strategies in formulating strategies in the draft NCER Development Plan in relation to environmental protection, conservation and management of natural resources located within the NCER. The draft NCER Development Plan shall consist of written statements and inter alia, shall formulate, in such detail as the Authority thinks appropriate, its proposals for planning and implementation initiatives to realise the strategies which shall include initiatives relating to the protection, management, preservation and enhancement of natural environmental resources, agricultural resources, sensitive coastal ecosystems, highlands, forests, parks and open spaces in the NCER including the improvement of water, energy and waste management in the NCER.

47. PADI CULTIVATORS (CONTROL OF RENT AND SECURITY OF TENURE) ACT 1967

This is an Act relating to the control of rent and security of tenure of padi cultivators and matters incidental thereto.

The relevancy of this Act relates to the implied conditions of a tenancy agreement and the implied condition is that the tenant shall defray all expenses and perform all work necessary for the construction and the putting and keeping in order of any dams, water-wheels, water-courses, division ridges and fences and such other matters as may be prescribed by law to be payable by the occupier of the land.

48. PENANG PORT COMMISSION ACT 1955

This is an Act relating to the Port Commission for the Port of Pulau Pinang, and for purposes connected therewith.

The Act provides that any quay wharf, jetty, pier or other public work constructed by the government along or out from the foreshore which is situated within the limits of the port of Pulau Pinang, and the land on which the same is constructed, and any land reclaimed from the sea, and any landing place or part of the foreshore situated within the limits aforesaid, may be vested in the Commission upon such terms and conditions and subject to such restrictions as the Governor may determine.

Additionally, the Commission may levy, in accordance with a scale which it shall frame, and may alter, rates for the water supplied by the Commission. According to the Act also, the Commission is also empowered to make by-laws for keeping clean the basins, works and premises of the Commission and the waters adjacent thereto, and for preventing filth and

rubbish being thrown or entering therein or thereon and to supply water to shipping in the port.

49. PERBADANAN LABUAN ACT 2001

An Act to repeal the Lembaga Pembangunan Labuan Act 1992 and to revoke the Labuan Municipal Council Instrument 1983. Additionally, pursuant to this Act, the Lembaga Pembangunan Labuan and the Labuan Municipal Council is dissolved. This Act also establishes the Perbadanan Labuan "Perbadanan" in place of the Lembaga Pembangunan Labuan and the Labuan Municipal Council.

Amongst the functions of the Perbadanan is to to promote, stimulate, facilitate and undertake the development of tourism and infrastructure as well as residential, agricultural, industrial and commercial development in the Federal Territory of Labuan. The Perbadanan is also vested with all the functions of a local government and the local planning authority in the Federal Territory of Labuan.

50. PERBADANAN PEMBEKALAN LETRIK SARAWAK ACT 1983

This is an Act to provide for the establishment of the Perbadanan Pembekalan Letrik Sarawak where the corporation may purchase, construct, reconstruct, maintain and operate supply lines, generating stations, transformer stations, and all other appropriate stations, buildings and works, including, subject to compliance with the provisions of any written law relating to the issue of water licences for the time being in force, the abstraction of water from any lake, river, stream or other natural source, and the doing of all such acts as may be necessary for the purpose of utilising and returning or otherwise disposing of the water so abstracted.

It also provides that the corporation shall undertake the duty to the development of water power resources in the state, and to establish generating stations operated by hydro power for the generation or transmission of electricity in accordance with the provisions of any written law for the time being in force relating to hydro power. The corporation also has the powers to break up streets, sewers, drains and tunnels and shall be reinstated by the corporation without unreasonable delay.

51. PERBADANAN PUTRAJAYA ACT 1995

This is an Act to incorporate the Perbadanan Putrajaya and the Perbadanan with the approval of the Minister, make such regulations in regulating the development of land in the Federal Territory of Putrajaya and generally providing for the orderly development of land in the Federal Territory of Putrajaya and regulating any activity, service or works undertaken in any public place, park, walk, recreation ground, pleasure ground, garden, swimming pool, lake, river, wetland, stadium, building or site.

52. PETROLEUM DEVELOPMENT ACT 1974

This is an Act to provide for exploration and exploitation of petroleum whether onshore or offshore by a Corporation in which will be vested the entire ownership in and the exclusive rights, powers, liberties and privileges in respect of the said petroleum, and to control the carrying on of downstream activities and development relating to petroleum and its products; to provide for the establishment of a Corporation under the Companies Act 1965 [*Act 125*] or under the law relating to the incorporation of companies and for the powers of that Corporation; and to provide for matters connected therewith or incidental thereto.

Note that according to this Act, the entire ownership in, and the exclusive rights, powers, liberties and privileges of exploring, exploiting, winning and obtaining petroleum whether onshore or offshore of Malaysia shall be vested in a Corporation to be incorporated under the Companies Act 1965 or under the law relating to incorporation of companies.

In addition to all the powers of the Corporation as prescribed in its Memorandum and Articles of Association, the Corporation shall have the power to take over or acquire by agreement, assignment, purchase or by any other means the whole or any part of any commercial undertaking, business or enterprise of whatever form of any person or body of persons (corporate or unincorporate) and carry out or enter into any activity, whether mentioned in this Act or not, which prior to such taking over or acquisition was carried out by, and for the purpose of, that undertaking, business or enterprise.

According to this Act, the Prime Minister may make regulations for the purpose of carrying into effect the provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may, in particular, provide for, among others, the conduct of or the carrying on of any business or service relating to the exploration, exploitation, winning or obtaining of petroleum.

53. PETROLEUM (SAFETY MEASURES) ACT 1984

This is an Act to consolidate laws relating to safety in the transportation, storage and utilization of petroleum.

This Act provides that it is unlawful for any person to undertake any pipeline works to be executed in or on land, on the surface of or underwater, onshore or offshore except under authorisation granted by the of Ministry Natural Resources and Environment.

54. PETROLEUM MINING ACT 1966

This is an Act to make provision with regard to mining for petroleum and for matters connected therewith.

This Act provides that the Petroleum Authority may make regulations which provides for the establishment of safety areas around any petroleum reserve installations erected on the sea bed, provided that no safety area around petroleum mining installations erected on offshore land beyond territorial waters shall be required to exceed 500 metres in radius.

Note that the Petroleum Authority shall in relation to an application in respect of an area of on-shore land, be the Ruler or the Yang di-Pertua Negeri of the State in which the area of on-shore land is situated; and in relation to an application in respect of an area of off-shore land, be the Yang di-Pertuan Agong.

55. PORT AUTHORITIES ACT 1963

Pursuant to this Act, the Authority, has the power to, inter alia, supply water to shipping in the port. Additionally, the Authority may prescribe charges or scales of charges and impose penalties or interests on outstanding dues in respect of, inter alia, the water supplied by the authority.

Additionally, the Authority may, with the approval of the Minister, make by-laws for, inter alia, keeping clean the basins, works and premises of the Authority and the waters adjacent thereto, and preventing oil filth and rubbish from being thrown or from entering therein or thereon.

56. PORTS (PRIVATISATION) ACT 1990

This is an Act to facilitate privatization of the port undertakings of any port authority and with the approval of the relevant Minister, may make by-laws to provide for the cleanliness of the basins, works and premises within the limits of the port and to prevent pollution of the waters therein.

57. SOLID WASTE AND PUBLIC CLEANSING MANAGEMENT ACT 2007

This is an Act to provide for and regulate the management of controlled solid waste and public cleansing for the purpose of maintaining proper sanitation.

Under the Act, no person shall construct any prescribed solid waste management facilities unless the relevant plans or specifications which require the approval of the Director General of Solid Waste and Public Cleansing Management.

Additionally, no person shall undertake any alteration of any prescribed solid waste management facilities which may cause adverse environmental impact.

For the purpose of enforcing the Act, the authorized officer may take samples of any material or substance found at solid waste management facilities, on land, air or water.

58. SOLID WASTE AND PUBLIC CLEANSING MANAGEMENT ACT CORPORATION ACT 2007

This is an Act to provide for the establishment of the Solid Waste and Public Cleansing Management Corporation with powers to administer and enforce the solid waste and public cleansing management laws and for related matters.

The functions of the Corporation are, inter alia, to implement such policies, plans and strategies including schemes as decided by the Federal Government, to implement measures as decided by the Federal Government for the improvement of any existing solid waste management services and public cleansing management services and to recommend the standards, specifications and codes of practice relating to any aspect of solid waste management services and public cleansing management services to the Federal Government.

59. STREET DRAINAGE AND BUILDING ACT 1974

An Act to amend and consolidate the laws relating to sreet, drainage and building in local authority areas in West Malaysia, and for purposes connected therewith.

The Act empowers the local authority to cause to be made, constructed and maintained surface and storm water drains, culverts, gutter and watercourses. If necessary, the local authority may request the State Authority to acquire any property in accordance with any law relating to the compulsory acquisition of lands for the time being in force in the State.

It also provides that no person shall:

(a) erect upon any premises any building;

(b) rebuild any building which has been pulled down to or below ground floor; or

(c) occupy any building so newly-built or rebuild,

unless surface or storm water drains, culverts, gutters and watercourses of such specification as may be prescribed by the local authority, are provided on such premises to carry off waters other than sewage.

The local authority shall maintain, keep in repair or otherwise improve all or any of the surface and storm water drains, culverts gutters and watercourses under it and may discontinue, close up or destroy such of them as it deems useless or unnecessary.

This Act also required the local authority to cause the surface and storm water drains, culverts, gutters and watercourses under it to be so constructed, maintained and kept as not to be a nuisance or injurious to health and to be properly cleared, cleansed and emptied and, for the purpose of flushing, cleansing and emptying the same, it may construct and place, either above or underground, such reservoirs, sluices, engines and other works as are necessary.

60. SURUHANJAYA PERKHIDMATAN AIR NEGARA ACT 2006

This is an Act which provides for the establishment of the Suruhanjaya Perkhidmatan Air Negara ("SPAN") with powers to supervise and regulate water supply services and sewerage services.

Pursuant to the Act, the function of the Commission revolves on matters in relation to the national policy objectives of the water supply and sewerage services laws and the implementation and enforcement of the water supply and sewerage services laws.

In addition, the Committee must also ensure the productivity of the water supply services and sewerage services industry and the long-term sustainability of quality of water and sewerage services through continued capital works development.

The Committee must also formulate and implement a plan so that all reasonable demands for sewerage services are satisfied and the Committee must consult with the relevant authorities to prepare a sewerage catchment plan formulating the policy and general proposals in respect of the development of any new sewerage system and measures for improvement of any existing sewerage system.

61. TOWN AND COUNTRY PLANNING ACT 1976

This is an Act for the proper control and regulation of town and country planning in Peninsular Malaysia and for purposes connected therewith or ancillary thereto.

Under the Act, functions of the local planning authority include regulating, controlling and planning the development and use of all lands and buildings within its area and to perform such other functions that the State Auhtority may form time to tme assign to it.

The Act also provides that no person shall use or permit to be used any land or building otherwise than in conformity with the local plan prepared by the local planning authority,

In the Act, "land" includes, inter alia, land covered by water.

62. WATER SERVICES INDUSTRY ACT 2006

WSIA entered into force on 1 January 2008 and only applies to Peninsular Malaysia and Federal Territory of Labuan. Upon its enactment, two major sets of existing legislations are repealed namely The Sewerage Services Act 1993 is repealed in respect of its application to Peninsular Malaysia and the Federal Territories of Putrajaya and Labuan and The State Water Supply Enactments are repealed in respect of its application in the states of Peninsular Malaysia and/or amended or replaced with new legislations.

Nonetheless, any subsidiary legislations made under the repealed legislation will remain in operation until revoked or replaced by any subsidiary legislation made under the WSIA, and shall be deemed for all purposes to have been made under the WSIA. This would include:

(a) existing rate and charges for water supply and sewerage services;

(b) technical and design standards;

(c) plan approval processes for new development;

(d) water contribution charges;

(e) contractors and plumber licenses;

(f) material approvals and etc.

Pursuant to this Act, it allows the Federal Government to provide and regulate the treated water supply services and sewerage services which was formerly under the responsibility of the state authorities. It however does not encroach nor effect the general application of existing laws on environmental quality and land matters and existing state powers over the water source.

It is also meant to ensure uniformity of the laws, policies for the proper control and regulation of water supply services and sewerage services from treatment of raw water to the discharge of waste water.

Additionally, WSIA also provides opportunity to the consumers to be involved with the industry through the water forum. Water forum will be representing the consumers in voicing their concern, opinions and suggestions. Through the Water Forum, the consumer may propose consumer standards which shall include model procedure for to meet consumer requirements, handling of consumer complaints and disputes and the protection of consumer information.

63. WATER SUPPLY (FEDERAL TERRITORY OF KUALA LUMPUR) ACT 1998

This is an Act which provide for the law relating to the supply and distribution of water in the Federal Territory of Kuala Lumpur and for matters incidental to it.

According to the present Act, it mentions that the authority responsible for the supply and distribution of water in the State of Selangor shall exercise, on behalf of the Government of the Federation, the powers and functions under the law applicable to the Federal Territory of Kuala Lumpur on matters relating to the supply and distribution of water in the Federal Territory of Kuala Lumpur. However, it shall not preclude the Government of the Federation from exercising on its own behalf the powers and functions relating to the supply and distribution of water under the law applicable to the Federal Territory of Kuala Lumpur.

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
AUGUST 2011

Annex 3.3 – Summarised Review of State Enactment

SUMMARISED REVIEW OF STATE ENACTMENT

(A summary of the review is given below, with the detailed separately in a CD attached in this Report)

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(1) JOHOR

(i) Waters Enactment 1921

This Enactment expressly provided for the control and property of the entire river is vested solely in the Ruler of the State except for lands that are held and/or reserved by the Government Department, the control thereof is exercised by the Head of such departments under the direction of the His Highness the Sultan in Council.

Further, any act inclusive but not limited to felling any tree into a river, interference with the course of the river and diversion of water requires a licence (which may be subject to the imposition of conditions) from the Commissioner of Lands and Mines.

(ii) Mineral Enactment 2003

This is Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. This Enactment also make express reference to the applicability of other general written law and also specifically to the Drainage Works Act 1954.

(2) KEDAH

(i) Water Resources Enactment 2007

An Enactment to provide for the integrated management of the use, development and protection of water resources in the State of Kedah.

Pursuant to this Enactment, the Water Resources Board as established has the authority to, inter alia, to approve development projects relating to integrated water resources management for submission to appropriate State or Federal Authorities, to divide the State into river basins districts and to advise the State Authority in formulating or reviewing legislations and directives and procedures for the implementation of integrated water resources management.

Additionally, the Water Resources Director has the authority to take all reasonable measures as deemed necessary to remedy adverse effects on the environment such as contamination as well as sediment and storm water control.

Further, this Enactment also provides for the State Authority to declare water conservation areas for, inter alia, the intended use thereof as a water catchment area.

(ii) Mineral Enactment 2004

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. It must be noted however that this Enactment (in relation to water related provisions) prevails and is to have effect notwithstanding anything contained in any other written law regarding water.

(3) MELAKA

(i) Mineral Enactment 2002

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. Further, this Enactment does not provide for cross-references with any other law(s) regarding to water.

(ii) Malacca River And Coastal Development Corporation Enactment 2005

Pursuant to this Enactment, the Melaka River and Coastal Development Corporation ("Corporation") is established to administer and manage the development of rivers and coastal situated within the State of Melaka on behalf of the State Government.

Members of the Corporation includes the Chief Minister of Melaka, the State Secretary, the State Legal Adviser, the State Financial Officer and three representatives from the Federal Government to be appointed by the Minister.

Amongst the detailed functions of the Corporation as provided for under the Enactment includes adopting and implementing policies issued by the State Government, to conserver rivers and coasts and to protect the interest of the State in respect of managing the development of rivers and coasts.

(4) KELANTAN

(i) Mineral Enactment

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. It must be noted however that this Enactment (in relation to water related provisions) prevails and is to have effect notwithstanding anything contained in any other written law regarding water.

(5) NEGERI SEMBILAN

(i) Mineral Enactment 2002

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. Further, this Enactment does not provide for cross-references with any other law(s) regarding to water.

(iii) Quarry Rules 2009

Under this rules, a Quarry Inspector has the authority to control the disposal of all refuses from, inter alia, any quarry, water-course and other places. The Quarry Inspector also has the power to order that precautions are taken inclusive of, inter alia, the construction of dams and channels to ensure that such refuse shall not be carried or washed by water.

(6) PAHANG

(i) Mineral Enactment 2001

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

This Enactment provides that the act of fossicking, dulang, mining and exploration require a licence. In performing these operations, the licensee is entitled to the enjoyment of water as may be found on the land. Nonetheless, the licensee shall not, inter alia, make, cause or permit to be made, any alteration in the water supply of any land for the purposes of the mineral tenement as may prejudicially affect the water supply enjoyed by any other persons or lands and divert or cause to be diverted any water supply from lands outside the area covered by the mineral tenement to the land which is the subject of the mineral tenement, except under the authority and in accordance with the terms or conditions of a licence or permit issued.

Note also that the licensee must apply for a water licence in order to utilize the water supply. The water licence also comes with terms and conditions attached i.e. no person shall, in the enjoyment of a mineral tenement, alter or interfere with, or cause or permit to be altered or interfered with, the banks of any river, stream or watercourse banks, unless such alteration or interference is permitted in a water licence or such person has obtained the written permission of the Director in charged or the Superintendent of Mines. Note that every holder of mineral tenement who uses water in connection with mining operations shall before it is discharged into any river, stream or watercourse comply with such water quality standards as may be prescribed by this Enactment or the Environmental Quality Act 1974.

(ii) Water Resources Enactment 2007

This is an Enactment relating to the control of water resources and abstraction of raw water in the State of Pahang and for matters incidental thereto.

This Enactment provides that the State Authority shall have the overall responsibility for the control, management and regulation of water resources and raw water in Pahang. Nonetheless, the State Authority may authorize any supply authority or any person to carry out the control and management of water resources and raw water. Additionally, the State Authority may appoint a public officer to be the Director of Water Resources in which the duties, inter alia, are to exercise regulatory functions in respect of water resources and raw water including the determination of standards of facilities, and services, and the performance and enforcement thereof, to ensure that all reasonable demands for raw water are satisfied, and to promote and encourage the abstraction and supply of raw water with a view to the economic development of Pahang. Note also that licences are required, inter alia, to maintain or operate or permit to be used or operated any system for the supply of raw water, and to operate or manage any facilities for the abstraction, diversion or supply of raw water, for the

purpose of providing water supply or services under the Water Services Industry Act 2006 or for use in generation of electricity, agriculture, industry or any other purposes.

According to this Enactment, approval is required for the construction or extension of the raw water supply system. Also, note that it is an offence to lay or construct pipes outside raw water supply areas, pollute, damage raw water supply system, divert water resources, and tamper with raw water supply system.

(7) PERAK

(i) Mineral Enactment 2003

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. Further, this Enactment does not provide for cross-references with any other law(s) regarding to water.

(ii) Waters (Amendment) Enactment 2009

The State of Perak had ratified the Waters Act 1920 on the 18 September 1920.

This Waters (Amendment) Enactment 2009 serves to amend certain provisions of the Waters Act 1920 by either inserting new and/or deleting certain provisions in the Waters Act 1920. This is to update its applicability and implementation of the Waters Act 1920 in the State of Perak.

(8) SELANGOR

(i) Waters Management Authority Enactment 1999

This is an Enactment that establishes the Selangor Waters Management Authority ("**Authority**") to manage and protect river basins, water bodies, ground water, coastal waters and wetlands.

Members of the Authority include the Menteri Besar, State Secretary, State Legal Adviser, State Financial Officer and the Director General of the Federal Drainage and Irrigation Department.

Amongst the functions of the Authority is to provide advice to the State Authority in relation to the promotion and facilitation of water sources for public purposes and for conservation purposes as well as to regulate and control inter basin transfer of water within State.

Further, the Enactment also provides for the establishment of zones of protection and buffer zones for rivers for purposes of safeguarding any water source, reservoirs and environmentally sensitive coastal areas.

Additionally, the State Auhtority has the authority to declare any area to be a designated area for river basin, water catchment, wetland or water body.

(ii) Mineral Enactment 2000

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. It must be noted however that this Enactment (in relation to water related provisions) prevails and is to have effect notwithstanding anything contained in any other written law regarding water.

(9) TERENGGANU

(i) Quarry Rules 2007

Under this rules, a Quarry Inspector has the authority to control the disposal of all refuses from, inter alia, any quarry, water-course and other places. The Quarry Inspector also has the power to order that precautions are taken inclusive of, inter alia, the construction of dams and channels to ensure that such refuse shall not be carried or washed by water.

(10) PERLIS

(i) Control Of Rivers And Streams Enactment 1957

This Enactment expressly provided for the control and property of the entire river is vested solely in His Highness the Raja except for lands that are held and/or reserved by the Government Department, the control thereof is exercised by the Head of such departments under the direction of the State Council.

Further, any act inclusive but not limited to felling any tree into a river, interference with the course of the river and diversion of water requires a licence (which may be subject to the imposition of conditions) from the Commissioner of Lands and Mines.

(11) PULAU PINANG

(i) Mineral Enactment 2001

This is an Enactment to provide for mineral tenements and for purposes connected therewith.

Under this Enactment, minerals are vested in the State Authority and licences may be issued to individuals for exploration and/or obtaining access and exclusive use of a particular mine area. Right to use water for a mineral tenement holder is dependent upon the issuance of a water permit or a water licence.

Additionally, under this Enactment, every licensee must maintain water standards as provided for under either this Enactment or the Environmental Quality Act. Further, this Enactment does not provide for cross-references with any other law(s) regarding to water.

(12) SABAH

(i) Biodiversity Enactment 2000

The purpose of this enactment is to protect biodiversity including the protection of marine and other aquatic ecosystems. The Sabah biodiversity council as established under the act is to advise state governments on matters relating to the sustainable use and conservation thereof. Access license must be applied from the council to access biological resources found on. inter alia, state lands, reserves or customary lands or any other areas including rivers, waterways and territorial waters of Malaysia.

(ii) Cultural Heritage (Conservation) Enactment 1997

Pursuant to this Enactment, conservation of cultural heritage whether on land or in the sea is vested in the State Government of Sabah and the State Government has the power to make additional regulations as may be necessary for the performance of the above functions.

(iii) Drainage And Irrigation Ordinance 1956

This Ordinance is to facilitate irrigation and agricultural drainage by enabling land areas to be declared for that purpose, setting side areas for the construction of works for water supply or drainage and establishing mechanisms for the maintaining and funding thereof.

(iv) Environment Protection Enactment 2002

An Enactment relating to the protection of the environment which includes, inter alia, all natural resources inclusive of water as well as connected ecosystems.

Pursuant to this Enactment, measure that can be taken by the Environment Protection Council to protect the environment is the use of any land, land reclamation, excavation or dredging of watercourses or altering the course of any river or stream or discharge any pollutant into water, lakes or foreshores.

(v) Forest Enactment 1968

The Enactment provides powers to the Forestry Department of Sabah to manage lands, which have been classified as forest reserves, and to guide forest activities outside of forest reserves. The Enactment however, does not provide for the express protection as to either the quality or quantity of waters in Sabah except to set aside land under the protected category of Forest Reserve for water catchments.

(vi) Ko-Nelayan Enactment 1981

An Enactment to provide for the establishment of a "Korporasi Kemajuan Perikanan dan Nelayan Sabah (Ko-Nelayan)" so as to make provisions for the promotion of the fishing and aquaculture industries in Sabah.

Under this Enactment, the objective of the Ko-Nelayan if to improve the economic and social well-being of the fishing community as well as to increase the production of the fishing industry and the accelerated development of aquaculture.

(vii) Local Government Ordinance 1961

Under this Ordinance, it gives Local Authorities broad service functions an provides considerable range of control over local activities. The Ordinance also provides for water-related responsibilities such as the controlling of drainage, sewerage, control of development of buildings and planning and control of pollution.

(viii) Mineral Enactment 1999

An Enactment to provide for mineral tenements and purposes connected therewith. Mineral exploration requires a license under this enactment and the entitlement of a mineral tenement holder to enjoy water as may be found on land without causing alteration in the water supply or to wrongfully obtain water from an river or watercourse flowing over or under such land.

(ix) Mining Ordinance 1960

The mining ordinance controls prospecting and mining in Sabah. It establishes a system of permits, which control mining activities, issued by the Director, with the

approval of the Minister. Additionally, issued licenses may be subjected to further conditions if it involves with the interferences with the flow or with the banks of any river, creek, stream and watercourse.

(x) Parks Enactment 1984

The Sabah Parks Enactment establishes the six parks in the State of Sabah. It also establishes the Board of Trustees for Sabah Parks. The board includes the Secretary of the responsible Ministry and the Secretary for Natural Resources. The Board is responsible, among other things, for the control of activities in respect of all parks in Sabah and recommending government policies, measures and methods for the development thereof

(xi) Ports And Harbours Enactment 2002

An Enactment to provide for the control and regulation of traffic by water in ports and harbours and on rivers wholly within Sabah and in the foreshores and shipping under fifteen registered tons. The State Director of Ports and Harbours appointed in accordance with the Enactment shall also have the power to make regulations to, inter alia, prevent erosion and damage to foreshores and river banks caused by marine craft wash and to prohibit the use of certain river or watercourses by vessels if deemed necessary.

(xii) Ports Authority Enactment 1981

An Enactment to repeal and re-enact the law relating to the establishment of a Sabah Ports Authority so as to make better provisions respecting the constitution, administration, procedure, functions and finance of the Sabah Ports Authority. The Ports Authority also have the power to levy charges to the supply of water as may be necessary in the management of the ports.

(xiii) Public Health Ordinance 1960

Under this Ordinance, it imposes a duty on local authorities to prevent pollution that are dangerous to health of any water supply except for piped water supply. Additionally, the Director of Health Services may define minimum standards of purity and freedom of pollution by issuance of notice to the local authority or by order to the owner of the water supply.

(xiv) Sabah Inland Fisheries And Aquaculture Enactment 2003

An Enactment to provide for the sustainable development and management of inland fisheries and aquaculture in the State of Sabah. The Enactment also provides for the enhancement and productivity of aquatic species as well as the power to make regulations in relation the regulation and control of any slide, dam or other obstruction to protect fish in riverine waters.

(xv) Sabah Land Ordinance

The Land Ordinance is the legal means for determining the status of land in Sabah. Under the land management system in Sabah, land, unless alienated, remains State Land. Additionally, it is a law for development and control of land. At the time of it's drafting, the primary goal was to encourage the occupation of land for agricultural development.

Under this Ordinance, it also provides the State Authority the power to set aside from alienation river reserve, to conduct temporary occupation activities on State Land and to reserve land for 'public purposes'.

(xvi) Sabah Water Resources Enactment 1998

An Enactment to provide for the sustainable management of the water resources of the State of Sabah. It is also to promote the orderly, equitable and efficient use of water. Pursuant to this Enactment, a Water Resources Council is established to, inter alia, protect river and shore reserves, plan for the orderly development and use of water resources and to manage water protection areas. Additionally, the Council shall also develop catchment management plans for the whole of the State.

(xvii) Sabah Water Supply Enactment 2003

Pursuant to this Enactment, the State Water Authority is the custodian and shall be responsible for the management and administration of the water supply system within the State of Sabah. Any other entity wishes to undertake or manage water supply must obtain license from the State Water Authority.

Other additional functions of the water State Authority under the Enactment is, inter alia, to ensure the quality of supplied water and to prosecute any offence under this Enactment.

(xviii) The Merchant Shipping Ordinance, 1960

An Ordinance that allows for water quality and quantity to be inspected upon complaints by any North Borneo ship crew members.

(xix) Town And Country Planning Ordinance

The Ordinance sets out the general procedures to be followed in developing planning schemes for gazettal ad adoption by local authorities and the Government. Under the Ordinance, the local authorities have the power to implement approved development plans that extend to the removing, pulling down or altering any building or other work so as to bring them in conformity with the approved scheme, prohibit buildings from being used and the compulsory acquisition of land.

(xx) Water Regulations 1961

To regulate the distribution of water through pipes under the management of the water Authority.

(xxi) Wildlife Conservation Enactment 1997

An Enactment to make provisions for the conservation and management of wildlife and its habitats in the State of Sabah.

Pursuant to this Enactment, the Director of Wildlife has the responsibility to, inter alia, promote the farming of animals and cultivation of plants and to develop the facilities including structures, roads, trails, bridges, airfields, fences and water supplies necessary for the operation of Wildlife Sanctuaries and Wildlife Hunting Areas.

(13) SARAWAK

(i) Electricity Ordinance

An Ordinance to provide for the preservation and protection of greens in special areas; the creation of more green area and the control and management of public parks and special areas.

Pursunat to this Ordinance, A State Water Authority is established and in relation to hydroelectricity under the Ordinance, it requires a licence where restrictions and conditions may be imposed by the Yang di-Pertua Negeri in relation to, inter alia, diversion of waters of any river, to open and break up sewers and drains,

(ii) Forest Ordinance 1954

An Ordinance to provide for the protection and management of the forests of Sarawak and to regulate the taking of forest produce.

(iii) Local Authorities Ordinance 1996

An Ordinance to consolidate the laws on local authorities in Sarawak and to make better provisions relating thereto.

Pursuant to this Ordinance, it provides the Local Authority with the power to take measures in protecting the environment, ensure the sanitation and cleanliness, to control over public roads and the power to undertake sewerage and drainage works.

(iv) Merchant Shipping Ordinance, 1960

An Ordinance that allows for water quality to be inspected upon complaints by Sarawak ship crew members.

(v) Mineral Ordinance, 2004

An Enactment to provide for mineral tenements and purposes connected therewith. Mineral exploration requires a license under this enactment and the entitlement of a mineral tenement holder to enjoy water as may be found on land without causing alteration in the water supply or to wrongfully obtain water from an river or watercourse flowing over or under such land.

(vi) National Parks And Nature Reserves Ordinance 1998

Pursuant to this ordinance, a Controller of National Parks and Nature Reserves is appointed to supervise and national parks which includes land, inland waters, national waters and nature reserves.

(vii) Natural Resources And Environment Ordinance 1958

Pursuant to this ordinance, the natural resources and environment board has the jurisdiction to determine the mode and manner whereby natural resource can be exploited without damaging the environment inclusive of sources of water supply and inland waters.

(viii) Public Park And Green Ordinance 1993

An Ordinance to provide for the preservation and protection of greens in special areas; the creation of more green area and the control and management of public parks which includes any marine, estuarine or freshwater areas and special areas.

(ix) Regional Corridors Development Authorities Ordinance 2006

An Ordinance to provide for the creation of regional corridors for development and the establishment or appointment of Authorities for such corridors in Sarawak.

(x) Sarawak Biodiversity Centre Ordinance 1997

The purpose of this enactment is to protect biodiversity including the protection of marine and other aquatic ecosystems. The Sarawak Biodiversity Council as established under the act is to advise state governments on matters relating to the sustainable use and conservation thereof. Access license must be applied from the council to access biological resources found on. inter alia, state lands, reserves or customary lands or any other areas including rivers, waterways and territorial waters of Malaysia.

(xi) Sarawak Forestry Corporation Ordinance 1995

Pursuant to this Ordinance, the functions of the corporation is to carry out and implement policies of the government for the sustainable forest management as well

as to manage and administer, inter alia, nature reserves, forest reserves and areas for forestry research and conservation.

(xii) Sarawak Land Code

A code to manage lands in Sarawak. under this code, riparian rights are recognized and that lands may be acquired inclusive of the bed of any river, stream, lake or watercourse as well as the foreshore and beds of the sea within the boundaries of Sarawak.

(xiii) Sarawak River Ordinance 1993

An Ordinance to provide for the control and regulation of traffic by water in ports and harbours or on rivers wholly within Sarawak and in the foreshores. Pursuant to the Ordinance, Sarawak River Board is to, inter alia, to develop and improve the riverine transport system, to ensure cleanliness of the rivers and to prevent erosion of the riverbanks.

(xiv) Sarawak Riverine Transport Bill, 1993

An Ordinance to provide for the control and regulation of traffic by water in ports and harbours or on rivers wholly within Sarawak and in the foreshores. Pursuant to this Bill, rivers within the meaning of this Bill may be gazetted and the Controller of Rivers have the duty to ensure that such rivers are free from pollutants and to prevent obstruction of any watercourse.

(xv) Sarawak Water Ordinance 1994

Under this ordinance, the duties of the council extends to the identification of water resources and to promote and conserve the same, to advise the government in the system of water supply and distribution and to consider any matter affecting such water resources.

(xvi) Sewerage Systems And Services Ordinance 2005

An Ordinance to regulate the sewerage systems and services. pursuant to this Ordinance, an agency is to be appointed to manage and operate the sewerage system including the disposal of sewage and sewag sludge. The authorty or management agency to enter upon land at all reasonbale hours to undertake the abovementioned functions.

(xvii) State Fisheries Ordinance 2003

An Ordinance to regulate fishing and promote aquaculture and to provide for the proper and sustainable management of fisheries in the State of Sarawak. Pursuant to this Act, any person wishing to undertake any such activity thereby affecting such fisheries and/or aquaculture must first obtained a license. Further, in the issuance of

such a license by the relevant authority, additional conditions may be imposed to ensure the protection thereof. Breach thereof is an offence under the Act and is subject to penalty.

(xviii) Wildlife Protection Ordinance 1998

An Ordinance to provide better provision for the protection of wild life, the establishment and management of Wild Life Sanctuaries and all matters ancillary thereto. In exercising its functions under this Ordinance, the Controller may exercise any such rights over any land and to offer compensation to any effected owner. Further, the Controller must also ensure the sanctity and protection of natural reserve that includes land, inland waters and territorial sea.

13. WATERS ACT 1920

The Waters Act 1920 is a legislation that provides for the control of rivers and streams. Pursuant to this Act, the entire property and control of rivers in any State is and shall be vested solely in the Ruler of such State. Waters Act 1920 is applicable only to the State of Negeri Sembilan, Pahang, Perak, Melaka, Pulau Pinang and the Federal Territory of Kuala Lumpur.

Pursuant to the Act, any person who interferes with the bank of any river, by order of the State Authority, be required to restore the same to the condition before the interference.

Unless licensed by the District Officer with the approval of the State Authority, no person shall fell any tree into a river, obstruct or interfere with any river or build any bridge, jetty or landing stage (other than a bath house), over or beside any river at a point where the width of such river exceeds 20 feet.

Unless licensed by in accordance with the Act or expressly authorized by any other law, no person shall, by means of any ditch, drain, channel, pipe or otherwise divert water of any river from its natural course.

Save as maybe expressly authorized under any written law, the Act also prohibits the discharge of certain pollutants into any river unless licensed under the Act. Such license maybe granted by the State Secretary.

The Act also provides that unless authorized by any other law, no person shall erect or build any wall or construct any revetment along the bank of any river or erect any building or structure within 50 feet from any such bank or within any flood channel declared under the Act except with the written permission from the State Authority.

If the State Authority is satisfied that the bank of any river is insufficient to contain the waters thereof in time of floods, it may, by notification in the gazette declare any land abutting on such river and extending to such distance from the banks as maybe specified in such notification to be a flood channel.

Note that the respective state river enactments (reference to the state of Perlis, Kedah and Johor) also contain similar provision. It must also be noted that Selangor had enacted the Selangor Waters Management Authority Enactment 1999 and has repealed the application of Waters Act in that state.

(14) COMMON LAW

Riparian rights is an established English common law principle in which the riparian owner is entitled in the natural course of things to access and regress from the water that abuts his land ("riparian tenement") regardless of whether it is a tidal or non-tidal river, a lake, or the sea, where it is in contact with his frontage, provided his land is in actual daily contact with the water, either laterally or vertically. It is a private right and any interference with it is actionable without proof of special damage. English common law principles established before 1956 can be used in Malaysian law by virtue of the Civil Law Act 1956.

Generally, a riparian owner has the right to the continuance of flow of water and is entitled to make certain uses of the water which comes to him whilst it is on his property. However, the right of a riparian owner to the flow of water is subject to certain qualifications with respect to the quantity of water which he is entitled to receive. He must not use and apply the water so as to cause any material injury or annoyance to his neighbours opposite, above or below him, who have equal rights to the use of the water and an equal duty towards him.

In the case of Alex Pirie & Sons Ltd v Earl of Kintore [1906] AC 478, it was held that an abstraction of water by a lower riparian owner which prevents fish ascending the stream may be restrained by an upper riparian owner.

As such, the extent of which a riparian owner may take and use water from a stream flowing past, through or under his land in a known and defined channel in lawful exercise of his riparian rights depends on the purpose for which he takes the water. If the usage is for ordinary or domestic purposes, the lower riparian owners may not complain in the event such purposes exhaust the water in the stream[1].

On the other hand, if the extent of the use is for extraordinary purposes (other than for the ordinary and domestic purposes), the user must be reasonable in that it does not interfere with the rights of other riparian owners, the water must be taken in connection with the riparian tenement, and that the water taken must be returned to the stream substantially undiminished in quantity and unaltered in character[2].

1 Attwood v Llay Main Collieries Ltd [1926] Ch 444.

2 Baily & Co v Clark, Son and Morland [1902] 1 Ch 649; McCartney v Londonderry and Lough Swilly Rly Co [1904] AC 301.

Annex 3.4 – Review of Comparative Practices in Selected Jurisdictions

ANNEX 3.4 - REVIEW OF COMPARATIVE PRACTICES IN SELECTED JURISDICTIONS

A. INDONESIA

1. Introduction

(i) Indonesia intends to develop and manage water resources on a holistic and integrated manner in order to support sustainable development in line with the nation's second 25-year development period 1994-2019. Under the Indonesian Constitution, water is part of human rights and a natural resource which shall be controlled by the State. The current applicable law is the Water Resources Law which places its focus on water conservation, infrastructure and its management, targeted at surface and groundwater. The purpose of the Water Resources Law (WRL) is to achieve a balance between the availability of water (which is decreasing) and the need for water (which is increasing).

(ii) Water is crucial for the production of agriculture in Indonesia. Its water resources include rainwater, groundwater and surface water. The 1945 National Constitution of Indonesia provides that land and water and all natural resources underneath fall under the control of the Government and are to be exploited as much as possible for the prosperity of the whole nation (Article 33). Under the Indonesian Constitution, the words "under the control" is understood to mean that all exploitation of natural resources by any individual or group, which includes land and water having economic value and social function, will be controlled by the government. In any event, any such exploitation is undertaken on a sustainable basis ensuring maximum benefit for the people.

2. Main Issues

(i) Although Indonesia, like Malaysia, is a humid tropical country with high annual average rainfall, it does not escape the problems associated with water. The availability of clean water in term of quantity tends to decrease due to environmental degradation and pollution. Some of main problems faced are:

(a) Rising water demand

There is a strong and competitive demand for water from the agricultural and domestic sector as well as the municipalities and industry. A policy on distribution of water is vital to address this issue.

(b) Lack of upland/upstream land management

Poor management of land in the upper catchment areas without consideration to soil and water conservation gives rise to devastating floods and drought in the lower areas.

(c) Erosion

Decrease in water functions in lakes, rivers, dams and irrigation canals and soil erosion causes siltation and shallowing processes.

(d) Population growth

Water pollution tends to increase with population increase and sectoral development that produces pollutant or byproducts.

(e) Inefficient irrigation water management

Damages to irrigation facility and inappropriate irrigation water application at farm levels may cause uneconomic or overuse of irrigation water.

(f) Extreme climatic change

Abnormal global climatic changes such as El Nino or La Nina can cause flood and drought

(g) Over - pumping of groundwater

Over pumping of groundwater without considering discharge capacity has created intrusion of sea water and groundwater pollution.

(h) Weak water user associations

Poor irrigation water management at farm level. Out of the reported 39 000 existing or newly created water user associations, only 11 000 units (28 percent) were in fact developed enough to function properly.

3. Policy on Land and Water Resources Development

(i) Agriculture is of national importance to Indonesia. In giving effect to its national agriculture development policy, the support from land and water resources development are vital for the successful implementation of the said policy. Based on these circumstances, the Indonesian government launched a set of general and specific policies on land and water resources development. Evaluating the effectiveness of these policies is continuous, to improve their substance and content depending on actual situations and conditions. In its efforts to resolve the existing problems faced in water resources development, the following are some of policy initiatives taken by Indonesia:

(a) To conserve water

Conservation efforts include preventing water losses and improving the water holding capacity of soil. This is intended to maximize infiltration and

percolation of rainwater into the ground and to minimize loss of rainwater as surface runoff. Percolated rainwater can be stored as groundwater and surface water can be stored in dams or other water storage. One of the proposed future policy is to increase the number of small scale dams and ponds to serve as water reservoirs to supply irrigation water during the dry season.

(b) To encourage a national water saving movement with all members of the community as water users. This step aims to avoid wasteful use of water in all phases of distribution or conveyance. It is principally an effort to change the attitudes, habits or customs of the community as well as government employees to use water more efficiently. This is considered a challenging task which will take time. Implementation of this policy will be continuous and consistent to allow attitudes to change.

(c) To carry out reforestation and re-greening in upper catchments and to implement soil conservation farming in slope areas.

(d) To improve the operation and maintenance (O&M) of all irrigation infrastructure for optimal functioning.

(e) Active participation of farmer or water users' associations is highly encouraged in order to create a sense of belonging among all users of irrigation infrastructure and facilities that have been built.

(f) To prevent water resources pollution from domestic and industrial waste. Legal measures and enforcement is to regulate and control pollution issues related to environment/water resources. Dangerous and toxic pollutants from industrial waste must be treated and protected with strong laws or regulations.

(g) To increase the efficient use of irrigation water. The efficient use of technology and management is to be implemented and developed to increase water use efficiency. The technology that farmers may adopt includes pressurized irrigation (either sprinkler or drip irrigation).

(h) To anticipate climate change particularly global climatic abnormalities creating long drought periods (El Nino) and high rainfall or flooding (La Nina). The Early Warning System which is being introduced is to develop actions and prevention efforts in anticipation of an unexpected disaster so that losses and damages can be minimized. Anticipation approaches include strategic, tactic and operational approach.

(i) To prevent groundwater pollution and seawater intrusion. To achieve this, groundwater pumping must be done carefully in consideration of the recharge capacity. Supervisory systems should be established for

implementation by authorized government institutions at provincial, district or municipal level.

(j) To improve the performance of water user associations in managing irrigation water. The efforts taken should necessarily empower water users' associations in such ways that eventually they should be autonomous, socio-culturally rooted, and environmentally oriented.

4. The Water Resources Law (WRL)

(i) The WRL legalizes the privatization of the water sector and allows private parties to manage water resources. This position contradicted the Constitutional position where water was traditionally administered by the Government. This was resolved by Indonesian Constitutional Court which decided and declared the WRL to be conditionally constitutional and shall be applicable in Indonesia. Prior to the WRL, Law No. 11 of 1974 on Irrigation was the main legal instrument for water management. Any private person who intended to carry out water exploitation project needed to obtain a licence. All forms of exploitation were to be conducted with the spirit of "joint enterprise" and "familial principle". However, this law does not provide for water management and conservation. It emphasized construction and protection of water installation and buildings.

(ii) The first chapter of the WRL contains the standard definitions and general provisions. The second chapter governs responsibility of the institutions related to water management. It provides for dividing and delegating authorities between central, provincial, city/regency and village government in managing water and establishing water councils from the national to village levels. The water councils are mostly advisory bodies. The governmental agency still holds the decision making authority. The third chapter is on water conservation while the fourth chapter regulates water exploitation.

(iii) The Water Resources Law mandates the Government to enact regulations including the following:

(a) government regulation on the protection and preservation of the water sources;

(b) management of water quality and water pollution control;

(c) conservation of water resources;

(d) water source zone;

(e) water resources management plan for each river area, development of river, lake, swamp, and other surface water sources;

(f) development of ground water that exists on land;

(g) development of the drinking water provision;

(h) development of the irrigation system;

(i) development of water resources for industrial and mining purposes;

(j) development of the water resources for energy purpose;

(k) development of water resources as a network of transportation;

(l) prevention of damage and disasters due to the destructive force of water; and

(m) criteria and procedure to determine the river area and the ground water curvature

These Regulations will be considered in detail in the regional and ministerial regulations for water governance in Indonesia.

(iv) Under the Law, both 'water use right' and 'water exploitation right' may not be leased or assigned, partially or entirely. The commercialisation of water is made possible under this Law. A person who has water exploitation right may flow water above another person's land based on approval from the holder of rights over the relevant land. Customary water rights are also recognized under the Law provided that it does not contradict with national interest or the laws and regulations. In order to prove the existence of such right, the Law requires that such right should have been affirmed by the local regional regulations. Under the WRL, new institutions, mechanisms and bureaucratic structure will be set up.

(v) Besides the WRL, there is also a Draft National Resources Policy Action Plan for Indonesia. In the Draft National Resources Policy Action Plan 1994-2020, the policies and objectives for water resources management are detailed out. The Plan lays down the action plans pertaining to water utilization, water quality, water resources development and water resources management structure. Some of its objectives are as follows:

(a) to make efficient and equitable allocation and utilization of surface and groundwater among sectors in light of long term impacts;

(b) to link water sectors with and respond to demographic shifts and changes in the social and economic sectors;

(c) to adopt water allocation to ecosystem;

(d) to issue and enforce guidelines for implementation of water licensing regulation;

(e) to establish a River Basin Planning process interactive with mainstream planning for preparation of NWRDP;

(f) to establish and implement participatory and interactive process for EIA of River Basin;

(g) to draft and implement legislation regulating River Basin Planning consistent with Spatial Land Use Planning;

(h) to establish a sustainable budget system for water resources management;

(i) to plan programme approach for water resources development; and

(j) to create water resources management structure consistent with integrated management objectives.

(vi) The new law is said to be weak in certain ways by many legal activists and the people of Indonesia. The concept of privatization offered under the WRL is not totally welcomed by all. Citizens in rural areas are still highly dependant on the Government, therefore the provisions of the WRL should be applied cautiously.

(vii) In conclusion it is not clear at this stage as to what extent the WLR in Indonesia will be effected on river basins in Indonesia. Whilst "privatisation" has occurred it is not clear as to what extent the other provisions in the law will be implemented.

B. EUROPEAN UNION COUNTRIES

1. Introduction

(i) Historically, the European Union Water Policy was largely developed through a series of five Environmental Action Programmes between the period of 1973 and 2000. Several priority issues were identified under these Action Programmes to reduce water pollution and improve water quality and various directives on specific issues were formulated, including bathing water quality or dangerous substances. However, because many directives resulted in a fragmented and sometimes conflicting approach for EU water policy. Subsequently, a new and more integrated approach to water management was developed which resulted in Water Framework Directive (WFD) being adopted in 2000.

(ii) The WFD replaced many of the earlier directives and takes a more holistic approach to water management. EU Member States and Candidate Countries are seeking to incorporate the provisions of the WFD into their respective national legislation. It provides common principles, approaches and requirements for water management in the European Union as follows:

(a) provides a legal framework for managing ground and surface water;

(b) aims to ensure that the environmental costs of supplying water are included in the water price;

(c) entails an obligation on Member States to explain decisions taken on water management including planning, requiring them to draft 'river-management plans';

(d) allows for far-reaching public scrutinizing of for example local authorities' plans to build dams etc.

2. The WFD

(i) The Framework Directive provides for the identification of European waters and their characteristics, on the basis of individual river basin districts, and the adoption of management plans and programmes of measures appropriate for each body of water. The EU, through the WFD, provides for the management of inland surface waters, groundwater, transitional waters and coastal waters for the purposes of preventing and reducing pollution, promoting sustainable water use, protecting the aquatic environment, improving the status of aquatic ecosystems and mitigating the effects of floods and droughts. The Directive contains a recital related to human rights which states "Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such". Another recital calls for public participation in decisions on plans and measures for river basin management. The Directive promotes the use of pricing and taxation as an incentive for consumers to use water resources in a more sustainable manner and to recover the cost of water services per sector of the economy. At the same time, the Directive also places a strong emphasis on cost recovery. Article 9 provides that EU countries shall take account of the principle of recovery of the costs of water services. This calls for economic analyses to be carried out to ensure adequate contributions by different classes of users, including households.

(ii) The following are some of the important terms used in the WFD:

- **Inland waters**: all standing or flowing water on the surface of the land, and all groundwater on the landward side of the baseline from which the breadth of territorial waters is measured.

- **Surface water**: inland waters, except groundwater, transitional waters and coastal waters, except in respect of chemical status, for which territorial waters are also included.

- **Groundwater**: all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

- Transitional waters: bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

- **Coastal water**: surface water on the landward side of a line every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.

- **River basin**: the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.

(iii) River basin district is the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwater and coastal waters. Article 3 of the WFD states that river basins extending across international borders should be assigned to international RBDs. The WFD encourages countries to cooperate in producing joint RBMPs for international RBDs. Since the first plans were to be ready in 2009, the forming of any joint plans would still be at its infant stages and it would be too early to determine its success. According to Article 5 of the WFD, Member States should have carried out characterizations with regard to the water resources analyses of all their RBDs and submitted reports to the European Commission in March 2005. This will enable joint characterization efforts taken by countries to be identified and used as an indicator of cooperation. It is understood that the EU has just completed its review of implementation and has issued a report end of 2009.

(iv) Under the WFD, EU Member States are expected to set up river basin districts and designate the administrative unit, usually the water councils, for each district. Both national and international districts should prepare management plans by 2009, and these provide a form of IWRM planning. The measures provided for in the river basin management plan seek to:

(a) **prevent deterioration**, enhance and restore bodies of surface water, achieve good chemical and ecological status of such water and reduce pollution from discharges and emissions of hazardous substances;

(b) **protect, enhance and restore** all bodies of groundwater, prevent the pollution and deterioration of groundwater, and ensure a balance between groundwater abstraction and replenishment;

(c) **preserve** protected areas.

The objectives are targeted to be achieved by 2015, but this deadline may be extended, albeit under the conditions laid down by the Directive.

(v) The Member States will encourage active involvement of all interested parties in river basin management plans for the implementation of this Directive. From the year 2010, Member States are required to ensure that water pricing policies provide adequate incentives for users to use water resources efficiently and that the various economic sectors contribute to the recovery of the costs of water services, including those relating to the environment and resources. Member States must also introduce arrangements to ensure that suitable and effective penalties are imposed in the event of breaches of the provisions of this Framework Directive. The WFD leaves wide avenues for Member States to have their individual approaches.

(vi) The Water Information System for Europe (WISE) was set up to enable public participation (citizens and citizen's group) which is crucial to achieving the objectives of the river management plan. WISE is a web portal from a collaborative effort between the European Environment Agency and the European Commission which provides the public with information on water and water-related topics. Information is already being loaded into the system by member States.

3. Related Directives

(i) Beside the Water Framework Directive 2000 as the central element in EU water legislation, there are other directives which form part of the European Union's policy on water and they are:

(a) Urban Waste Water Treatment Directive 91/271/EEC of 21 May 1991 concerning discharges of municipal and some industrial waste waters;

(b) Nitrates Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources of 12 December 1991;

(c) Drinking Water Directive 98/83/EC of 3 November 1998 concerning potable water quality;

(d) Bathing Water Directive 2006/7/EC of 15 February 2006;

(e) Protection of groundwater Directive 2006/118/EC of 12 December 2006;

(f) Flood Risks Directive 2007/60/EC of 23 October 2007.

The European Commission has also adopted a Marine Strategy Directive that would require the attainment of good status of the European Union's marine areas, following a similar approach to the Water Framework Directive.

4. Transboundary Rivers

(i) Under the Water Framework Directive, EU Member States should cooperate with neighbouring countries on shared river basins. The Danube provides the strongest example of this cooperation. The International Commission for the Protection of the Danube River acts as the umbrella body for the Directive's implementation across the

10 EU countries and 8 non-EU countries in the Danube river basin. The Danube River Protection Convention forms the overall legal instrument for co-operation on transboundary water management in the Danube River Basin. The Convention was signed on June 29 1994 by 11 of the Danube Riparian States, namely Austria, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, Moldova, Romania, Slovakia, Slovenia and Ukraine and the European Community. The Convention came into force in 1998. It aims to ensure that surface waters and groundwater within the Danube River Basin are managed and used sustainably and equitably. The efforts under the Convention involve:

- the conservation, improvement and rational use of surface waters and groundwater
- preventive measures to control hazards originating from accidents involving floods, ice or hazardous substances
- measures to reduce the pollution loads entering the Black Sea from sources in the Danube River Basin

All signatories to the Convention have agreed to co-operate on fundamental water management issues which includes taking all appropriate legal, administrative and technical measures to maintain and improve the current water quality and environmental conditions of the Danube River and of the waters in its catchment area as well as to prevent and reduce the adverse impacts and changes that may take place.

C. AUSTRALIA

1. Introduction

(i) The review of water resources management is seen in the context of river basin management in Australia, mainly focused on the Murray-Darling Basin which is the most significant and biggest Basin in the country. It would be necessary firstly to understand the main characteristics of the Basin before outlining the methods and strategies adopted in managing the Basin. The administrative framework will be briefly reviewed for these purposes.

2. The Murray-Darling Basin

(i) The Murray-Darling Basin which is located in the south eastern section of the continent covers an area of approximately one seventh of the land area of Australia. The area of the Basin mostly consists of extensive plains. The Basin provides almost three-quarters of all water used for domestic, industrial and agricultural purposes in Australia. Land in the Basin is used for a variety of purposes such as urban settlements, irrigated and dry land cropping, grazing of domestic stock, production forestry and conservation of natural areas in parks and reserves. The Murray and Darling Rivers runs a total length of some 3,780 km and is the fourth longest river

system in the world. The Basin is the catchment for the Murray and Darling Rivers and many of their tributaries. The Basin generates approximately 40 percent of the national income derived from agriculture and grazing. The Basin contains more than twenty major rivers as well as important groundwater systems. It is also an important source of fresh water for domestic consumption, agricultural production and industry.

(ii) The riverine environment of the Murray-Darling Basin supports a wide range of animal and plant communities, evidenced by the large number of wetlands (over 30,000) throughout the Basin. The wetlands are productive and biologically diverse ecosystems which provide essential breeding and feeding habitats for many species of water birds, fish, invertebrates and plants. Ten of these wetlands are listed as Ramsar Wetlands. The development of the Basin has caused many biophysical changes which have caused adverse impact on biodiversity threatening economic production for the future. The operation of the storage dams and the extraction of large volumes of water for consumption off-stream have also reduced the annual and seasonal variability which shaped the ecology of the region. Another problem faced is the extensive clearing of native vegetation outside the riverine corridors which has increased the volumes of rainwater leaking through the soil profile to groundwater systems. Serious salinity problems have also occurred. Such massive clearing has also reduced the habitat for many native plant and animal species.

(iii) Management of the Murray-Darling Basin requires the balancing of many values and assets that are potentially in competition. Like most other countries there is a tug of war between production-orientated activities of different economic interest and environmental needs. Australia has formulated a framework for political and administrative cooperation to help resolve these differences.

3. Organisation for Sustainable River Basin Management

(i) The Murray-Darling Basin consists of four territorial areas of New South Wales, Victoria, South Australia and Australian Capital Territory. The need to have coordination on the navigation of the river system and the sharing of water resources among the States led to the River Murray Waters Agreement in 1917. The River Murray Commission was established under the Agreement. The development that took place thereafter required improved coordination to manage other concerns and wider issues of resource management as well as broader role of the commission. As a result of this, the Murray-Darling Basin Agreement was executed in 1987 and the Murray-Darling Basin Ministerial Council was established.

(ii) The Murray-Darling Basin Agreement provides the framework for the integrated management of the Murray-Darling Basin. The purpose of the Agreement as provided in Clause 1 is to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of water, land and other environmental resources of the Murray-Darling Basin. This Agreement was signed by the governments of the Commonwealth, New South Wales, Victoria and South Australia in 1987. The Agreement is the amended version of the initial form of the River Murray Waters Agreement. Five years later, the River Murray Waters

Agreement was replaced by a totally new Murray-Darling Basin Agreement in1992. The new Agreement was given full legal status by the Murray-Darling Basin Act 1993 passed by all the contracting governments. Subsequently Queensland became a signatory too in 1996 and in 1998, the Australian Capital Territory (ACT) executed a Memorandum of Understanding to formalise its participation in the Agreement. The signatory governments ratified the Agreement through identical legislation enacted by their respective State legislatures.

(iii) New institutions at the political, bureaucratic and community levels were established under the Agreement to buttress its implementation. The Murray-Darling Basin Ministerial Council, the Murray-Darling Basin Commission and the Community Advisory Committee were formed in this regard. The objectives, functions and composition of these institutions as well as the procedures for natural resource management, water distribution, asset management and financial disbursements are set out in the Agreement. The Murray-Darling Basin Ministerial Council is the primary body that is responsible for providing the policy and direction required to implement the Murray-Darling Basin Initiative. The Ministerial Council consists of Ministers responsible for land, water and environmental resources within the Contracting Governments, with a maximum of 3 Ministers from each government. The chairperson of the Community Advisory Committee also attends all Council meetings. The Council meets at least once a year. The primary functions of the Ministerial Council as specified in clause 9 the Murray-Darling Basin Agreement, are:

(a) generally to consider and determine major policy issues of common interest to the Contracting Governments concerning effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin; and

(c) to develop, consider and, where appropriate, to authorise measures for the equitable, efficient and sustainable use of such water, land and other environmental resources.

The Ministerial Council, which is a political forum, has the power to make decisions for the Basin as a whole. Resolutions of the Council require a unanimous vote. This means that decisions taken by the Council represent a consensus of governmental opinion and policy across the Basin.

(iv) The Community Advisory Committee (CAC) of the Murray-Darling Basin Ministerial Council takes on an advisory role to the Ministerial Council from the community viewpoint on key natural resource management including indigenous issues within the Basin. The CAC consists of formally appointed group of experts with wide range of networks throughout the Basin. The CAC has 22 members with an independent Chairman. Members are appointed for a term of four years and are selected on the basis of their skills, expertise and networks. The terms of reference of the CAC are to:

(a) advise the Ministerial Council on natural resource management and on the views of Basin communities related thereto;

(b) assist the Murray-Darling Basin Initiative;

(c) participate, on the Ministerial Council's direction, in Basin community engagement programs and advice the Ministerial Council on the effectiveness of the programs; and

(d) participate as directed by the Ministerial Council, in policy development processes of the Commission and Ministerial Council.

The CAC meets four times a year and holds periodical joint meetings or workshops with the Commission. The CAC is supported by a secretariat based at the office of the Murray-Darling Basin Commission.

(v) The Commission is the executive arm of the Ministerial Council. It is responsible for managing the designated river and lake system and advising the Council on matters related to the use of water, land and other environmental resources of the Murray-Darling Basin. The Commission is not a government department or a statutory body but is an autonomous organisation equally responsible to the governments represented on the Ministerial Council as well as to the Council itself. The main functions of the Commission, specified in clause 17 of the Murray-Darling Basin Agreement are as follows:

(a) to advise the Ministerial Council in relation to the planning, development and management of the Basin's natural resources;

(b) to assist Council in developing measures for the equitable, efficient and sustainable use of the Basin's natural resources;

(c) to coordinate the implementation of, or where directed by Council to implement, those measures; and

(d) to give effect to any policy or decision of the Ministerial Council.

The Commission also carries out works and measures at the direction of the Ministerial Council, and coordinates the efforts of the government partners in line with the Murray-Darling Basin Initiative. It holds the mandate to initiate, support and evaluate integrated natural resources management across the Murray-Darling Basin. The Commission comprises an independent President, two Commissioners from each Contracting Government and a representative of the Australian Commenwealth Government. The Commissioners are normally chief executives and senior executives of the agencies responsible for management of land, water and environmental resources. The chairperson of the CAC also attends all Commission meetings. The Commission meets at least four times a year.

(vi) The Commission cooperates with partner governments, committees and community groups to develop and implement policies and programs aimed at the integrated management of the Murray-Darling catchment and managing and distributing the water of the River Murray in accordance with the Murray-Darling Basin Agreement. This approach shows the importance of Government-community partnerships which results in participants and end-users to enjoy the benefits of shared concerns and expertise, jointly developed and integrated solutions, and avoids duplication of effort.

4. Water Act 2007

(i) A new law was passed known as the Water Act 2007 which commenced on 3rd March 2008. This Act will enable water resources in the Murray-Darling Basin to be managed in the national interest, optimising environmental, economic and social outcomes. It is not clear at this juncture as to the impact this law will have on the existing institutional framework nor how operations may change. There are 5 key elements of the Act and they are explained briefly below:

(a) **Murray-Darling Basin Authority**

Under the Act an independent Murray-Darling Basin Authority is established. The Authority is equipped with the functions and powers which includes enforcement powers to ensure that Basin water resources are managed in an integrated and sustainable way. The main functions of the Authority include:

- preparing a Basin Plan for adoption by the Minister, including setting sustainable limits on water that can be taken from surface and groundwater systems across the Basin;
- advising the Minister on the accreditation of state water resource plans;
- developing a water rights information service which facilitates water trading across the Murray-Darling Basin;
- measuring and monitoring water resources in the Basin;
- gathering information and undertaking research; and
- engaging the community in the management of the Basin's resources.

The Authority reports to the Commonwealth Minister for Climate Change and Water and will comprise a full-time Chair and four part-time members. The Authority members shall be persons with significant relevant expertise, such as in fields of water resource management, hydrology, freshwater ecology,

resource economics, irrigated agriculture, public sector governance and financial management.

(b) **Commonwealth Environmental Water Holder**

The Act establishes a Commonwealth Environmental Water Holder to manage the Commonwealth's environmental water to protect and restore the environmental assets of the Murray-Darling Basin and outside the Basin where the Commonwealth owns water. In the Murray-Darling Basin, these holdings will be managed consistent with the Environmental Watering Plan that will be developed by the Authority in consultation with state governments and stakeholders. The Murray-Darling Basin Authority will coordinate its activities with other holders of environmental water in the Basin.

(c) **Australian Competition and Consumer Commission (ACCC)**

The ACCC will play a key role in developing and enforcing water charges and water market rules in accordance with the National Water Initiative. The aim is to ensure that water markets are able to operate freely across state boundaries and that perverse outcomes from inconsistent water charging arrangements are avoided. The ACCC will advice the Commonwealth on water charges and market rules to apply within the Murray-Darling Basin and will be responsible for enforcing these rules. It will also determine the bulk water charges.

(d) **The Basin Plan**

The Basic Plan is the strategic plan required by the Act to be created by the Authority for the integrated and sustainable management of water resources in the Murray-Darling Basin. This plan is referred to as the Basin Plan.

(e) **Bureau of Meteorology**

The Bureau of Meteorology is responsible to collect and publish high-quality water information under the Act, in addition to its existing functions under the **Meteorology Act 1955**. The publications include a National Water Account and periodic reports on water resource use and availability. The Bureau will also be empowered to set and implement national standards for water information. A major outcome of the Bureau's work will be increased transparency, confidence and understanding of water information.

5. Australia and International Partnership on Water

(i) WaterAid Australia is an international charity dedicated to helping some of the world's poorest people escape the stranglehold of poverty and disease caused by living without safe water and sanitation. WaterAid Australia's vision is of a world where everyone has access to safe water and sanitation.

"Making every drop count:Water and Australia Aid" is Australia's aid program's water policy to guide water related assistance within the Australian overseas aid program. The objective of this program is to assist the region's water challenges. WaterAid and its partners work with individuals and families in their communities and use a mixture of low-cost technologies to deliver lasting water, sanitation and hygiene solutions.

This organization outlines the Government's strategy to assist developing country partners in the sustainable management and development of water resources and services. The focus is on water governance and service delivery, emphasising the application of Australian knowledge and expertise to water challenges in the Asia Pacific region.

(b) The Australian Water Research Facility (AWRF) was instituted in March 2003 to work towards this objective. The University of Sydney was engaged by AusAID to investigate the complexities and dynamic aspects of water regulatory systems in Indonesia, Vanuatu, Thailand, Vietnam and the Mekong region

D. THAILAND

1. Introduction

(i) Water carries social significance in Thailand. Water has been an important part of the life in Thailand and very closely related to the people of Thailand. The Songkran celebration is an important water festival. Thailand can be divided into 25 river basins.

(ii) According to a report entitled "Thailand's Water Vision: A Case Study", in the 19th century water was viewed as belonging to the King, who distributed it on a need basis through a government agency, hence the name Royal Irrigation Department. Thailand started its water management effort through irrigation canals (example, the Rangsit canal network) for agriculture and transportation. Later it expanded to reservoirs including dams and large water management projects such as the Bhumipol Dam and Hydropower Plant across the Ping River. By the early 20th century, there were a few government agencies involved in water management in Thailand. Principally, the task was left to the Royal Irrigation Department and the Electricity Generating Authority of Thailand. The people participated in water management efforts and these early attempts at taking a participatory approach toward water management continued into the 1990s, laying the foundation for the landmark Integrated Water Resources Management program that Thailand enjoys today.

1 This Report is based on a presentation done by Mr. Surapol Pattanee, Department of Water Resources, Ministry of Natural Resources and Environment, at a workshop on "Effective Integrated Water Resources Management Implementation in a River Basin for River Basin Organizations", 27 -31 July 09, Bangkok, Thailand.

(iii) Today, Thailand is known to have a dynamic program of Integrated Water Resources Management and has established itself as a leader in water resources management, offering other countries in the region useful examples of water policy and procedures. Thailand, like many Asian countries, faces increasing population, economic, agricultural and industrial expansion. Its major water sources include surface water, ground water and sea water. High loading of pollutants from human activities is contributing to degradation of water quality in the country.

2. National Water Vision and Policy

(i) The National Water Vision of Thailand is that by the year 2025, Thailand will have ufficient water of good quality for all users through an efficient management, organizational and legal system that would ensure equitable and sustainable utilization of its water resources with due consideration for the quality of life and participation of all stakeholders.

(ii) The National Water Policy of Thailand comprises the following:

(a) Accelerate promulgation of Water law as the framework for national water management;

(b) Create water management organizations both at national and river basin levels with supportive legislation;

(c) Emphasize suitable and equitable water allocation for all water use sectors;

(d) Formulate clear directions for raw water provision and water sources development;

(e) Provide and develop raw water sources for agriculture purposes;

(f) Develop and include water related topics at all levels of educational curriculum;

(g) Promote and support participation of the public, non-government and government organizations;

(h) Accelerate preparation of plans for flood and drought protections; and

(i) Provide sufficient and sustainable financial support for action programs in line with the national policy.

3. Legislative Framework

Legislation	Regulated Activities	Responsibility Ministries	Remarks
Enhancement and Conservation of National Quality Act (NEQP 1992)	Regulates specified point sources for wastewater discharges into public water resources, or the environment, based on effluent standards	Ministry of Natural Resources and Environment	Key environmental legislation;
Factories Act of 1992	Limits level of effluent discharged and restricts concentration levels of chemical and/or metal pollutants	Ministry of Industry	Ministry of Industry also promotes industrial development activities which creates conflicts of interest. An amendment to the Act is being drafted to require pollutants to pay for clean-up costs.
Navigation in Thai Waterways Act (Volume 14) as amended in 1992	Prohibits dumping of any refuse including oil and chemicals into rivers, canals, lakes or waterways that may pollute the environment or disrupt navigation in Thai waterways	Ministry of Transport	Many cases have been successfully brought against polluters
Publics Health Act of 1992	Regulates nuisance activities related to water pollution such as odour, chemical fumes, wastewater discharge system of buildings, factories or animal feedlots that cause harmful health effects	Ministry of Public Health	Decentralized implementation to Local Government Authorities
Canal Maintenance	Prohibits dumping or discharging of wastewater in canals	Ministry of Agriculture and Cooperative	Little used
Building Control Act of 1979	Regulates discharges of water pollution from building	Ministry of Interior	Decentralized implementation to Local Government Authorities
Fisheries Act of 1947	Prohibits dumping or discharging of hazardous chemicals into water resources reserved for fishing	Ministry of Agriculture and Cooperative	Difficult to prove intention for criminal liability
Royal Irrigation Act of 1942	Prohibits dumping of garbage or discharging polluted water or chemicals into irrigation canals	Ministry of Agriculture and Cooperative	Limited jurisdiction

Source: **Water Environment Partnership in Asia (WEPA)**

(i) Thailand is currently challenged with many sectoral laws with no single law addressing IWRM in its entirety. Thailand has developed a 20 year Policy and Prospective Plan for Enhancement and Conservation of National Environment Quality (1997-2016) which establishes goals, principles, and policies and guidelines for environmental quality management. The Prospective Plan recognizes the role of local government authorities and NGOs in improving and protecting water quality by increasing awareness and monitoring.

(ii) Thailand's Draft Water Law is now at its final stage of passing into law. The law seeks to ensure that the basic rights to access to water for domestic use of the people are well protected. Under this law the National Water Resources Committee and the River Basin Committees shall be established as formal organizations. The Chairman of the NWRC shall be the Prime Minister with the Secretariat from the National Department of Water Resources. It shall comprise of experts from relevant ministries including experts from private sector. The NWRC shall formulate policy, financial and implementation plans for approval by the Cabinet. It shall set criteria and guidelines for river basin and water resources management, coordinate, support, accelerate and monitor the implementation of River Basin Committees, set priority and control the demand of water allocation and monitor and evaluate water resource activities which are transferred to local/provincial organizations.

E. BRAZIL

1. Introduction

(i) Brazil is a South American Federal Republic and known to be rich in water resources, recording 13% of the world's surface water resources. Brazil also has substantial and significant natural resources, fresh water bodies and biodiversity. However, even though Brazil has more than enough water resources, supply of such water to the users posed serious problems leading to a review and overhaul of policies and approaches to water resources management. For example a serious lack of water storage in dams led to a national crisis in the supply and distribution of electricity. It further illustrated the need for IWRM and leadership by the Federal Government. IWRM in Brazil is an evolving process that begun in the early 1900's and it will continue to do so as external factors continue to change and impact the manner in which water resources are governed in the country.

(ii) The Brazilian government comprises of the Union, 27 States, Districts and Municipalities. The 1988 Constitution allocated responsibility over water along almost similar lines as the Malaysian Constitution i.e. all water resources within a state was a state right. The Federal Government may make laws only on water resources that occurred in more than one state. The Constitution enabled each of the levels of governance to individually and concurrently make its own policies, operating criteria and legislation on matters of conservation, soil and natural resources management, environmental protection and pollution control. The first legislation in water resources in Brazil was the Water Code 1934. This Law was largely concerned with the utilization of water to generate energy and did not address other aspects of IWRM. Following a more comprehensive review of the management of water resources a national policy and national law was enacted in 1997. The National Water Agency of Brazil (**ANA**) was also established in 2000 to spearhead the implementation of the National Water Resources Policy (**NWRP**) and National Water Resources Management System (**NWRMS**).

2 This Review is based on Reports produced by ANA – The Evolution Of Water Resources Management In Brazil, Brasilia, August 2002, March 2002 and October 2005.

2. Water Legislation

(i) The division of responsibilities between Federal and State authorities as provided for in the Constitution led to an impasse in the implementation of the NWRP and NWRMS. The President of Brazil created ANA in order to better coordinate and complement water management actions by the combined administration of the Union and State governments in regard to Brazil's water basins. ANA is seen as an effective executive-regulatory agency which implements the NWRP and manages and coordinates the NWRMS. ANA also funds and controls water bodies in the federal domain. ANA addresses major water problems, strategic river basin management planning and introduced Integration Agreements for coordinated management. The integration and coordination effort is undertaken through bodies established including the National Water Resources Council, State Water Resources Councils, Basin Committees, Water Agencies which comprise of representation from federal, state and municipal groups who are involved in water resources management. ANA has successfully implemented practical solutions and strengthened good governance within a strategic water management framework of goals, policies and planned actions. The role of ANA also includes arbitrating conflicts among water users. States derive support from the Federal Government through ANA to better manage their water resources and to implement IWRM. The management process in Brazil allows for the involvement of and contribution from all affected parties including the private sector, community groups and disadvantaged stakeholders. ANA successfully arbitrated and resolved the electricity crises in 2001.

(ii) Brazil bolstered IWRM with the promulgation of Law No. 9433, 1997. The primary objective of the Law was to provide for interpretation of the Constitution and provide for the implementation of NWRP and NWRMS. The Law sets out the primary objectives of the NWRP and NWRMS and sets out action guidelines for implementation. The Law requires Water Resources Plans to be drawn up with defined minimum content of such Plans including determination of the guidelines and criteria for charging fees for the use of water resources. The Law3 generally provides for the following:

a) implementation of the NWRP including classification of water bodies, usage rights, charging of fees and the setting up of a water resources information system;

b) drawing of the water resources plans comprising of master plans for the implementation of the NWRP;

3 ANA, National Water Policy, Law No. 9433 dated January 8, 1997, Http://www.ana.gov.br/ingles/waterPolicy.asp.

c) classification of water bodies into various categories based on prevailing use of water from that body to ensure that water quality is maintained for the use that it is intended and to prevent escalating costs of prevention of water pollution;

d) governing the regulation and control of water resources allocation for usage to ensure quantitative and qualitative control over water uses;

e) charging fees for the use of water resources acknowledging water as an economic asset to encourage more rational usage of water resources and to fund programs under the Water Resources Master Plan;

f) the setting up and operations of a Water Resources Information System to drive the better implementation of the NWRP and NWRMS. The system shall be decentralised with unified coordination and with access to data and information assured to society as a whole;

g) Empowering the Federal Authority to take appropriate steps to implement the NWRP and NWRMS, implement and operate the Water Resources Information Management System (WRIMS) at the National level and foster integration of water resources management with environmental management.

h) Empowering the State Authorities to be responsible, within their sphere of jurisdiction, to award water usage rights, maintain control over water supply, implement the WRIMS at the State level and foster integration of water resources management with environmental management;

i) Establishment of the National Water Resources Council, State Water Resources Councils, River Basin Committees and State Water Agencies as integral part of the NWRMS. The role of each of these agencies are defined in the Law;

j) Provides for the imposition of penalties and fines including preventive actions where necessary such as embargoes, orders to rectify irregularities, and punitive fines based on damage caused.

(iii) There is increased awareness in Brazil with regard to water as an irreplaceable source of wealth. The establishments of government institutions and legal mechanisms has taken place in Brazil. Public participation is encouraged by legislation in Brazil. Brazil has acknowledged that it requires a huge capacity building program to mobilize institutions and the society to ensure successful implementation of the National Water Resources Management System.

Annex 3.5 – Framework of Proposed Legislation for IWRM

ANNEX 3.5 - FRAMEWORK OF PROPOSED LEGISLATION FOR IWRM

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FRAMEWORK OF PROPOSED LEGISLATION FOR IWRM

1. OBJECTIVES

(i) The objectives of the Act maybe stated to be as follows:

- to support the sustainable use and conservation of water resources in Malaysia through the introduction of IWRM principles, methodology and practices;
- to review and update the Waters Act 1920;
- to promote uniformity of law and policy in the management of water resources throughout the country in accordance with Article 76 of the Constitution;
- to enable the regulation and control of matters pertaining to the management of interstate and international transboundary water resources; and
- to confer executive authority on the Federal and State Governments on certain matters consistent with the provisions of Articles 74, 80, 81, 92, 93 and 94 of the Federal Constitution.

2. APPLICATION OF THE ACT

(i) The Act shall, subject to paragraphs 2.2 and 2.3 below, apply to Malaysia with power to the Minister (NRE) to determine different dates for the enforcement of different parts or sections. The Act shall apply to all Federal Territories on a date to be determined by the Minister.

(ii) The Act shall not come into force in any State (other than the Federal Territories) unless first adopted by the State Legislature. The State shall have the discretion to adopt fully or with amendments to the Act. In adopting the Act, the State shall not change or amend those sections which deal with Federal powers.

(iii) The Act may not apply to Sabah and Sarawak but there will be nothing to prevent the latter States from adopting and implementing relevant parts of the Act.

(iv) The Act shall apply to surface and sub-surface water resources occurring across terrestrial and coastal areas (up to 3 nautical miles).

(v) The Act must give due consideration to avoid duplication and conflict with other relevant legislation in particular the WSIA, SPAN, NLC, EQA, Forestry, Geological Survey Act, TCPA and LGA.

(vi) The Act must give due consideration to and be guided by the provisions of existing State Enactments on water resources.

3. INTERPRETATION

(i) The Act shall contain basic definitions of critical terms including the following:

a) water resources

b) Integrated Water Resources Management

c) Integrated River Basin and Lake Basin Management

d) Ground water

e) Coastal waters and coastal area

f) Wetlands

g) Inland waters including lakes

h) Sustainable use.

4. THE NATIONAL WATER RESOURCES COUNCIL

(i) The Act should formalise the current set up of the National Water Resources Council (NWRC) with membership, roles and functions clearly defined by law (and as recommended by the Institutional Review of the NWRS Study).

(ii) The primary role of the Council shall generally be to provide an avenue for consultation and coordination among various stakeholders and in particular between Federal and State Governments. It shall be vested with powers to consider, adopt and make recommendations on national policies, plans and programs (PPP) and give direction to the NRE, National Water Resources Department (NWRD) and other related bodies on matters pertaining to IWRM. The membership of the Council shall remain similar to current status. The decisions of the Council shall be implemented by all stakeholders.

(iii) The NWRC shall be the apex body for the consideration and adoption of the National Water Resources Policy (NWRP), monitor its implementation and undertake periodic reviews of the Policy.

(iv) The NWRC shall consider issues related to inter-state and transboundary IWRM matters. It shall deliberate, provide advice and, where mandated, make policy decisions on issues pertaining to the management of interstate and international transboundary catchments, water resources and aquifers. It shall advise the State and Federal Governments on the transfer and sale of water between states and to other countries.

(v) The NWRC shall adopt a national program for research and development on water resources and empower the NWRD to implement this program.

5. POLICY AND ADMINISTRATION

(i) The Act shall provide for the designation and establishment of a National Water Resources Department (NWRD) to generally address all issues pertaining to water resources at the national level. The Director General of NWRD shall be vested with powers, duties and responsibility on all matters related to the sustainable management, conservation and use of water resources within the country. The NWRD will also provide advice and support to the NWRC.

(ii) The Agency shall be a Department with adequate expertise and capacity to undertake these programs. The Agency should have capability to provide services not only at the Federal level but at the state and local level. The exact powers, functions and duties shall be as recommended by the Institutional Review of the NWRS Study.

(iii) The primary role of the NWRD shall be to formulate, assist, coordinate and ensure the implementation of the National Water Resources Policy (NWRP) as mandated by the NWRC and related national policies. The NWRD will perform the functions and duties that is assigned to the Federal Government under the Constitution other than those which are already assigned to other Federal Agencies by relevant laws.

(iv) In particular the NWRD will absorb and perform all of the current functions of the DID at the Federal level.

(v) The Act may provide for the delegation of powers vested in the NWRD to State and local authorities and to other agencies which may already be engaged in specific functions related to IWRM/IRBM.

(vi) The formation of appropriate State level agencies for the implementation of National and State level PPP's will also be provided for. This will include the establishment of a State Water Resources Council (SWRC), State Water Resources Agency (SWRA) and appropriate Water Resources Technical Committees at the River Basin and District levels. Key stakeholders will be incorporated at all levels of decision making. It shall be the duty of the SWRC to align the State's PPP's in line with the relevant national policies.

(vii) It is expected that due consideration will be given by every state (particularly in those States which do not have a dedicated water resources agency) to designate the State DID as the State Water Resources Agency.

6. POWERS AND RESPONSIBILITIES OF THE NWRD

(i) The NWRD shall draw up and implement national PPP's for the nation. It will support the Ministry of Natural Resources and Environment in the formulation and implementation of national policy on water resources.

(ii) The NWRD shall implement the National Water Resources Policy (NWRP). It shall provide advice to a State on issues related to IWRM and the State may take appropriate action to implement such advice. The Act should empower the State Authorities to ensure that, upon such notification or advice by the Agency, they will take appropriate action. It shall require the parties concerned to consult and adopt agreed measures to implement PPP's for IWRM.

(iii) It will assist the NWRC/NRE in determining national priorities for water allocation and use for all sectors in normal as well as during times of drought.

(iv) It will assist the NRE with the provision of expertise and opinions for national participation at international forums on water resources. In carrying out its duties and functions, the NWRD will take into consideration the provisions of various international conventions, agreements and obligations of the Nation that impact on water resources.

(v) The Department shall also monitor the implementation of the various PPP's adopted by the various stakeholders and perform auditing of the state of the nations water resources including its availability, sustainable use and conservation. The issue of shared water resources between two or more states, particularly if there is a dispute between such states, shall fall within the jurisdiction of the NWRD.

(vi) The Department will build capacity, enable training and generally support the implementation of IWRM at all levels of governance. The NWRD shall build capacity and provide financial support to any State which undertakes the implementation of appropriate PPP's in accordance with the advice provided by the Agency.

(vii) The Act shall enable the NWRD to play the role of a regulatory/advisory body to enable it to prescribe the technical details of IWRM for every State.

(viii) The NWRD should have the powers to deal with any emergency or take urgent action to deal with any issue including the power to direct any agency to undertake any action to resolve the emergency.

7. POWERS AND RESPONSIBILITIES OF THE STATE

(i) The Act should determine the powers, duties and responsibilities of the State authorities.

(ii) The State shall establish or identify an appropriate policy making body such as the State Water Resources Council (SWRC) to be chaired at the highest level.

(iii) The State may implement the decisions of the NWRC including the national PPP's with the assistance and advice of the NWRD.

(iv) The State shall set up an appropriate technical agency as the State Water Resources Agency to undertake the implementation of IWRM in the State. The State may also identify/designate an existing agency (the DID) as the State Water Resources Agency.

(v) The Act will also provide for the integrated management and sustainable use of water resources in the State. The Act will empower the State Government to undertake the formulation and implementation of PPP's for IWRM within their respective states.

(vi) The State Water Resources Agency (SWRA) shall assist the SWRC in determining state level priorities for water allocation and use for all sectors in normal as well as during times of drought.

(vii) The SWRA shall also undertake implementation of the various PPP's adopted by the SWRC, monitor actions by various stakeholders and audit the state of water resources including its availability, sustainable use and conservation within the State.

(viii) The State may also consult the NWRD on issues related to IWRM. It shall endeavour to comply with any technical advice, standards, directions, orders and appropriate guidance issued by the Agency for the implementation of national policies, national interest and related international obligations. The SWRA will assist and cooperate with the NWRD and undertake to implement the National Policy on Water Resources.

(ix) State governments may voluntarily consult the NWRD prior to the use of or adoption of actions that will impact on water resources in the State. Such voluntary acts shall be "rewarded" with appropriate incentives such as appropriate funding, waiver of fees and charges.

(x) The State shall amicably settle the issue of shared water resources between two or more states. In the event of a dispute it shall refer the matter to the NWRD/NWRC for a speedy resolution.

(xi) The SWRA will collect, compile and publish critical data on water resources in the State. It will make available to the NWRD any information required by the latter for national purposes.

(xii) The SWRA will enable, encourage and coordinate scientific research and development into critical areas of IWRM within the State. It will cooperate with the NWRD in determining priority areas for scientific research.

(xiii) The State may make rules for the implementation of IWRM within the State as contained in the Act.

(xiv) The State has a duty to create public awareness and education and to encourage stakeholder participation.

8. WATER RESOURCES FUND

(i) The SWRC shall set up and administer a Water Resources Fund with the primary objective of supporting IWRM in the State. The Fund may comprise of allocations/grants/loans made by the Federal/State Governments, revenue generated by any activity which is regulated by the SWRC, loans obtained from approved sources and grants/donations made by related parties.

(ii) The Fund shall be used by the SWRC to finance its activities including the implementation of all its policies, plans and programs. It shall also be used by the SWRA to fund PPP's approved by the SWRC.

(iii) The Fund may be used to provide incentives/disincentives for the adoption of IWRM practices and water resources conservation at the various levels of governance.

(iv) The Legislation should enable the State (with assistance from the Federal authorities) to identify and establish sources of revenue for all parties. Shared revenues shall be distributed equitably among all stakeholders.

(v) The law may contain provisions to ensure that there is equitable sharing of costs and benefits arising from the conservation of water resources by States and Federal Government.

9. PROTECTION AND DEVELOPMENT OF WATER RESOURCES

(i) The Act shall determine that the State shall be the authority responsible for the control and regulation of all water resources within the state. No person may extract, divert, discharge, pollute or carry out any works in any water resource or its catchment without the written permission of the state.

(ii) The NWRD may, on shared waters/catchment areas between two or more states, mediate and or become party to agreements on the management and sustainable use of the shared water resource.

(iii) In the event the management, use or control of a water resource impacts upon international relations with foreign governments, the Act shall enable the NWRD in consultation with the relevant state government to mediate and conclude agreements with the said foreign government.

(iv) The Act shall provide for the declaration, protection and conservation of water catchment areas, hazard prone areas, buffer zones and reserves (including river reserves) by the relevant state authorities. The NWRD shall set national standards and guidelines for the declaration, protection, conservation and sustainable use of such areas.

(v) The Act shall enable the NWRD in consultation with the State to jointly take action on the prevention, control and regulation of water hazards including integrated flood prevention and management, climate change, coastal erosion and stormwater management.

(vi) The Act shall, whilst taking into account the provisions of the Environmental Quality Act, contain adequate provisions which will enable the NWRD and State to take action to conserve and maintain the quality of water within any water source.

(vii) The NWRD may, based upon independent research and findings, request a State to declare any area to be a water catchment area, hazard prone area, buffer zone and reserve (including river reserves) for national purposes. The Agency shall assist the State in the control and regulation of the conservation and sustainable use of water resources from this area including through appropriate research and development, provision of appropriate incentives and funding, capacity building and other means of empowerment including compensation (for "loss of rights" to resources) to the State.

(viii) The NWRD shall coordinate and direct independent scientific research into IWRM and it shall be a clearing house for research proposals and activities.

(ix) Similarly the Act shall enable the SWRA to collect, compile and disseminate data on water resources within the State. The SWRA shall also cooperate with the NWRD on the sharing of data for national purposes and coordinate with it on scientific research into IWRM.

(x) The NWRD shall conduct comprehensive audits of water resources in every state, undertake a national census of water resources periodically, evaluate IWRM practices in the country against internationally accepted benchmarks and produce periodic reports on the status of water resources in the Country.

(xi) The NWRD shall periodically, report and provide advice to the NWRC, Federal and State Governments on the status of water resources in the country.

10. REGULATIONS

(i) The Act shall provide for the making of regulations to enable the control and regulation of various detailed technical and operational matters. Regulations will also be necessary to ensure uniformity of approach by various stakeholders, adoption of common standards and implementation of cross sectoral national considerations.

(ii) The NWRD and the SWRC may make regulations on matters within their respective purview. The NWRD may also make model regulations which may then be adopted and implemented by all State Governments.

(iii) The Act may, inter alia, provide for regulations to be made by the NWRD or the State Authority. The following regulations may be made:

(a) **By the NWRD:**

(1) the establishment and maintenance of a national register of water resources;

(2) the sustainable management, regulation and control of water resources and their catchments particularly interstate and international transboundary resources and aquifers;

(3) the measurement, classification, determination and maintenance of standards on the quantity, quality or other characteristics of water resources;

(4) the categorisation of priorities and rights to water resources on a national basis including taking into account international commitments and obligations;

(5) the interstate/international sale and transfer of water resources;

(6) national standards and requirements for recycling of water;

(7) measures to regulate and control stormwater drainage and to minimise the impact of climate change;

(8) national standards for the determination and maintenance of adequate or minimum acceptable flows of water in water sources;

(9) national standards and requirements for the planning, design, construction, management, operation and maintenance of works (such as dams, drainage works, irrigation works, etc) in designated areas;

(10) the identification of problem soil areas and determination of appropriate measures to manage such areas;

(11) formation, operation and management of stakeholder groups;

(12) identifying and recommending measures for the control and regulation of water quality within water sources (other than those aspects regulated by the EQA);

(13) establishing general standards for measurement of performance and KPI's;

(14) the submission of reports, accounts, data, statistics and other information;

(15) the methods and procedures for the determination of appeals and disputes and the holding of inquiries or arbitration;

(16) the safety of dams;

(17) the protection of the safety and health of the public from disasters and hazards including emergency powers to abate and mitigate any danger or nuisance to public health and safety;

(18) the payments, costs and other sums charged for any matter or thing required or authorised to be done under this Act or regulations made there under;

(19) rules and guidelines for the declaration of an area by a State as a water catchment area, hazard prone area, buffer zone and reserve (including river reserves) particularly for areas which fall across state or international boundaries;

(20) the prescribing of offences which may be compounded and the procedure for the compounding of such offences; and

(21) requirement for data to be made available to the Agency, rights to data collection, collation, publication and updating and availability in the public domain.

(b) **By the State Authority:**

(1) the establishment and maintenance of a State register of water resources;

(2) the sustainable management, regulation and control of water resources;

(3) the adoption and implementation of national standards on the quantity, quality or other characteristics of water, any water source and related resources;

(4) the categorisation of priorities and rights to water resources, taking into account the national rules;

(5) the interstate/international sale and transfer of water resources;

(6) adoption and implementation of national standards and requirements for recycling of water;

(7) adoption and implementation of measures to regulate and control stormwater drainage and to minimise the impact of climate change;

(8) adoption and implementation of the national standards for the maintenance of adequate or minimum acceptable flows of water in water sources;

(9) adoption and implementation of the national standards and requirements for the planning, design, construction, management, operation and maintenance of works (such as dams, drainage works, irrigation works, etc) in designated areas;

(10) declaration of problem soil areas and measures to manage such areas;

(11) establishment and recognition of stakeholder groups;

(12) preventing, mitigating, remedying and regulating any activity that impacts on the quality, safety and security of water sources;

(13) adopting and implementing national performance standards and KPI's;

(14) the submission of reports, accounts, data, statistics and other information to the relevant authorities including the NWRD;

(15) the methods and procedures for the determination of appeals and disputes and the holding of inquiries or arbitration;

(16) adoption and implementation of measures for the safety of dams;

(17) adoption and implementation of measures for the safety and health of the public from disasters and hazards;

(18) prescribing conditions, standards and requirements for undertaking any activity including navigation, fishing or recreational activities on a water resource and its catchment;

(19) the payments, costs and other sums charged for any matter or thing required or authorised to be done under this Act or regulations made there under;

(20) adoption and implementation of national standards, classification, lists and specifications related to all aspects of IWRM;

(21) declaration of any area as a water catchment area, hazard prone area, buffer zone and reserve (including river reserves) including rules and guidelines for the control of any activity or action within such an areas;

(22) the requirement for licences, its form, conditions and contents including the manner of renewals and fees to be paid;

(23) the prescribing of offences which may be compounded and the procedure for the compounding of such offences; and

(24) requirement for data to be made available to the State Authorities and NWRD, rights to data collection, collation, publication and updating and availability in the public domain.

11. ENFORCEMENT

(i) There needs to be clear responsibility for enforcement. The SWRA shall, within its State, be the enforcement body. The NWRD shall assist and provide advice on the enforcement to be carried out by this Agency including capacity building to undertake this task.

(ii) Elements of self regulation should be incorporated in the legislation. Private companies shall practice self regulation. Independent audit firms may be appointed to undertake environmental and ecosystems auditing.

(iii) The management of water resources will involve many stakeholders right down to the local level. District and local authorities should be empowered to participate and administer water resources.

12. PENALTIES

(i) Penalties should be set at a meaningful level and may include imprisonment and fines. It could also include stop work orders, prohibition of entry or exit, detention and or the temporary suspension of works/services. Penalties would result from prosecution under the Act or Regulations.

(ii) Penalties should apply to individuals, companies and its managers/directors.

13. TRANSITION AND REPEALS

(i) The Act will enable the relevant State Governments (where the Waters Act 1920 has been adopted) to repeal and replace the State Waters Enactment with this new Act.

(ii) The Act will provide for the transition of any actions or claims commenced under the Waters Act or State Enactment until declared otherwise by the authorities.

(iii) The provisions of this Act shall have minimal or no effect on current State water resources enactments. States may however, if they deem it necessary, take appropriate steps to review, update and amend their enactments, to ensure consistency and uniformity with the new Act. It is expected that all states will

eventually migrate to the new Act by adopting it in total. The NWRD shall assist all states in this matter.

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
AUGUST 2011

Annex 3.6 – Draft of the NWRL

THE NATIONAL WATER RESOURCES ACT 201...

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THE NATIONAL WATER RESOURCES ACT 201...

An Act to provide for the integrated management of water resources in Malaysia and for matters connected therewith.

WHEREAS the conservation and sustainable use of water resources is critical to the development, safety and security of Malaysia;

AND WHEREAS it is expedient, for the purpose of ensuring uniformity, to make a law for the integrated management of water resources in Malaysia;

NOW THEREFORE pursuant to Clause (1) of Article 74 and Clause 1(a) and 1(b) of Article 76 of the Federal Constitution, **IT IS ENACTED** by the Parliament of Malaysia as follows:

PART 1

PRELIMINARY

Short title, application and commencement

1. (1) This Act may be cited as the National Water Resources Act of 20.... and shall apply to Peninsular Malaysia and the Federal Territory of Labuan.

(2) This Act comes into operation on a date to be appointed by the Minister by notification in the Gazette.

(3) This Act shall not come into force in a State unless it has been adopted by a law made by the Legislature of the State pursuant to Clause (3) of Article 76 of the Federal Constitution.

(4) This Act shall, in relation to any Federal Territory, come into operation on such date as the Minister may, by notification in the Gazette, appoint; and in its application in such Territory this Act shall be subject to such modification as the Minister may, from time to time, by order provide.

Interpretation

2. In this Act, unless the context otherwise requires -

"activity" means any act or failure to act which has an impact on the quality, quantity, flow or availability of water resources;

"aquifer" means a geologic structure or formation that holds water or is capable of holding water permanently or intermittently;

"bank" in relation to a water resource means any naturally or artificially formed bank of a water resource;

"bed" in relation to a water resource means the land bounded by the banks closest to the water resource;

"beneficial use" means the use of water in the right amount during the period that it is required to produce the benefits for which the water is appropriated;

"catchment" means any area from which a water resource receives surface flow which originates as precipitation;

"coastal waters" means such part of the sea adjacent to the coast as deemed by law to constitute the territorial waters of the State;

"Director General" means the Director General of Water Resources appointed under section 5;

"environment" means the physical factors of the surroundings of human beings including land, water, atmosphere, climate, sound, odour, the biological factors of animals and plants and the social factor of aesthetics;

"estuary" means a partially, intermittently or fully enclosed body of water which is open to the sea permanently or periodically and into which fresh water is drained from the land;

"flood zone" means any area adjoining a river which is susceptible to flooding;

"foreshore" has the same meaning assigned to it in the National Land Code, 1965 [*Act 56*];

"Fund" means the Fund established under Part IV;

"groundwater" means the subsurface water that occurs beneath the water table in soils and geologic formations and includes –

(a) a well, borehole or similar work sunk into underground strata, including any adit or passage constructed in connection with the well, borehole or work for facilitating the collection of water in the well, borehole or work; and

(b) any excavation into underground strata where the level of water in the excavation depends wholly or mainly on water entering it from the strata;

"Government entity" means –

(a) the Federal Government, any State Government or local government; or

(b) any ministry, department, office, agency, authority, commission, committee, board, council or other body, corporate or unincorporated, of the Federal Government, any State Government or local government, whether established under any written law or otherwise;

"land" has the same meaning assigned to it in the National Land Code, 1965 [*Act 56*];

"management plan" means the plans made under section 30;

"Minister" means the Minister with responsibility for water resources, land and environment;

"National Council" means the National Water Resources Council established under section 4;

"occupier" means a person in occupation or control of –

(a) any premise;

(b) in relation to a premise where different parts of it are occupied by different persons, the respective persons in occupation or control of each part; or

(c) any vehicle or vessel;

"pollutants" means any natural or artificial substances, whether in solid, semi solid or liquid form, or in the form of gas or vapour, or in a mixture of at least two of these substances, or any objectionable odour, noise or heat emitted, discharged or deposited or is likely to be emitted, discharged or deposited from any source which can directly or indirectly cause pollution and includes any environmentally hazardous substances;

"pollution" means any direct or indirect alteration of the physical, thermal, chemical or biological properties of any part of the environment or the discharging, emitting, or depositing of environmentally hazardous substances, pollutants or waste so as to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety or welfare, or to birds, animals, wildlife, fish or aquatic life, or to plants, or to cause a contravention of any condition, limitation, or restriction to which a licence under this Act is subject;

"premise" includes any building or structure or any part thereof (whether completed or not), land and any wharf, pier, landing facility, vessel and any structure floating, submerged or erected on any water resource;

"prescribed" means prescribed by regulations, written directive or order under this Act;

"protected area" means any protected area declared under section 35;

"public purpose" means those uses which comprise the Federal or State's interest in any water resource including but not limited to navigation, recreation, fishing, storage, energy production, flood mitigation, cloud seeding, conservation of water resources, public health, pollution prevention and abatement, conservation and use of biodiversity, climate change and aesthetic beauty;

"resources" means any matter, thing, substance or liquid occurring in, related to or dependant on water including –

(a) flora and fauna, biotic communities and their associated ecosystems;

(b) water, mineral, sand or soil;

(c) other natural products;

(d) any area possessing characteristics for public purpose;

"river" means any stream, natural water course or any tributary of a river or any artificial deviation thereof and any instream impoundment thereon;

"river basin" means any river and the catchment area surrounding the river;

"river reserve' means the land area described in section 36 and shall include the bank and bed of a river;

"stakeholder" means any person, organisation or association which has an interest in or may be affected by the development, management, use and conservation of any water resource;

"State Council" means the State Water Resources Council established under section 6;

"State Water Resources Director" means the State Water Resources Director appointed under section 11;

"sustainable" means managing the use and development of resources in such a way and at a rate, which enables people and communities to continuously provide for their social, health, economic and cultural well being, while safeguarding the life supporting capacity of water and protecting those elements of the environment supported by water resources;

"sustainable drainage" means managing rainwater with the aim of –

(a) reducing damage from flooding;

(b) improving water quality;

(c) protecting and improving the environment;

(d) protecting health and safety; and

(e) ensuring the stability and durability of drainage systems.

"vessel" includes any ship or boat or any other description of vessel used in navigation;

"water" includes –

(a) water in water resources;

(b) water returned by artificial means to water resources including drainage and stormwater;

(c) wastewater, sewage and effluent generated by any residential, commercial, industrial or agricultural activity;

(d) precipitation; and

(e) recycled water.

"water body" means any aquifer, lake, pond, wetlands, estuary, coastal waters and other bodies of water natural or artificial and the resources therein;

"water resources" means any river, water body and ground water and the resources within such river, water body or ground water;

"wetlands" means any area or marsh, fen, peat land, swamp or other lowlands seasonally, intermittently or permanently submerged or inundated with water that is static or flowing, whether natural or otherwise, fresh, brackish or saline;

"works" includes any activity related to –

(a) the operations, maintenance, construction, fabrication or assembly of any structure, building, equipment, vessel, embankment, earthworks, fish racks, fish farms or levee on, in or above any water resource and its catchment;

(b) dredging, reclamation, deepening, filling or draining of any water resource and its catchment;

(c) exploration, mining, drilling, piling on any land;

(d) the discharge of any substance, matter or thing directly into any water resource or its catchment;

(e) growing, cutting or felling of any vegetation on any water resource or its catchment; and

(f) the impounding, diverting, discharging, obstructing or interfering with the flow and use of water within any water resource.

General assurance that power of State Government and other Government entities not affected

3. Nothing contained in this Act shall be construed as reducing or limiting the powers, functions, rights, jurisdiction, duties and responsibilities of the State Governments and any other Government entity.

PART II

NATIONAL ADMINISTRATION

Establishment of the National Water Resources Council

4. (1) There shall be established a National Water Resources Council whose functions shall be to -

(a) ensure that water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and the environment;

(b) establish policies, plans, programs and strategies in relation to integrated management of water resources in the country;

(c) establish policies, plans and programs for the demarcation, protection and management of catchment areas;

(d) consider and adopt a national water resources master plan together with strategic policies, indicative plans and programs for its implementation ;

(e) undertake a review of the national water resources master plan every five years in tandem with the National Five Year Development Plans or as may be decided by the National Council;

(f) establish policies and strategies for the implementation of international treaties, agreements and conventions relating to water resources including on wetlands, climate change and biodiversity;

(g) provide advice to Government entities on any matter related to policies, plans, programs, strategies, methods and measures to be adopted to promote, nurture and facilitate the sustainable development, efficient use and conservation of water resources for public purposes;

(h) establish policies and strategies and provide coordination on matters related to transfer of water between two or more states or transfer of water from or to another country;

(i) assist in the settlement of disputes on matters related to the management of transboundary water resources and inter-state transfer of water;

(j) coordinate multi agency relationships among Government entities and promote cooperation and coordination for multi functional uses of water resources;

(k) establish policies and strategies related to scientific research into the management, efficient use, development and conservation of water resources;

(l) adopt policies, plans and programs related to floods, droughts, tsunamis, erosion and sedimentation and other impacts caused by water resources;

(m) require the Director General to undertake auditing and a national census of water resources on a periodic basis;

(n) determine national priorities for the allocation and use of water resources by all sectors;

(o) consider, adopt and publish an annual report on the status of water resources in the country; and

(p) do all things as are expedient, advantageous or necessary for, or incidental to the performance of the role of the National Council and the better carrying out of the purposes and objectives of this Act.

(2) The National Council shall consist of the following members –

(a) a Chairman who shall be the Deputy Prime Minister;

(b) the Minister of Finance;

(c) the Minister with responsibility for water resources, land and environment;

(d) the Minister with responsibility for housing and local government;

(e) the Minister with responsibility for agriculture;

(f) the Minister with responsibility for plantation industry and commodities;

(g) the Minister with responsibility for Federal Territories;

(h) the Minister with responsibility for science, technology and innovation;

(i) the Minister with responsibility for energy, green technology and water;

(j) the Minister with responsibility for public works; and

(k) the Menteri Besar or Chief Minister, as the case may be, of every State.

(3) The provisions of the First Schedule shall apply to the National Council.

(4) The National Council may, from time to time, give the Director General directions which are consistent with the provisions of this Act and the Director General shall give effect to such directions.

Director General and other officers

5. (1) There shall be a Director General of Water Resources whose functions shall be –

(a) to administer this Act and any regulations and orders made hereunder;

(b) to prepare the draft national water resources master plan together with the strategies, policies, indicative plans and action programs for approval of the National Council;

(c) to assist and provide advice to the Minister and National Council on appropriate policies, plans and programs for the integrated management of water resources;

(d) to provide advice, build capacity and assist any Government entity in the adoption and implementation of policies, plans and programs related to integrated water resources management;

(e) to provide advice and assist the National Council in determining national priorities for the allocation and use of water resources by all sectors;

(f) to participate in international forums and bodies and provide advice on the implementation of international conventions, treaties and agreements on water resources to the Minister and the National Council;

(g) to undertake the implementation of international conventions, treaties and agreements on water resources as directed by the Minister;

(h) to ensure coordination among Government entities on matters related to the sustainable development, use and conservation of water resources within the country;

(i) to undertake surveys and investigations and collect and compile data related to the sustainable development, use and conservation of water resources including the location, quantity, quality, use, rehabilitation, compliance with standards and quality objectives, health of aquatic ecosystems and atmospheric conditions which may influence water resources;

(j) to promote, encourage, coordinate and monitor the implementation of national policies, plans and programs related to water resources by Government entities;

(k) undertake periodic auditing and census of water resources in the country including the location, quantity, quality, use, rehabilitation, compliance with standards and quality objectives and health of aquatic ecosystems;

(l) to establish guidelines, standards, criteria, procedures and methodology for the sustainable development, use and conservation of water resources;

(m) to assist the State Council and State Water Resources Director in the identification, demarcation, protection and management of catchment areas;

(n) to mediate and assist in resolving disputes between States over the development, use and conservation of shared water resources;

(o) to adopt and implement appropriate policies, plans and programs for the mitigation of any hazard or emergency caused by water resources including floods, droughts, tsunamis, erosion and sedimentation;

(p) to promote, coordinate and undertake scientific research in any matter related to water resources;

(q) to co-opt any Government entity, person or organisation to form a committee to assist him in the formulation and implementation of any policies, plans and programs related to water resources;

(r) to publish an annual report on water resources and such other reports, bulletins, statistics, monographs and other publications relating to any aspect of the sustainable development, use and conservation of water resources;

(s) to undertake communication, promote education and create public awareness on matters related to the sustainable development, use and conservation of water resources;

(t) to cooperate and liaise with international organisations on matters related to sustainable development, use and conservation of water resources; and

(u) to implement any directions given by the Minister or the National Council on any matter related to the implementation of integrated water resources management in the Country.

(2) There shall be such numbers of Deputy Director General of Water Resources and such other officers as may be necessary and expedient for the due administration of this Act.

(3) The Minister may give to the Director General directions of a general character not inconsistent with this Act as to the exercise of the powers, duties and functions of the Director General under this Act and the Director General shall give effect to any directions so given.

(4) Unless excepted under any regulations made under this Act, any Deputy Director General and such other officers may exercise any powers, duties and functions of the Director General under this Act.

(5) The Director General may, in writing, delegate any of his functions and powers to any Government entity and any function or power so delegated shall be exercised and performed in the name and on behalf of the Director General.

PART III

STATE ADMINISTRATION

Establishment of the State Water Resources Council

6. (1) The State Authority may establish a body corporate by the name of "State Water Resources Council" *[or State Water Resources Authority]*.

(2) The State Council shall have perpetual succession and a common seal.

(3) The State Council may sue and be sued in its own name.

(4) The State Council may, subject to and for the purposes of this Act, upon such terms as the State Council deems fit –

(a) enter into contracts;

(b) acquire, purchase, take, hold and enjoy movable and immovable property of every description and to underwrite or otherwise acquire and hold any securities; and

(c) convey, assign, surrender, yield up, charge, mortgage, demise, reassign, transfer, dispose of, or otherwise deal with, any movable or immovable property including securities, or any interest vested in the State Council.

Functions and powers of the State Council

7. (1) The function of the State Council shall be to implement integrated water resources management in the State and in particular to –

(a) ensure that water resources within the State are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and the environment;

(b) ensure that water is allocated equitably and used beneficially;

(c) provide advice to the State Authority as to the policies, plans, programs, strategies and measures to be adopted for the sustainable development, use and conservation of water resources;

(d) consider and adopt a water resources master plan for the State, consistent with the national water resources master plan, together with strategic policies, plans and programs for its implementation;

(e) undertake a review of the State water resources master plan every five years in tandem with the National Five Year Development Plans or as may be decided by the State Council;

(f) regulate and control inter basin transfer of water resources;

(g) coordinate multi agency relationships among Government entities and promote cooperation and coordination for multi functional uses of water resources;

(h) promote research in the efficient use, development and conservation of water resources;

(i) assist the Director General to conduct scientific research, collect, collate and diseminate data and publish information on water resources;

(j) enable the Director General to undertake activities related to capacity building within the State;

(2) The State Council shall have power to do all things reasonably necessary for or incidental to the discharge of its functions and in particular to –

(a) conduct surveys, carry out feasibility studies and collect information for research and the drawing up of the management plan;

(b) adopt appropriate measures for the implementation of the State and National water resources master plan together with strategic policies, plans and programs for its implementation;

(c) submit periodic reports to the State Authority and Director General on the state and condition of water resources in the State;

(d) identify catchments of water resources and demarcate their boundaries;

(e) advise the State Authority on the demarcation and declaration of protected areas;

(f) formulate, approve and implement strategies and plans for the use, development, conservation, management and control of water resources within protected areas;

(g) set up appropriate mechanisms for proper management of water resources including committees, stakeholder forums and working groups;

(h) set conditions, standards, criteria, guidelines including procedures for the proper management and regulation of any activity or works related to catchments, basins, protected areas, equipment, installations, dams, reservoirs, plants, vessels and structures to be built, operated, abandoned or disposed in any water resource;

(i) encourage and support the formation and operations of stakeholder organisations;

(j) grant licences on such conditions as the State Council may think fit, for any activity or works in any water resource and to regulate the licensees and their activities;

(k) require the investigation of any incident, infringement or accident occurring on or in relation to a water resource;

(l) coordinate the activities of Government entities and stakeholder organisations on matters pertaining to the efficient management, sustainable use and conservation of water resources;

(m) appoint or employ agents, technical advisors, consultants or other persons to transact any business or enter into contracts for the carrying out of any works, for sharing of profits or joint venture with any person or body of persons;

(n) advise the State Authority in respect of the transfer of water from, between and among States and to or from another country;

(o) amicably settle issues related to shared water resources between two or more states;

(p) collect, collate, compile and disseminate data and information as may be required by the Director General; and

(q) to do such other things as are expedient, advantageous or necessary for, or incidental to the performance of the role of the State Council and the better carrying out of the purposes and objectives of this Act.

(2) The State Council shall, in performing its functions, duties and responsibilities, take into consideration national policies, plans and programs established by the National Council and provide assistance to and cooperate with the Director General in their implementation.

(3) The State Council shall, for the purposes of uniformity, take into consideration national standards, criteria, manuals, guidelines and procedures for integrated water resources management as may be determined by the Director General.

Membership of the State Council

8. (1) The State Council shall consist of the following members –

(a) a Chairman who shall be the Menteri Besar or Chief Minister of the State as the case may be;

(b) the State Secretary who shall be the Deputy Chairman;

(c) the State Legal Advisor or his representative;

(d) the State Financial Officer or his representative;

(e) the State Executive Council member with responsibility for water resources;

(f) the State Executive Council member with responsibility for environmental matters;

(g) the representative of the Director General; and

(h) not more than five other members to be appointed by the State Authority who shall have substantial expertise in matters pertaining to water resources.

(2) The State Water Resources Director shall be the Secretary to the State Council.

(3) The provisions of the Second Schedule shall apply to the State Council.

(4) The State Authority may, from time to time, give to the State Council general directions not inconsistent with this Act and the State Council shall, as soon as possible, give effect to the directions.

State Council may establish committees

9. (1) The State Council may establish such committees as the State Council considers necessary or expedient to assist it in the performance of its functions and carrying out of its powers under this Act.

(2) The State Council may elect any of its members to be the Chairman of any committee.

(3) The State Council may appoint any person, including one or more persons from the private sector, to be a member of any committee.

(4) The provisions of the Third Schedule shall apply to a committee.

(5) The State Council may, from time to time, by order published in the Gazette, amend the Third Schedule relating to a committee.

Delegation of functions and powers of the State Council

10. (1) The State Council may, in writing and subject to such conditions, restrictions or other requirements as the State Council deems fit, delegate any of its functions and powers, other than its power to make regulations, borrow money or raise loans –

(a) to the Chairman of the State Council;

(b) to a member of the State Council;

(c) to a committee;

(d) to the State Water Resources Director;

(e) to any officer of the State Council; or

(f) to the Director General or his officers.

(2) Any function or power delegated by the State Council under subsection (1) shall be exercised and performed in the name and on behalf of the State Council.

(3) A delegation under this section shall not preclude the State Council itself from performing or exercising at any time any of the delegated function or powers.

Appointment of State Water Resources Director and other Officers

11. (1) The State Council may, with the approval of the State Authority, appoint a State Water Resources Director on such terms as the State Council may determine.

(2) The State Water Resources Director shall have the following functions -

(a) the general conduct, administration and management of the functions, activities and day to day affairs of the State Council;

(b) the preparation of policies, plans and programs for the consideration of and adoption by the State Council;

(c) to keep the State Council informed and updated on the policies, plans and programs of the National Council;

(d) to cooperate with and assist the Director General in the performance of his duties and functions;

(e) the execution of all policies, plans and programs of the State Council; and

(f) the carrying out of the decisions of the State Council.

(3) The State Water Resources Director shall perform such further duties as the State Council may, from time to time, direct.

(4) The State Water Resources Director shall be responsible for and have the general control of the officers and servants of the State Council.

(5) In discharging his duties, the State Water Resources Director shall act under the general authority and direction of the State Council.

State Council may establish a scheme of service

12. The State Council may, with the approval of the State Authority, establish a scheme of service and may, from time to time, employ such number of officers and servants as the State

Council thinks desirable and necessary to such scheme of service and upon such terms, including terms as to remuneration, allowances and other expenses and discipline as the State Council considers appropriate, for carrying out the purposes of this Act.

PART IV

FINANCE

Establishment of the Fund

13. (1) The State Authority may establish a fund, known as "the Fund" which shall be administered and controlled by the State Council.

(2) The Fund shall consist of -

(a) such sums as may be provided from time to time by the State and Federal Government;

(b) such sums as may be allocated from time to time to the State Council from the proceeds of loans raised by the State Authority;

(c) such sums as may be borrowed by the State Council, from time to time, for the purposes of meeting its obligations or discharging any of its powers and functions;

(d) monies earned by the State Council from any project, scheme or program financed from the Fund;

(e) monies earned or arising from any property, investment, mortgage, charge or debenture acquired by or vested in the State Council;

(f) any fees or other charges prescribed and collected by the State Council; and

(g) all other sums or property which may in any manner become payable to or vested in the State Council in respect of any matter incidental to its functions and powers.

(3) The Fund shall be expended for the following purposes -

(a) any expenses, costs or expenditure lawfully incurred or accepted by the State Council in the performance of its functions or exercise of its powers under this Act including –

(i) implementation of policies, plans and programs adopted by the National Council and State Council;

(ii) implementation of plans, programs, guidelines, standards, criteria, procedures and methodology proposed by the Director General;

(iii) hiring the services of consultants, technical or other advisers; and

(iv) promoting scientific research, information management, survey and legal fees and costs;

(b) purchasing or hiring plant, equipment, machinery and materials, acquiring land and other assets, and erecting buildings, and carrying out any other works and undertakings in the performance of functions or exercise of its powers under this Act;

(c) repayment of any moneys borrowed under this Act and the interest due on the borrowed moneys;

(d) allowances and other expenses of the members of the State Council and any committee established by the State Council and any person invited to attend meetings of the State Council or any committee;

(e) remuneration, allowances and other expenses of the State Water Resources Director, officers and servants of the State Council including granting of loans and advances, superannuation allowances, retirement benefits, pensions and gratuities; and

(f) any subsidy or credit facility granted by the State Council pursuant to its powers under this Act.

State Council to sanction expenditure from the Fund

14. (1) The State Council may delegate to the Chairman, a member of the State Council, a committee, the State Water Resources Director or an officer of the State Council the authority to sanction expenditure from the Fund or any other moneys vested in and under the control of the State Council up to such limit as the State Council shall specify.

(2) The Chairman, a member of the State Council, a committee, State Water Resources Director or an officer of the State Council authorised to sanction expenditure from the Fund shall be bound to observe and have regard to all conditions and restrictions imposed by the State Council and all requirements, procedures and matters specified by the State Council.

Borrowing powers

15. The State Council may, with the approval of the State Authority and upon such terms and conditions as may be determined by it, borrow such sums as the State Council may require for discharging any of its functions and powers under this Act.

Expenditure and preparation of estimates

16. (1) The expenditure of the State Council, up to such amount as may be authorised by the State Authority, for any one year shall be defrayed out of the Fund.

(2) Before the beginning of July or such other time as may be determined by the State Authority, the State Council shall submit to the State Authority an estimate of the expenses for the following year in such form and with such particulars as the State Authority may require and the State Authority shall before the beginning of that following year notify the State Council of the amount authorised for expenses generally or of the amount authorised for each description of expenditure.

(3) The State Council may at any time submit to the State Authority a supplementary estimate for any one year and the State Authority may allow the whole or any part of the additional expenditure included in the supplementary estimate.

Investment

17. The Fund of the State Council may, in so far as it is not required to be expended by the State Council, be invested in such manner or be deposited in such financial institutions as the State Authority may approve.

Financial year

18. The financial year of the State Council shall begin on 1 January and end on 31 December of each year.

Accounts and audit

19. (1) The State Council shall keep proper accounts and other records of the State Council's transactions and affairs in accordance with generally accepted accounting principles and shall do all things necessary to ensure that all income are properly accounted for and that all expenditures out of the Fund is properly authorised and that adequate control is maintained over the assets or is in the custody of the State Council and over the incurring of any liability by the State Council.

(2) The accounts shall be audited annually by the Auditor General or such other auditor as may be appointed by the State Council with the approval of the State Authority.

(3) The State Council shall within six months after the end of each financial year have its accounts audited and transmitted to the State Financial Officer together with a copy of any observation made on the accounts by the auditor appointed under subsection (2) and a copy of the annual report referred to in section 18.

(4) The Menteri Besar or Chief Minister, as the case may be, shall cause a copy of every such statement together with a copy of any observation made on the accounts by the auditor appointed under subsection (2) and a copy of the annual report referred to in section 18 to be laid on the table of the next meeting of the State Legislature Assembly.

Investigation of accounts

20. (1) The State Authority may at any time direct such person as the State Authority may appoint to make an investigation of the books, accounts and transactions of the State Council.

(2) The State Council shall afford such person access to its books, accounts and documents and give such information as may be required by the person to conduct the investigation.

Annual Report

21. (1) The State Council shall not later than the 30th day of June of each financial year cause to be made and transmitted to the Menteri Besar or Chief Minister, as the case may be, a report dealing with the activities of the State Council during the preceding year.

(2) The Menteri Besar or Chief Minister, as the case may be, shall cause a copy of every such report to be laid before the State Legislative Assembly.

PART V

USE OF WATER RESOURCES

Responsibility for water resources

22. (1) The State Council shall be responsible for water resources in the State including but not limited to the sustainable development, management, use and conservation of the water resources and its catchment.

(2) Where any other Government entity has been given any task or responsibility similar to subsection (1) under any other law, it shall co-operate with, coordinate and assist the State Council in the performance of its functions.

(3) The State Council, in order to effectively carry out its functions, may request any Government entity within the State –

(a) to provide such assistance and information in their possession as may be required by the State Council;

(b) to make such inquiry as may be necessary;

(c) to develop or modify their policies, plans, programs or strategies so as to be consistent with that made under this Act;

(d) to include in the licences, permits and approvals issued by the Government entity such conditions and requirements as may be specified under this Act; and

(e) to require any person, whether local or foreign, to submit reports, containing such particulars and information as may be specified by the State Council, relating to their activities or works.

Control of use of water resources

23. (1) Subject to section 27, no person or Government entity, unless expressly permitted by a licence issued by the State Council under this Act, shall –

(a) store any water;

(b) take or use any water resource;

(c) return any water to a water resource;

(d) engage in any activity or works that may interfere with or alter the flow of water in a water resource;

(e) discharge waste or water containing waste into a water resource through a drain, pipe, canal, sewer, outfall or other conduit;

(f) dispose in any manner into a water resource, water which contains waste from, or which has been heated in, any industrial or power generation process; or

(g) alter the bed, banks, course or characteristics of a water resource.

(2) In the exercise of the powers conferred by subsection (1), the State Council may take such measures and impose such conditions as it thinks fit for the protection and control of water resources including –

(a) the sustainable development, use and conservation of its resources;

(b) the equitable allocation and distribution of water;

(c) the protection of water resources and its catchment from pollution;

(d) ensuring the availability of water for beneficial use; and

(e) the mitigation and control of, in consultation with the Director General, water hazards including floods, droughts and tsunamis.

(3) Any person to whom a licence is issued under subsection (1) for the carrying out of any works related to ground water shall submit a copy of the technical reports related to such works to the Director General of Minerals and Geosciences Department.

(4) No person shall, unless permitted by a licence under this Act and subject to such conditions as the State Council may impose, transfer any water which has been conserved through the adoption of efficient practices to any other person.

(5) The State Council may, at the request of a person licensed to use water under this Act, allow that person on a temporary basis and on such conditions as the State Council may determine, to use some or all of that water for a different purpose, or to allow the use of some or all of that water on another property in the same vicinity for the same or a similar purpose.

(6) The State Water Resources Director may order any person or Government entity to fit a measuring or recording device which is approved by the State Water Resources Director to measure the quantity and quality of water taken, transferred, used or returned and to submit at regular intervals such information as may be stipulated by the State Water Resources Director.

Diversion of waters

24. (1) No person or Government entity shall, except as permitted by a licence issued by the State Council, by any means disrupt, impede or divert the natural flow of water in any water resource.

(2) Whenever any such disruption, impedance or diversion has been made, the occupier of the lands benefited by such disruption, impedance or diversion shall, in the absence of proof to the contrary, be presumed to have made it.

(3) Licences to disrupt, impede or divert water from a river for use to generate electricity may be granted by the State Council with the approval of the State Authority.

(4) An applicant for a permit under any law relating to mining for the diversion, impedance, disruption or extraction of water from or the discharge of any substance into any water resource

shall, prior to making his application, submit to the State Water Resources Director details of his intended activity and works accompanied by studies by experts acceptable to the State Council showing that the activity is sustainable.

(3) Upon examination of the particulars submitted under subsection (4), the State Water Resources Director shall issue comments in writing on the activity and works to the relevant authority, which comments may include recommendations to the relevant authority on the approval or rejection of the application or approval with conditions to be incorporated in any permit issued by it.

Power of State Director in water resources and its catchment

25. (1) If in the opinion of the State Water Resources Director, an activity or works, structure or building, within a water resource or its catchment is causing a reduction in the volume or flow of water, degradation of the quality of water or has an adverse impact on the use and conservation of resources, the State Water Resources Director may by order direct the person undertaking the activity or works or the owner or occupier of the structure or building -

(a) to modify or cease the activity or works; and

(b) to modify, relocate or remove the structure or building.

(2) Any person who contravenes this commits an offence and shall, on conviction, be liable to a fine not exceeding one million ringgit or to imprisonment for a term not exceeding five years, or to both and any building or construction built or erected in contravention of this section may be removed or caused to be removed by order of the State Water Resources Director and the cost of such removal shall be borne by such person.

Power to impose charges

26. (1) The State Council may, with the approval of the State Authority, by notification in the Gazette, impose a charge on –

(a) the use of water or any other resource from any water resources including but not limited to the abstraction, extraction, discharge, drainage, diversion and impoundment of such water or other resources; and

(b) the return of water or discharge of waste, effluent or any polluting matter into any water resource or drainage system.

(2) The charge under subsection (1) shall be based upon a pricing strategy adopted by the State Council to fund the implementation of integrated water resources management including –

(a) the sustainable development and use of the water resource;

(b) the cost of various measures, plans and programs;

(c) for achieving an equitable and efficient allocation of water;

(d) the adoption of preventive and mitigation measures to control environmental impact of the activity or works; and

(e) the cost of rehabilitation, remediation and restoration of any water resource.

(3) The State Council may, with the approval of the State Authority, exempt any person or class of persons from all or part of the charges upon a written application for exemption made by such person.

(4) The State Water Resources Director may, in the event the amount of water or resource used by any person has not been measured or any device used to measure has failed to determine the amount accurately, make an estimation of the amount of water or resource used by the person for any period and the said person shall pay the applicable charges prescribed under this Act.

(5) In the event any charge imposed under subsection (1) remains unpaid and in arrears for more than sixty days the State Council may refuse to supply the water or the resources as the case may be and the State Council may take such steps as it may deem necessary to stop the discharge, flow or supply of the water or the resources.

(6) Any person who fails to pay any charge imposed under this section commits an offence and shall, on conviction, be liable to a fine of not exceeding one million ringgit or to imprisonment for a term not exceeding five years or to both.

Rights to water for subsistence purposes

27. (1) The owner or occupier of any premise may, without a licence or charge, abstract water sufficient for his household and subsistence agricultural use from ground water under his premise or from any river or water body with frontage to the premise owned or occupied by him provided that –

(a) it does not cause a significant obstruction to or diversion of the flow of water in a river or water body;

(b) the amount abstracted in a day does not exceed ten cubic metres or such other amount as the State Council may, from time to time, determine;

(c) in the case of ground water, the amount to be abstracted in a day shall be determined by the State Water Resources Director and the abstraction does not require a well to be drilled.

(2) The exemption under subsection (1) shall not apply if the State Water Resources Director determines, either permanently or for a specified period of time, that the abstraction is being used improperly or it poses a threat to the resources in any water resource.

(3) The State Water Resources Director may direct a person exercising a right conferred by this section to install and operate a device to regulate or monitor the use of water.

Control of wastage of water

28. (1) The State Council may, by directive in writing, order any person or Government entity to take appropriate measures to prevent water taken from a water resource from being wasted or improperly used.

(2) Any person or Government entity, granted the right to take and use water under this Act or any other written law, shall comply with any directive made under this section.

Extraction of sand and other materials

29. (1) No person shall, except with a licence issued by the State Council, extract sand or other materials from any water resource or engage in any activity or works which alters the nature of the bed, bank or shores of the water resource. Any such extraction, activity or works shall only be carried out in accordance with such conditions as the State Council may stipulate and shall be –

(f) at a site identified in an approved integrated water resources or river basin management plan;

(g) at any other site provided that the application for approval is accompanied by studies by experts acceptable to the State Council showing that the activity is sustainable.

(2) An applicant for a permit under the National Land Code *[Act 56]* for the extraction of sand and rock materials, shall prior to making his application, submit to the State Water Resources Director details of his intended activity and works, showing in particular his compliance with the requirements under subsection (1).

(3) Upon examination of the particulars submitted under subsection (2), the State Water Resources Director shall issue comments in writing on the activity and works to the relevant authority, which comments may include recommendations to the relevant authority on the approval or rejection of the application or approval with conditions to be incorporated in any permit issued by it.

PART VI

PLANNING

Preparation of integrated management plans

30. (1) The State Water Resources Director shall, with the cooperation and participation of the Director General, other Government entities and stakeholders, prepare an integrated management plan for any water resource according to the priorities, geographical areas and timetable as determined by the State Council.

(2) Every integrated management plan shall include –

(a) a statement of the objectives of the plan including the sustainable use and conservation of all resources;

(b) a review of the other policies and plans including land use plans which have an impact on water resources;

(c) identification and demarcation of the catchment area of the water resource;

(d) the status of the quality and quantity of water including current condition and development trends;

(e) the activities that significantly influence the sustainability, quantity and quality of the resources and assess these impacts;

(f) the water quality objectives for the water resources;

(g) strategies and measures for the integrated management of water resources including the protection, conservation, development and use of water resources;

(h) key result areas and performance indicators for the achievement of the objectives and implementation of the measures proposed under the management plan; and

(i) identification of river reserves, protected areas referred to in section 35 and areas for extraction of sand and other materials referred to in section 29.

(3) An integrated management plan shall be prepared for each river basin and, upon approval of the State Council, shall be valid for five years.

(4) At least one year before the expiry of the period referred to in subsection (3), the State Water Resources Director shall undertake a review of the management plan and submit it to the State Council for its approval.

(5) Notwithstanding subsections (3) and (4) the integrated management plan may be reviewed, altered, amended or replaced by a new integrated management plan at any time as the State Council may think fit.

Comments and objections from the public

31. (1) As soon as practically possible after a draft management plan or a proposal for a review, alteration or amendment to an existing management plan for a river basin or water body has been submitted to the State Council, the State Water Resources Director shall –

(a) publish, in three issues of at least two newspapers, of which one shall be a newspaper in the national language, a notice stating that copies of the plan are available for inspection at the office of the State Council and at such other places as it may specify and the period within which comments and objections to the plan can be submitted to the State Council; and

(b) make copies of the plan available for inspection by the public at the places stated in the notice.

(2) Comments and objections to the draft plan shall be made not more than one month from the date of the first appearance of the notice under subsection (1)(a).

(3) The State Water Resources Director shall submit for the consideration of the State Council, all comments and objections received from the public in respect of the draft management plan and the State Council shall then decide whether the management plan should be revised, amended or withdrawn.

(4) Where a management plan for a river basin or water body is approved by the State Council, it shall be submitted to the State Authority for its confirmation, whereupon the plan shall come into effect.

(5) Notice of the State Authority's confirmation of the management plan shall be published in the Gazette and in at least two local newspapers, of which one shall be a newspaper in the national language together with a statement of the places where the plan may be inspected.

Integrated Management plan for interstate water resources

32. (1) The State Water Resources Director shall, where any water resource is not located wholly within the State, undertake the preparation of the integrated management plan jointly and in consultation with the relevant State.

(2) The State Water Resources Director shall consult the Director General in the preparation of the management plan under subsection (1).

(3) In the event the States are unable to resolve any dispute or point of disagreement in the preparation of the joint management plan under subsection (1), the State Council or the Director General may refer the matter to the National Council to be resolved.

(4) Any integrated management plan adopted by the National Council pursuant to subsection (3) shall be implemented by all the States where the water resource is located.

Implementation of management plan by Government entity

33. (1) Where a management plan has been confirmed by the State Authority, every Government entity within the State shall take action to implement those measures of the plan that require action by the respective Government entity, and shall exercise its functions in a manner that gives effect to the objectives of such a plan.

(2) Where the State Council identifies a lack of progress in the implementation of the management plan, the State Council may direct the Government entity to take any necessary action or measure as it thinks fit.

Resource use efficiency

34. (1) The State Council shall, in consultation with the Director General, develop and implement efficient practices for the conservation and sustainable use of water resources.

(2) The State Council shall, in developing and implementing efficient practices, take into consideration -

(a) resource availability and sustainable yield;

(b) any management plan made under section 30;

(c) drought, flood or other variances from the normal situation including the impact of climate change;

(d) economic and social factors affecting the people;

(e) technological advances;

(f) institutional capacity;

(g) time, cost, personnel and financing to implement the measures; and

(h) plans, programs, guidelines, standards, criteria, procedures and methodology proposed by the Director General.

(3) The State Council may, by notice in writing, require any person or Government entity to adopt and implement such efficient practices as may be determined pursuant to subsection (2).

(4) Notwithstanding the provisions of section 27, the State Council may, for the purpose of encouraging efficient practices impose a differentiated charge on persons who adopt such practices.

PART VII

PROTECTED WATER RESOURCES AREA

Declaration of protected areas

35. (1) The State Council may, with the approval of the State Authority, declare any area or part thereof to be a protected –

(a) river reserve;

(b) resource conservation area;

(c) shore reserve;

(d) catchment area;

(e) flood zone;

(f) problem soil area; or

(g) water intake area.

(2) Every declaration made under subsection (1), except for paragraph (a), shall –

(a) demarcate the limits of the protected area;

(b) briefly describe the purpose for which the area is being reserved;

(c) the types or classes of activity or works to which specified measures are to apply;

(d) the terms, conditions and restrictions that apply to such activity or works;

(e) the type of activity or works that is prohibited; and

(f) be conclusive evidence that the area so described is reserved for a public purpose.

(3) No person or Government entity shall, unless permitted by a licence issued by the State Council, undertake any activity or works within a protected area declared under subsection (1) unless the activity or works is of a type which the State Council has, by order published in the Gazette, exempted.

(4) The State Water Resources Director may order any person or Government entity undertaking any activity or works within a protected area or the catchment adjacent to the protected area or the owner or occupier of any land, structure or building -

(a) to modify, relocate or cease the activity or works;

(b) to modify, relocate or remove the structure or building;

(c) to stop the removal of any resource or deposition of any material;

(d) to take measures to slow down, reduce or prevent water, effluent, waste or any other substance from being discharged or running off the premise into the protected area;

(e) to stop the clearing of vegetation, trees and riparian growth and require the planting of specific types of vegetation;

(f) to make an assessment of the environmental impact of any proposed works or activity and to implement measures to prevent, reduce, abate or control any adverse environmental impact that is identified;

(g) to restore and rehabilitate the protected area to a condition as shall be prescribed by the State Water Resources Director; and

(h) to take such other measures as the State Water Resources Director may specify to prevent the degradation of water resources.

(5) Any Government entity undertaking any activity or works within a protected area including the alienation, sub-division, partition, amalgamation, classification or conversion of land and the drawing up of structure plans and local plans shall consult with and obtain the State Council's advice prior to the commencement of such activity or works.

(6) Where land within a protected area is alienated land, the State Authority may, if it considers expedient to do so, cause such land to be acquired for a public purpose under the Land Acquisition Act 1960 *[Act 486]*.

(7) Any person who contravenes this section commits an offence and shall, on conviction, be liable to a fine of not exceeding three hundred thousand ringgit or to imprisonment for a term not exceeding three years or to both and to a further fine of ten thousand ringgit for every day that the offence is continued after a notice by the State Council requiring compliance has been served, and any structure or building built or erected in contravention of this section may be removed or caused to be removed by order of the State Water Resources Director and the cost of such removal shall be borne by such person.

(8) For the purposes of this section the term –

"problem soil areas" means any land adjoining a water resource where a lowering of the water table may lead to depletion of water, subsidence of land, spontaneous combustion and other adverse effects.

"shore reserves" means the land adjoining any water body up to such distance as may be determined under subsection (2).

River Reserves

36. (1) For purposes of this Act, river reserves shall comprise the following areas of land -

(a) within fifty metres from the bank of a river, including its estuary, where the river channel is forty metres or more in width;

(b) within forty metres from the bank of a river, including its estuary, where the river channel is twenty metres or more but less than forty metres in width;

(c) within twenty metres from the bank of a river, including its estuary, where the river channel is ten metres or more but less than twenty metres in width;

(d) within ten metres from the bank of a river, including its estuary, where the river channel is five metres or more but less than ten metres in width; or

(e) within five metres of the bank of a river, including its estuary, where the river channel is one metre or more but less than 5 metres in width.

(2) The State Council may, with the approval of the State Authority, by order published in the Gazette –

(a) review and revise the distances specified in subsection (1) from time to time;

(b) vary the distances specified in subsection (1) for built-up areas; and

(c) vary the distances specified in subsection (1) for areas prone to floods and tidal inflows.

(3) No person or Government entity shall, unless permitted by a licence issued by the State Council, undertake any activity or works in a river reserve.

(4) The State Council may, by order published in the Gazette, exempt any type of activity or works from being licenced under this section.

(5) If in the opinion of the State Water Resources Director any building or structure, activity or works within a river reserve is causing interference or a reduction in the volume or flow of water, degradation of the quality of water or an adverse impact on the use of water, the State Water Resources Director may, by order, direct the person or Government entity undertaking the activity or works or the owner or occupier of the premises to -

(a) modify, relocate or cease the activity or works;

(b) modify, relocate or remove the structure or building; and

(c) restore and rehabilitate the river reserve and water body to a condition as shall be prescribed by the State Water Resources Director.

PART VIII

CONTROL OF WATER HAZARDS

Stormwater control

37. (1) No person or Government entity shall undertake any activity or works on land unless measures are in place to avoid or minimise soil erosion, sedimentation, or pollution of water resources.

(2) Where the activity or works constitutes development of land or construction, any person or Government entity required to make an application for approval of the relevant authority in respect of such activity or works shall also submit to the State Water Resources Director -

(a) an earthworks plan showing the measures to mitigate pollution, erosion and sedimentation;

(b) a report on sustainable drainage consisting of –

(i) a calculation of the contribution of the proposed development and works to the peak stormwater discharge from the land; and

(ii) a drainage layout plan describing the proposed on-site measures to control and mitigate any adverse impact of the peak stormwater discharge from the land; and

(iii) the estimated cost of construction and maintenance of the proposed drainage infrastructure.

(3) Every such plan and report made under subsection (2) shall comply with the manuals, procedures, standards and guidelines issued from time to time by the Director General.

(4) For the purposes of this section, the term "development" shall mean the carrying out of any works in, on, over, or under any land, the making of any material change in the use of any land or building or any part thereof, or the subdivision or amalgamation of lands.

Flood Defence

38. The State Council shall, in consultation with the Director General, prescribe such measures as it deems fit for the control and management of floods including -

(a) the formation, organisation and operations of flood defence committees for river basins;

(b) the adoption of mitigative measures to lessen the impact of flooding;

(c) such directives, guidelines, standards and manuals as may be determined by the Director General;

(d) such other matters as may be determined by the State Council to be necessary for the proper management of flood defence.

Mitigation of flood disasters

39. (1) In the event of danger from impending floods and the State Water Resources Director is satisfied that it is necessary to take steps to minimise damage, the State Water Resources Director, with advice and assistance of the Director General and any other Government entity charged with responsibility for national security and civil defence, may –

(a) enter upon the required premise;

(b) use or cause to be used or requisitioned any material, vehicle, animal or tools;

(c) dispose, remove or destroy or caused to be disposed, removed or destroyed any structures, works or obstacles; and

(d) require such persons as the State Water Resources Director thinks necessary to assist him.

(2) The Director General may, in order to minimise damage and mitigate the impact of floods, take such measures and give such orders and directives as he deems necessary to the State Water Resources Director who shall be subject to and act in accordance with every such order and directive.

(3) Any damage sustained by any person, owner or occupier in consequence of the exercise of the powers given by this section may be compensated by the State Council for such loss as would ordinarily be incurred.

Action during periods of drought

40. In the event that a serious deficiency of supply of water exists in any area or is threatened to arise, the State Council may, with the approval of the State Authority, by order in writing –

(a) take or direct any person to take water from any water resource or discharge water to any place as may be specified in the order;

(b) prohibit or limit the taking by any person of water from any water resource;

(c) direct any person to execute any works required for the performance of any duty or exercise of any power which is imposed or conferred by the order;

(d) suspend, vary or modify any restriction or obligation to which the State Council is subject to in respect of the taking and supplying of water.

Mitigation of accidental pollution of water resources

41. (1) In the event there occurs pollution of water resources due to an accident resulting in or which gives rise to a risk of significant contamination of any water resource, the person involved shall immediately take such measures as are necessary to minimise the impact or risk to the water resource and shall promptly inform the Police or the State Water Resources Director.

(2) The State Water Resources Director shall take such action as he thinks fit to address the threat of pollution stated in subsection (1) and, in order to obtain assistance, may -

(a) issue a directive to any person or Government entity; and

(b) request the Director General.

Prohibition of pollution of water resources

42. (1) Save as may be expressly authorised under any written law, no person shall, except under a licence issued by the State Council, cause to enter or discharge any pollutant into –

(a) any water resource; or

(b) any land in circumstances which may result in any pollutant entering a water resource.

(2) Whenever any entry or discharge described in subsection (1) has been made, the owner or occupier of the premise from which such entry or discharge originates shall, unless the contrary is proved, be presumed to have caused the entry or discharge.

(3) When granting a licence under subsection (1) the State Council shall –

(a) ensure that the allowed discharge will not pose any threat to or impact on the quality, quantity or flow of water or the resources in a water resource;

(b) take into account the relevant water quality criteria, conditions and objectives set out in the applicable management plan or otherwise as set out by this Act;

(c) take into account the cumulative effect of all discharges into the receiving waters; and

(d) take into consideration national standards, criteria, manuals, guidelines including procedures set down by the Director General.

(4) Every Government entity issuing a licence for the discharge of pollutants into any water resource shall ensure and take into account the conditions specified in subsection (3).

(5) Where any pollution occurs due to any activity or works, the licencee, person, owner or occupier or Government entity performing the activity or works or responsible for the activity or works must immediately inform the State Water Resources Director and on its own take all reasonable measures to remedy and mitigate the adverse effects of the pollution.

(6) Any person who contravenes this section commits an offence and shall, on conviction, be liable to a fine of not exceeding three hundred thousand ringgit or to imprisonment for a term not exceeding three years or to both and to a further fine of five thousand ringgit for every day that the offence is continued after a notice by the State Council requiring compliance has been served.

PART IX

CONTROL OF OTHER ACTIVITIES

Control of navigation

43. (1) No person shall, except as authorised under any other written law, navigate a vessel on any river or water body without a licence issued by the State Council.

(2) The State Council may, in order to ensure safety of the public and protection of the environment, prescribe -

(a) the registration of all vessels;

(b) the type or classes of vessel that may be used on any river or water body including its fitting and equipment;

(c) the operational requirements including the speed limits, approved routes and permissible draught;

(d) measures for the prevention and control of pollution; and

(e) the charges for registration of the vessels and for any other services provided by the State Council.

(3) Any person who contravenes this section commits an offence and shall, on conviction, be liable to a fine of not exceeding three hundred thousand ringgit or to imprisonment for a term not exceeding three years or to both and to a further fine of five thousand ringgit for every day that the offence is continued after a notice by the State Council requiring compliance has been served.

Control of recreational activities

44. (1) The State Council may, unless otherwise authorised by any other written law, require any recreational or leisure activity on or in any river or water body to be licensed.

(2) The State Council may, in order to ensure safety of the public and protection of the environment, prescribe -

(a) measures to prevent damage to the bed, bank, shore or resources in the river or water body;

(b) the type of equipment that may be used on any river or water body including its fitting and appliances;

(c) measures to ensure the safety of the operator and person engaged in the recreational activity;

(d) measures to prevent danger or nuisance to any person or property or other licensed activities including navigation;

(e) measures for the prevention and control of pollution; and

(f) the charges for any services provided by the State Council.

(3) Any person who contravenes this section commits an offence and shall, on conviction, be liable to a fine of not exceeding fifty thousand ringgit or to imprisonment for a term not exceeding one year or to both and to a further fine of two thousand ringgit for every day that the offence is continued after a notice by the State Council requiring compliance has been served.

PART X

PROCEDURES FOR LICENSING, APPROVALS AND APPEALS

Application

45. (1) Every application for a licence shall be in such form as may be prescribed and shall be accompanied by –

(a) information on the nature of the activity or works;

(b) information on the impact of such activity or works on the water resource and measures to prevent and mitigate any adverse effects of such activity or works;

(c) such other information as required by this Act or requested in writing by the State Water Resources Director; and

(d) such fees as may be prescribed.

(2) Where the application is not complete as required under subsection (1) it shall be returned to the applicant.

(3) The State Water Resources Director may, at any time after a complete application is lodged, require the applicant to provide such additional information as the State Water Resources Director deems necessary, including –

(a) information about the measures proposed as being the best available technology in preventing or mitigating any adverse effects on the environment; or

(b) where the measures proposed are based on alternative technology, information on the efficiency and effectiveness of the alternative technology.

Public comments and objections on significant activities

46. (1) The State Water Resources Director may, no later than two weeks after having received a complete application relating to a significant activity or works, publish a notice in at least two local newspapers, of which one shall be a newspaper in the national language, containing particulars of the application and the deadline for lodging comments and objections.

(2) For purposes of this section a significant activity or works, other than the management plan, is –

(a) any activity or works which in the opinion of the State Water Resources Director is likely to have a significant impact on the quality, quantity or flow of water or on the resources;

(b) the abstraction or diversion of water which, in the opinion of the State Water Resources Director, affects the beneficial use;

(c) the impoundment of water for any purpose including dams, barrages and tidal gates;

(d) the discharge of effluents or pollutants into any water resource at a rate of more than ten cubic metres per day or such other rate as may be stipulated by the State Water Resources Director;

(e) any works and structures that may obstruct the flow of water or navigation;

(f) any other activity that may be prescribed as significant.

(3) The State Water Resources Director may require the applicant to hold a public forum to explain the planned activity to the general public prior to the period specified for objections to be made under subsection (4).

(4) Any person making any objection against an application for a licence shall do so in writing and shall –

(a) state the reasons for the objection;

(b) lodge such objection with the State Water Resources Director within three weeks from the date of publication of the notice under subsection (1).

(5) The State Water Resources Director shall notify the applicant in writing of the objection and the reasons for them, whereupon the applicant shall, within twenty one days from the date of receipt of the notification, make a written response to the State Water Resources Director to the objection.

Approval

47. (1) The State Council may approve or reject the application after having taken all information, objections and comments into account.

(2) A final decision, being approval or rejection of the application, shall be made in writing no later than three months, or six months where section 46 applies, after the State Water Resources Director has received a complete application.

(3) In the event the application is rejected, the applicant shall be informed of the reason for the rejection and his right of appeal, if any.

Contents of a licence

48. (1) The State Council may issue a licence subject to such terms and conditions as the State Council may determine, including –

(a) any special measures to be taken to promote the efficient use of water resources and to protect and improve the environment; and

(b) an adequate emergency plan, including measures in the event of malfunction of the activity or works with impact on or threat to the water resources, environment or public health.

(2) A licence may be issued for a maximum period not exceeding five years.

(3) In determining the operating period of a licence, the State Council shall consider the nature, scale and duration and the likely impact on any water resource of the proposed activity or works.

(4) A licensee may apply for an extension of his licence by making an application no later than six months before the expiry of the existing licence.

(5) The State Council may grant an extension of a licence for such a period and subject to such terms and conditions as it may think fit.

Security

49. The State Council may require an applicant to deposit a security to ensure compliance of the terms and conditions of the licence.

Register of licences

50. (1) The State Water Resources Director shall keep a register of all licences issued by the State Council.

(2) The register shall contain details of the licences including -

(a) any exemption order to licensing requirements;

(b) any special condition specified in the licence;

(c) any imposition of additional conditions or variation or revocation of conditions;

(d) any written notice by the licensee surrendering the licence;

(f) any revocation of the licence;

(g) any non-renewal of the licence; and

(h) any written approval from the State Council to the assignment, sub-licensing or transfer of the licence.

(3) The register shall be accessible to the public during office hours.

Obligations of licensees

51. (1) Every licensee shall comply with the terms and conditions of the licence and any conditions stipulated under this Act.

(2) The State Water Resources Director may require the licensee, or where the licensee is a body corporate, the director or manager of such licensee, to certify in the annual report filed with the State Council that –

(a) the licensee is in compliance with the conditions in the licence and the provisions of this Act and that to the best of the licensee's, or in the case of a body corporate, the director's or manager's knowledge and belief that the report does not contain any untrue statement of a material fact or any omission which would render any part of the report misleading; and

(b) there are sufficient internal controls established for which the licensee, or in the case of a body corporate, the director or manager, is responsible to ensure that all material information in relation to compliance by the licensee with the licence conditions or the provisions of this Act is made known to the director or manager certifying the report.

Variation of conditions in licences

52. (1) The State Council may, where there has been a significant change of circumstances or other sufficient cause, revoke or vary any condition attached to a licence or impose new conditions thereto whether in addition to or in substitution for existing conditions by way of written notice to the licensee.

(2) The change of circumstances referred to in subsection (1) shall include –

(a) new information is obtained indicating adverse effects on resources or the environment;

(b) change in legislation laying down new standards and requirements;

(c) new technology has become available which allows better control and mitigation of environmental pollution; or

(d) the operational safety of the licenced activity or works requires alternative methods and technology to be used.

Revocation

53. (1) The State Council may revoke the licence where –

(a) the licensee has made a false or misleading statement in the application or the materials, information or plan submitted in support of the application;

(b) any of the terms or conditions imposed in the licence has been breached;

(c) the licensee has failed to comply with any of the provisions of this Act or any requirements or directives made under this Act;

(d) the licensee has not paid the fee or charges imposed under this Act;

(e) the licensee is insolvent or suspends payments to or enters into a composition or arrangement with its creditors such that in the opinion of the State Water Resources Director the licensee's operations may be prejudiced, or facts or circumstances exist which in the opinion of the State Water Resources Director are likely to lead to such events;

(f) the licence has not, without reasonable cause or explanation, been used for a consecutive period of six months within the period of the licence; or

(g) the licensed activity or works is for an unlawful purpose or is contrary to any court order or is prejudicial to public interest.

(2) Where the State Council proposes to revoke a licence, it shall by written notice inform the licensee of the proposed revocation, setting out the reasons thereof and requiring the licensee to respond within a specified period of time, stating his reasons as to why the licence should not be revoked.

(3) Upon consideration of any statement by the licensee, the State Council may –

(a) revoke the licence by way of written notice, setting out in the notice the reasons for the revocation; or

(b) decide not to proceed with the revocation.

(4) No person whose licence is revoked shall have the right to compensation for any damage or loss caused by such revocation.

Termination

54. A licence is deemed terminated if –

(a) the period for which the licence is issued has expired;

(b) the licensee has given up the rights granted in the licence;

(c) the licence has been revoked under section 53;

(d) the licensee is wound up or is declared a bankrupt; or

(e) there is a final court order prohibiting performance of the licensed activity or works.

Establishment of Appeal Tribunal

55. There shall be established an Appeal Tribunal for the purpose of hearing an appeal in respect of the following matters:

(a) a refusal to grant a licence under this Act;

(b) the imposition or variation of any condition in respect of a licence; and

(c) the revocation of a licence.

Members of the Appeal Tribunal

56. (1)The Appeal Tribunal shall consist of the following members to be appointed by the State Authority –

(a) a Chairman, who shall be a person who is or was a member of the Judicial and Legal Service of the Federation or a practising advocate and solicitor of the High Court for at least ten years; and

(b) at least four other members, one of whom shall be a person from the private sector with experience in the field of environmental conservation and protection.

(2) No member, officer or staff of the State Council shall be eligible for appointment as a member of the Appeal Tribunal.

(3) A member of the Appeal Tribunal shall hold office for a term not exceeding two years and be eligible for reappointment upon expiry of his term and office.

(4) Members of the Appeal Tribunal shall be paid such allowances as may be determined by the State Authority.

(5) The State Authority may by written notice revoke the appointment of any member of the Appeal Tribunal.

Procedure of Appeal Tribunal

57. The Appeal Tribunal shall decide its own procedures and publish it in the Gazette.

Secretariat

58. The Appeal Tribunal shall be assisted by a Secretariat constituting a Secretary and such number of staff as the State Authority may appoint.

Proceedings

59. (1) Every appeal to the Appeal Tribunal shall be heard by the Chairman and two other members of the Appeal Tribunal.

(2) In the absence of the Chairman, the members of the Appeal Tribunal present at the proceeding shall elect one member among themselves to act as chairman for that particular proceeding.

(4) No member shall attend and participate at a proceeding of the Appeal Tribunal where the particular matter on appeal relates to a matter in which he has an interest, and he shall promptly disclose his interest to the Chairman.

Appeal

60. (1) Any person aggrieved by –

(a) a refusal to grant a licence under this Act;

(b) the imposition or variation of any condition in respect of a licence; or

(c) the revocation of a licence

may appeal to the Appeal Tribunal.

(2) An appeal to the Appeal Tribunal shall be made by filing a notice of appeal within twenty one days from the date of the decision of the State Council.

Appeal not a stay of action

61. An application for appeal does not operate as a stay except where an order of stay has been granted by the Appeal Tribunal on such terms as it thinks fit.

Powers of Appeal Tribunal

62. The Appeal Tribunal shall have the powers of a subordinate court with regard to summoning of witnesses to attend before it, hearing evidence on oath or affirmation, and requiring and ensuring production of any information, document or other thing in a person's possession or under his control.

Decisions of Appeal Tribunal final

63. A decision of the Appeal Tribunal shall be made by a majority of members. The decision shall be final and binding on the parties and not subjected to further appeal.

PART XI

ENFORCEMENT

Authorised officers

64. (1) The powers of enforcement under this Act shall be exercised by an authorised officer.

(2) For the purposes of this Act, an authorised officer shall mean –

(a) the State Water Resources Director and any other officer of the State Council authorised in writing by the State Water Resources Director; and

(b) any officer of a Government entity authorised in writing by the State Water Resources Director to exercise all or such part of the powers under this Part as specified by him.

(3) An authorised officer shall be deemed to be a public servant within the meaning of the Penal Code *[Act 574]*.

(4) An authorised officer investigating the commission of an offence under this Act may exercise the powers of police investigation under the Criminal Procedure Code *[Act 593]* except the power to arrest without a warrant.

Power to enter

65. An authorised officer may enter any premise for the following purposes -

(a) to monitor any activity regulated by this Act;

(b) to carry out any survey or data collection activity in accordance with this Act; or

(c) to take meter readings or measurements or samples of any matter for the purposes of this Act.

Power to enter, investigate and seize

66. (1) Where an authorised officer has reasonable cause to believe that an offence under this Act has been committed, he may, without a warrant, enter or access any premise, vessel or vehicle to search for, inspect, take copies of or seize any equipment, computer, document, computerized data, material or article, which he believes to be necessary for the conduct of an investigation into such offence.

(2) If by reason of its nature, size or amount, it is not practicable to remove any equipment, computer, document, computerized data, material or article from or by access through the premise, vessel or vehicle, the authorised officer may seal such equipment, computer, document, computerized data, material or article by any means whatsoever.

(3) The authorised officer shall prepare a list of any equipment, computer, document, computerized data, material or article seized, which shall be signed by him, and a copy of which shall be delivered to the owner or occupier of the premise, vessel or vehicle or his employee or agent.

(4) Where entry or access as referred to in subsection (1) is obstructed in any manner, the authorised officer may with a warrant issued by a Magistrate -

(a) break open any door of the premise, vessel or vehicle and enter therein;

(b) forcibly enter the place and any part thereof;

(c) remove by force any obstruction to entry, search, seizure and removal as he is empowered to effect under subsection (1); and

(d) break open any receptacle in order to inspect its contents.

(5) If it appears to a Magistrate, upon information on oath and after such inquiry as he considers it necessary, that there is a reasonable cause to suspect that in any premise, vessel, or vehicle there is concealed or deposited any equipment, computer, document, computerized data, material or article that is reasonably believed to furnish evidence of the commission of an offence under this Act, the Magistrate may issue a warrant authorising any authorised officer to whom it is directed, by day or night, with or without assistance, to enter the premise, vessel or vehicle and there search for and seize any such equipment, computer, document, computerized data, material or article.

(6) If it appears to an authorised officer that there is reasonable cause to suspect that in any premise, vessel or vehicle there is concealed or deposited any equipment, computer, document, computerized data, material or article that is reasonably believed to furnish evidence of the commission of an offence under this Act and he has reasonable grounds for believing the equipment, computer, document, computerized data, material or article is likely to be removed or destroyed, he may exercise the powers mentioned in subsection (4) without a warrant.

Evidence of authority

67. In exercising his powers under sections 65 and 66, an authorised officer shall produce, on demand, evidence of his authority to be on the premise, vessel or vehicle.

Directive to cease activity or works

68. The State Water Resources Director may, when there is a significant and immediate threat or risk to the quantity, quality or flow of water in a water resource or a serious threat of pollution or threat or risk to a water resource from any activity or works, direct in writing the

owner or occupier of the premise on which the activity or works is being carried out or the person responsible for or having control of such activity or works to –

(a) cease carrying out or refrain from commencing the activity or works;

(b) carry out such measures including demolition, restoration, remedial or regeneration work as may be specified in the directive; and

(c) take such other action as the State Water Resources Director may consider necessary to protect and prevent further pollution or harm to the water resources and environment or any threat of such pollution or harm.

Order to impound

69. (1) Where the State Water Resources Director is satisfied that any person has removed any resources or deposited any material in any water resources in contravention of this Act, he may issue an impounding order in respect of –

(a) the whole or any part of the resource or material removed or deposited; and

(b) any plant or equipment or other thing used in the removal or deposit of such resource or material.

(2) An impounding order issued under subsection (1) shall take effect immediately, unless otherwise stated in the order, and may contain such conditions as are specified by the State Water Resources Director.

(3) The State Water Resources Director may, in writing, vary or revoke the order issued under subsection (1), or any condition imposed in it.

(4) Unless earlier revoked by the State Water Resources Director, an impounding order shall remain in force for a period of twelve months from the date it was issued or until the final disposal of any proceedings instituted in respect of any offence under this Act.

(5) Anything impounded in exercise of the powers under this section shall be liable to forfeiture. An order for forfeiture of anything impounded may be made by the court if it is proved to the satisfaction of the court that the resources, material, plant, equipment or thing was the subject matter of or was used in the commission of an offence under this Act notwithstanding that no person may have been convicted of such offence.

(6) Any resources, material, plant, equipment or thing ordered to be forfeited under subsection (5) may be disposed of by the State Council and the proceeds of such disposal shall be deposited into the Fund.

(7) Any person who causes any resources, material, plant, equipment or thing that is the subject of an impounding order under this section to be used, moved, sold or otherwise disposed off or dealt with in contravention of such order, commits an offence, and shall, on conviction be liable to a fine not exceeding three hundred thousand ringgit or to imprisonment for a term not exceeding three years or to both.

Power to take remedial action

70. (1) Where any order or directive made under this Act is not complied with by the person or Government entity to whom it is addressed, the State Water Resources Director or any person authorised by him may, for the purpose of effecting the order or directive –

(a) enter the site of the activity or works, and to the extent necessary to gain access to the activity or works, enter the adjoining premise;

(b) carry out or cause to be carried out the measures or work specified in the order or directive;

(c) take such other action as is necessary or expedient to effect the order or directive.

(2) The amount of any cost or expenses incurred in carrying out the remedial action pursuant to subsection (1) is recoverable as a debt due to the State Council from the person or Government entity responsible for the non-compliance or contravention of the directive.

(3) A certificate from the State Water Resources Director stating that –

(a) that the person or Government entity named in the certificate is responsible for the non-compliance or contravention of the order or directive shall be prima facie evidence for the purposes of any proceeding under this section; and

(b) the costs and expenses incurred as stated in the certificate shall be conclusive proof of the sums due and shall not be subject to appeal in any court.

Disconnection of supply of water

71. Where the State Water Resources Director determines that an offence has been or is likely to be committed under this Act, he may, upon giving not less than twenty four hours notice, cause the supply of untreated water from any water resource to be disconnected from the premise and the supply of water shall not be reconnected until the State Water Resources Director, at his discretion, gives permission.

Examination of persons acquainted with the case

72. (1) An authorised officer conducting an investigation into an offence under this Act may, in writing, require the attendance before him of any person who appears to be acquainted with the facts and circumstances of the case.

(2) Where any person fails to attend as required under subsection (1), his failure may be reported to a Magistrate who shall issue a warrant to secure the attendance of such person.

(3) A person examined by an authorised officer shall be legally bound to state the truth and, subject to subsection (4), answer all questions relating to the case.

(4) A person may refuse to answer any question the answer to which will tend to expose him to a criminal charge, penalty or forfeiture.

(5) A person question under this section shall be informed of his rights and obligations specified under subsections (3) and (4) before the questioning begins.

(6) A statement made by any person under this section shall, where possible, be reduced into writing and signed by the person making it or affixed with his thumb print, as the case may be, after it has been read to him in the language in which he made it, and after he has been given the opportunity to make any corrections as he may wish.

Admissibility of statements in evidence

73. (1) If any person is charged with an offence under this Act, any statement made by him to or in the hearing of an authorised officer shall be admissible in evidence at his trial, and if such person tenders himself as a witness, any of the said statement may be used in cross examination and for purposes of impeaching his credit.

(2) A statement referred to in subsection (1) includes a statement made at any time, whether or not it is a confession, an oral or written statement, statements made before or after the person is arrested, whether or not the statement is made in the course of investigation, and whether or not it is wholly or partly in answer to questions.

(3) No statement referred to in subsection (2) shall be admissible or used in evidence if –

(a) the statement was made by way of an inducement, threat or promise; and

(b) in the case of a statement made by the person after his arrest, he was not cautioned with the following words or words to the like effect: "It is my duty to warn you that you are not obliged to say anything or to answer any question, but anything you say, whether in answer to a question or not, may be given in evidence and held against you".

(4) A statement made by a person before there is time to caution him shall not be rendered inadmissible in evidence solely by reason of his not having been cautioned if he is cautioned as soon as possible after the statement was made.

Installation and operation

74. (1) The State Water Resources Director may require any owner or occupier of any premise or any person taking, using, discharging into or interfering with the flow of water or any resources to -

(a) install and operate any equipment including equipment for control, sampling, transmitting or warning of a type approved by the State Water Resources Director;

(b) install and operate any meter, measuring or recording device of a type approved by the State Water Resources Director;

(c) submit, at regular intervals, such information and data as directed in writing by the State Water Resources Director, pertaining to any works or activity; and

(d) appoint, with the approval of the State Water Resources Director, any external auditor or independent person to inspect, verify, calibrate and certify to the State Water Resources Director that the equipment, measurements and recording under paragraphs (a) and (b) are conducted in accordance with prescribed standards and the information provided under paragraph (c) accurately reflects the situation it describes.

(2) Any person who, without permission of the State Water Resources Director tampers, adjusts, alters or interferes with the operations of any equipment, meter or other sampling or recording device which has been installed or cause to be installed by the State Council commits an offence and shall on conviction, be liable to a fine not exceeding one hundred thousand ringgit or to imprisonment for a term not exceeding one year or to both.

Furnishing of information

75. (1)The State Water Resources Director may by notice in writing require any person or the owner or occupier of any premise as the case may be, to furnish within such period such information as may be specified in the notice.

(2) Any person, including any external auditor or independent person appointed under section 74(1)(d), who fails to furnish such information as is requested pursuant to subsection (1) or gives any answer or information that is false or misleading in any material respect, commits an offence and shall upon conviction be liable to a fine not exceeding fifty thousand ringgit.

Power to arrest

76. Any officer authorised in writing by the State Council including a police officer not below the rank of Inspector may arrest, without warrant, any person found to be committing an offence under the provisions of this Act and shall forthwith bring such person before any duly authorised officer designated, in writing, for such purpose by the State Council who may, if so empowered, compound the offence pursuant to the provisions of this Act or who may order the person to be produced before a Magistrate.

Prosecution

77. (1) No prosecution for an offence under this Act shall be instituted except by or with the written permission of the Public Prosecutor.

(2) Subject to the provisions of the Criminal Procedure Code *[F.M.S.Cap. 6]* the State Water Resources Director or any officer authorised by him shall be competent to conduct a prosecution for any offence under this Act or any regulation made thereunder before any court.

PART XII

OFFENCES AND PENALTIES

Offences in relation to licences

78. Any person who without licence carries out any activity or works that requires a licence under this Act or who is in breach of any condition, requirement or restriction imposed in relation to any such licence commits an offence and shall, on conviction, be liable, where no penalty is expressly provided, to a fine not exceeding three hundred thousand ringgit or to imprisonment for a term not exceeding three years, or to both.

Offences in relation to directives or orders

79. Any person who fails to comply with any directive or order lawfully given under this Act commits an offence and shall on conviction, be liable, where no penalty is expressly provided, to a fine not exceeding one hundred thousand ringgit or to imprisonment for a term not exceeding one year, or to both.

Confiscation of monetary benefits

80. Where a person is convicted of an offence under this Act and it is proved to the satisfaction of the court that as a result of the commission of the offence, monetary benefits accrued to the offender, the court may order the offender to pay in addition to the fine for the offence an additional amount equivalent to the amount of the monetary benefit.

Obstructing authorised officer

81. Any person who obstructs or impedes an authorised officer in the lawful exercise of his powers under this Act commits an offence and shall, on conviction, be liable to a fine not exceeding one hundred thousand ringgit or to imprisonment for a term not exceeding one year, or to both.

Breaking and removing any seal

82. Any person who breaks or removes any seal placed by an authorised officer pursuant to section 66(2) commits an offence and shall, on conviction, be liable to a fine not exceeding one hundred thousand ringgit or to imprisonment for a term not exceeding one year, or to both.

Offences committed by a body corporate

83. Where a body corporate commits an offence under this Act or any of its subsidiary legislation, any person who at the time of the commission of the offence was a chief executive officer, director, manager or other similar officer of the body corporate or was purporting to act in any such capacity or was in any manner or to any extent responsible for the management of any of the affairs of the body corporate or was assisting in such management -

(a) may be charged severally or jointly in the same proceedings with the body corporate;

(b) where the body corporate is found guilty of the offence, shall be deemed to be guilty of that offence unless, having regard to the nature of his functions in that capacity and to all circumstances, he proves –

(i) that the offence was committed without his knowledge, consent or connivance; and

(ii) that he had taken all reasonable precautions and exercised all such diligence to prevent the commission of the offence.

Act or omission of agent or employee

84. Every person shall be liable for the act or omission of his agent or employee acting in the course of his employment, where such act or omission constitutes an offence under this Act, in the same manner and to the same extent as if such act or omission were done by him provided that nothing in this section shall absolve the agent or employee from liability.

General offence

85. Any person who in any way, contravenes or fails to comply with any provision under the Act or any of its subsidiary legislation, where no penalty is specifically provided in relation thereto, commits an offence and shall, on conviction, be liable to a fine not exceeding one hundred thousand ringgit or to imprisonment for a term not exceeding one year, or to both.

Continuing offence

86. Where a person commits an offence under this Act and the offence is continued, such person shall, in addition to the penalty specified for that particular offence, be liable, where no further fine is expressly provided, to a further fine not exceeding ten thousand ringgit a day for every day the offence is continued.

Compounding of offences

87. (1) The State Council may prescribe any offence under this Act or its subsidiary legislation as an offence which may be compounded.

(2) The State Water Resources Director with the consent of the Public Prosecutor, may at any time before a charge is instituted, compound any of the offences prescribed under subsection (1) by accepting from the person reasonably suspected of having committed the offence a sum of money not exceeding fifty per centum of the maximum fine to which the person would have been liable to if he had been convicted of the offence, within such time as may be specified in his written offer.

(3) An offer made under subsection (2) may be made at any time after the offence has been committed but before any prosecution for it has been instituted, and where the amount specified in the offer is not paid within the time specified in the offer, or such extended time as the State Water Resources Director may grant, prosecution for the offence may be instituted at any time after that against the person to whom the offer was made.

(4) Where an offer has been compounded under subsection (2), no prosecution shall be instituted in respect of the offence against the person to whom the offer to compound was made, and any document, equipment, material or thing seized in connection with the offence may be released by the State Water Resources Director subject to such terms and conditions as he thinks fit.

(5) All sums of money accepted under subsection (2) shall be paid into the Fund.

PART XIII

MISCELLANEOUS

Right of access to land

88. All officers of the State Council shall, at all reasonable times, have free access to any land for the purpose of implementing the provisions of this Act or any regulations made hereunder.

Service of document or notice

89. (1) Service of a document on any person shall be effected –

(a) by delivering the document to that person or by delivering the document to an adult at the premise of the last known address;

(b) by leaving the document at the last known address or place of business of that person in an envelope addressed to that person; or

(c) by forwarding the document by post in a prepaid letter addressed to that person at his last known address or place of business.

(2) A document required to be served on the owner or occupier of any premise shall be deemed to be properly addressed by the description of the "Owner" or "Occupier" of such premises without further name or description and may be served by delivering the document or notice to an adult person on the premise or, if there is no such person on the premise to whom the document or notice can with reasonable diligence be delivered, by fixing the document or notice on some conspicuous part of the premise.

Protection against suit and legal proceedings

90. No action shall lie or prosecution shall be brought, instituted or maintained in any court against -

(a) the State Council;

(b) any member of the State Council;

(c) the State Water Resources Director;

(d) any authorised officer; and

(e) any other person for or on account of or in respect of any act done or purported to be done by him under the order, direction or instruction of the State Council, State Water Resources Director or authorised officer,

if the act was done in good faith and in a reasonable belief that it was necessary for the purpose intended to be served by it and for the carrying into effect the provisions of this Act.

Power of State Water Resources Director to prescribe forms

91. The State Water Resources Director may, in consultation with the Director General, prescribe forms for any book, instrument or notice required under this Act.

Regulations by State Council

92. (1) The State Council may, with the approval of the State Authority, by notification in the Gazette, make such regulations as may be expedient or necessary for the better carrying out of the provisions of this Act or for prescribing anything that may be, or is required to be, prescribed under this Act.

(2) The State Council may, for the purposes of ensuring uniformity of laws among States, consult the Minister on any regulations made under this Act.

(3) Without prejudice to the generality of subsection (1), regulations may be made in respect of the following -

(a) the declaration of protected areas and the management of such areas;

(b) the collection, remission, rebate or deferment of payment of any sum, fees or charges required or authorised to be done under this Act or any regulations made thereunder;

(c) sustainable development, conservation and use of any water resource;

(d) the implementation of appropriate measures and accreditation including national standards for the measurement, classification and categorisation of quantity, quality or other characteristics of water, water resources or other resources;

(e) the allocation and categorisation of priorities and rights to water resources;

(f) the implementation of appropriate measures including measures approved by the National Council to mitigate the impact of climate change;

(g) the implementation of the management plan for the State;

(h) the drawing up and implementation of integrated river basin management plan for any river basin;

(i) methods, procedures, terms and conditions including payments, charges and fees for licences under this Act;

(j) implementation of appropriate standards including national standards for the management, regulation and control of the construction, operations and maintenance of structures, dams, barrages, tidal gates, weirs on water resources;

(k) the management, control and regulation of any abstraction, extraction, diversion of any water or interference, discharge and return of any water, substance or waste into water resources;

(l) mitigation of the impact of drainage from agricultural or farming activities;

(m) the implementation of appropriate standards including national standards and requirements for recycling of water;

(n) the implementation of the national manual, standards and guidelines for the design, construction, management, maintenance and control of sustainable drainage systems;

(o) the management, regulation and control of any activity or works on water resources;

(p) declaration of problem soil areas and measures to manage such areas;

(q) the implementation of appropriate measures, including those proposed by the Director General, for the safety and health of the public from water hazards and disasters;

(r) the implementation of any plans, standards, blueprints, classification, specifications, guidelines and measures recommended by the Director General related to integrated water resources management including integrated river basin management, integrated coastal zone management and integrated shoreline management;

(s) the control and regulation of transfer of water between river basins within a State or between two or more States;

(t) the control and regulation of recreational activities on water bodies;

(u) the control and regulation of vessels on rivers and water bodies; and

(v) the offences which may be compounded and the procedure for compounding of such offences.

(4) Regulations made under this section may prescribe any act or omission in contravention of the regulations to be an offence and may prescribe penalties of a fine not exceeding one hundred thousand ringgit or imprisonment for a term not exceeding one year or to both.

Regulations by Minister

93. (1) The Minister may, by notification in the Gazette, make such regulations as may be expedient or necessary for the better carrying out of the provisions of this Act or for prescribing anything that may be, or is required to be, prescribed under this Act.

(2) The Minister may, for the purposes of ensuring uniformity of laws among States, consult the National Council on any regulations made under this Act.

(3) Without prejudice to the generality of subsection (1), regulations may be made in respect of the following -

(a) the establishment of national registers for water resources including a national register of river basins;

(b) the establishment of national standards for the designation by States of protected areas and the management of such areas;

(c) the implementation of sustainable development, conservation, management and use of water resources and their catchments which occur in more than one State or are part of an international boundary;

(d) the regulation of any sale or transfer of water to any other country;

(e) the establishment of national standards, conditions and procedures for the transfer of water between any two States;

(f) the establishment of national standards for the measurement, classification, categorisation and accreditation of the quantity, quality or other characteristics of water resources;

(g) the establishment of appropriate measures including measures approved by the National Council to mitigate the impact of climate change;

(h) the control and regulation of any activity that is aimed at the modification of atmospheric precipitation including cloud seeding;

(i) the management, regulation and control of the construction, operations and maintenance of structures, dams, barrages, tidal gates, weirs on water resources;

(j) the establishment of national standards and requirements for recycling of water;

(k) the establishment of a national manual including standards, procedures and guidelines for the design, construction, management, maintenance and control of sustainable drainage systems;

(l) the establishment of national standards, conditions, procedures and guidelines for the management, regulation and control of any activity or works on water resources and their catchments;

(m) the establishment of plans, standards, blueprints, classification, specifications, guidelines and measures related to integrated water resources management, integrated river basin management, integrated lake basin management, integrated coastal zone management and integrated shoreline management;

(n) the establishment of a manual for the identification and management of problem soil areas;

(o) the establishment of measures to prevent any nuisance to the public or for the protection of the safety and health of the public from any hazard from water resources;

(p) the submission of reports, data, accounts, statistics and other information by any person or Government entity including establishment of a national census of water resources and making the information available in the public domain;

(q) the adoption and implementation of international treaties and conventions;

(r) the establishment of procedures and conditions for determination of disputes, inquiries, appeals and mediation on water resources; and

(s) the establishment of appropriate measures for the safety and health of the public from water hazards and disasters;

(4) The State Council may adopt any regulation made under this section as a State regulation.

(5) Regulations made under this section may prescribe any act or omission in contravention of the regulations to be an offence and may prescribe penalties of a fine not exceeding two hundred thousand ringgit or imprisonment for a term not exceeding two years or to both.

PART XIV
REPEAL AND SAVINGS

Repeal and savings

94.(1) Upon coming into force of this Act in any State, the State may amend or repeal any Enactment relating to water resources or rivers within the State.

(2) Any regulation, rule, order, declaration, notice or notification made, given or issued under the terms of the Enactment amended or repealed under subsection (1), before the commencement of this Act shall, in so far as it is not inconsistent with this Act, continue in force until amended, revoked or replaced by a regulation, rule, order, declaration, notice or notification issued under the provisions of this Act.

(3) Any person who, immediately before the commencement of this Act, was holding any office to which appointment may be made under any provision of this Act, shall continue in that office, and shall be deemed for the purposes of this Act, to have been so appointed.

(4) Any person who was prior to the coming into force of this Act carrying on any activity which requires a licence or approval under this Act shall within six months of the coming into force of this Act or such other period as the State Council may decide, apply for the requisite licence or approval and shall pending such licence being granted, carry on such activity subject to such conditions or directives as the State Council thinks fit.

Power of State Authority to make additional transitional provisions

95. The State Authority may, by regulation, make such provision as it considers necessary or expedient for the purpose of removing any difficulty occasioned by the coming into force of this Act, and such regulations may be made so as to have effect from the commencement of this Act.

FIRST SCHEDULE

[Section 4]

Meetings of the National Council

(1) (1) The National Council shall meet at such times and places as the Chairman may determine but at least once every 12 months.

(2) The Chairman shall preside at a meeting of the National Council or in the absence of the Chairman, the Minister with responsibility for water resources.

(3) The Chairman who presides at a meeting of the National Council and a member from each State shall constitute a quorum at any meeting of the National Council.

(4) Subject to subparagraph (5), the Chairman who presides at a meeting of the National Council and every member present at such meeting shall be entitled to one vote.

(5) For the avoidance of doubt, in all meetings of the National Council the vote of the Chairman who presides at a meeting of the National Council shall be counted as one.

(6) Decisions of the National Council shall be made by unanimous vote of members present and entitled to vote at the relevant meeting.

Council may invite others to meetings

2. The National Council may invite any other person to attend any meeting or discussion of the National Council for the purpose of advising the National Council on any matter under discussion, but any person so attending shall have no right to vote at the meeting or discussion.

Live participation by video links, *etc.*

3. The Chairman may authorize a meeting by, or a member or person to participate in any meeting of the National Council by, live video, television, internet or other appropriate communication or multimedia links.

Minutes

4. (1) The National Council shall cause minutes of all its meetings to be maintained and kept in proper form.

(2) Any minutes of a meeting of the National Council shall, if duly signed by the Chairman who presided at such meeting, be proof of such proceedings.

(3) Every meeting of the National Council in respect of the proceedings of which minutes have been made in accordance with subparagraphs (1) and (2) shall be deemed to have been duly convened and held and all members thereat to have been duly qualified to act.

Allowances

5. There may be paid to the members of the National Council such allowances and expenses as the Minister may determine.

SECOND SCHEDULE

[Section 8]

Appointment, revocation and resignation

1. (1) The appointment of a member of the State Council under paragraph 8(1)(h) of the Act shall be for such duration and on such terms as the State Authority may determine.

(2) A member of the State Council appointed under paragraph 8(1)(h) of the Act shall, subject to such terms as may be specified in his instrument of appointment, hold office for a term not exceeding two years and is eligible for reappointment for a maximum period of three consecutive terms.

(3) The appointment of a member under paragraph 8(1)(h) of the Act may at any time be revoked by the State Authority without assigning any reason for the revocation.

(4) A member appointed under paragraph 8(1)(h) of the Act may at any time resign his office by letter addressed to the State Authority.

Vacation of office

2. The office of a member of the State Council appointed under paragraph 8(1)(h) of the Act is vacated -

(a) if he dies;

(b) if there has been proved against him, or he has been convicted on a charge in respect of –

(i) an offence involving fraud, dishonesty or moral turpitude;

(ii) an offence under any law relating to corruption or under this Act;

(iii) any other offence punishable with imprisonment (in itself only or in addition to or in lieu of a fine) for more than two years;

(c) if he becomes a bankrupt;

(d) if he is of unsound mind or is otherwise incapable of discharging his duties;

(e) if he absents himself from three consecutive meetings of the State Council without leave of the Chairman;

(f) if his resignation is accepted by the State Authority; or

(g) if his appointment is revoked by the State Authority.

Meetings of the State Council

3. (1) The State Council shall meet at such times and places as the Chairman may determine but not less than two times a year.

(2) The Chairman shall preside at a meeting of the State Council or in the absence of the Chairman, the Vice Chairman.

(3) The Chairman who presides at a meeting of the State Council and not less than six members shall constitute a quorum at any meeting of the State Council.

(4) Subject to subparagraph (5), the Chairman who presides at a meeting of the State Council and every member present at such meeting shall be entitled to one vote.

(5) For the avoidance of doubt, in all meetings of the State Council the vote of the Chairman who presides at a meeting of the State Council shall be counted as one.

(6) Decisions of the State Council shall be made by unanimous vote of members present and entitled to vote at the relevant meeting.

State Council may invite others to meetings

4. The State Council may invite any other person to attend any meeting or discussion of the State Council for the purpose of advising the State Council on any matter under discussion, but any person so attending shall have no right to vote at the meeting or discussion.

Resolution without meetings

5. (1) A resolution is taken to have been passed at a meeting of the State Council if –

(a) all members of the State Council have been informed of the proposed resolution, or reasonable efforts have been made to inform all members of the State Council of the proposed resolution; and

(b) without meeting, all of the members of the State Council indicate agreement with the resolution in accordance with the method determined by the State Council under subparagraph (2).

(2) Subparagraph (1) applies only if the State Council -

(a) decides that the subparagraph applies; and

(b) decides the method by which members of the State Council are to indicate agreement with the resolution.

State Council subject to directions of the State Authority

6. The State Council shall be subject to and act in accordance with any direction given to the State Council by the State Authority.

Disclosure of interest

7. (1) Any member of the State Council who has or acquires a direct or indirect interest by himself, through a member of his family or his associates in relation to any matter under discussion or deliberation by the State Council shall disclose to the chairman who presides at the meeting of the State Council the fact of his interest and the nature of that interest.

(2) A disclosure under subparagraph (1) shall be recorded in the minutes of the meeting of the State Council in which the matter is discussed or deliberated and, after the disclosure, the member –

(a) shall not be present in any discussion or deliberation, or decision of the State Council, when the matter is discussed or deliberated or decided upon; and

(b) shall be disregarded for the purpose of constituting a quorum of the State Council when the matter is discussed or deliberated or decided upon.

(3) For the purpose of this paragraph –

(a) "a member of his family" in relation to a member of a State Council includes –

(i) his spouse;

(ii) his parent including a parent of his spouse;

(iii) his child including an adopted child or stepchild;

(iv) his brother, or sister including a brother or sister of his spouse; and

(v) a spouse of his child, brother or sister.

(b) "associate", in relation to a member of a State Council means -

(i) a person who is a nominee or an employee of the member;

(ii) a firm of which the member or any nominee of his is a partner;

(iii) a partner of the member;

(iv) a trustee of a trust under which the member or a member of his family is a beneficiary; or

(v) any corporation within the meaning of the Companies Act 1965 [*Act 125*], of which the member or any nominee of his or a member of the member's family is a director or has a substantial shareholding in the corporation.

Live participation by video links, *etc.*

8. The Chairman may authorize a meeting by, or a member or person to participate in any meeting of the State Council by, live video, television, internet or other appropriate communication or multimedia links.

Minutes

9. (1) The State Council shall cause minutes of all its meetings to be maintained and kept in proper form.

(2) Any minutes of a meeting of the State Council shall, if duly signed by the Chairman who presided at such meeting, be proof of such proceedings.

(3) Every meeting of the State Council in respect of the proceedings of which minutes have been made in accordance with subparagraphs (1) and (2) shall be deemed to have been duly convened and held and all members thereat to have been duly qualified to act.

Common seal

10. (1) The State Council shall have a common seal which shall bear such device as the State Council shall approve and such seal may be broken, changed, altered or made anew as the State Council State Council may think fit.

(2) Until a seal is provided by the State Council, a stamp bearing the words "State Water Resources Council" with the name of the State included in those words, may be used and shall be deemed to be the common seal of the State Council.

(3) The common seal shall be kept in the custody of the State Water Resources Director or such officer of the State Council as may be authorised by the State Water Resources Director in

writing, and shall be authenticated by the State Water Resources Director or such authorised officer; and all deeds, documents or other instruments purporting to be sealed with that seal, authenticated as specified in this subparagraph, shall, until the contrary is proved, be deemed to have been validly executed.

(4) Notwithstanding subparagraph (3), any document or instrument which if executed by a person who, not being a body corporate, would not be required to be under seal may in like manner be executed by the State Council; and any such document or instrument may be executed on behalf of the State Council by any officer or servant of the State Council generally or specifically authorised by the State Water Resources Director in that behalf.

(5) The common seal of the State Council shall be officially and judicially noticed.

Validity of acts and proceedings

11. No act or omission done or proceedings taken by the State Council under this Act shall be questioned or invalidated on the ground of -

(a) any vacancy in the membership of, or any defect in the constitution of, the State Council;

(b) a contravention by any member of the State Council of the provisions of paragraph 7;

(c) the presence or participation of a member or person not entitled to be present or participate; and

(d) any omission, defect or an irregularity not affecting the merit of the case.

Remuneration or allowance

12. There may be paid to the members of the State Council such remuneration or allowances as the State Authority may determine.

THIRD SCHEDULE

[Section 9]

Appointment, revocation and resignation

1. (1) A member of a committee shall hold office for such duration and on such terms as may be specified in his letter of appointment and is eligible for reappointment.

(2) The appointment of a member under subsection 9(3) of the Act may at any time be revoked by the State Council without assigning any reason for the revocation.

(3) A member appointed under subsection 9(3) of the Act may at any time resign his office by letter addressed to the State Council.

(4) The State Council may at any time revoke the establishment or alter the constitution of a committee.

Meetings of the committee

2. (1) The committee shall meet at such times and places as the chairman may determine.

(2) The chairman shall preside at a meeting of the committee or in the absence of the chairman, the vice chairman.

(3) The chairman who presides at a meeting of the committee and not less than three other members shall constitute a quorum at any meeting of the committee.

(4) Subject to subparagraph (5), the chairman who presides at a meeting of the committee and every member present at such meeting shall be entitled to one vote.

(5) For the avoidance of doubt, in all meetings of the committee the vote of the chairman who presides at a meeting of the committee shall be counted as one.

(6) Decisions of the committee shall be made by a majority of votes of members present and entitled to vote at the relevant meeting. In the event there is an equality of votes, the chairman who presides at a meeting shall have a casting vote.

Committee may invite others to meetings

3. The committee may invite any other person to attend any meeting or discussion of the committee for the purpose of advising the committee on any matter under discussion, but any person so attending shall have no right to vote at the meeting or discussion.

Disclosure of interest

4. (1) Any member of a committee who has or acquires a direct or indirect interest by himself, through a member of his family or his associates in relation to any matter under discussion or deliberation by the committee shall disclose to the chairman who presides at the meeting of the committee the fact of his interest and the nature of that interest.

(2) A disclosure under subparagraph (1) shall be recorded in the minutes of the meeting of the committee in which the matter is discussed or deliberated and, after the disclosure, the member -

(a) shall not be present in any discussion or deliberation, or decision of the committee, when the matter is discussed or deliberated or decided upon; and

(b) shall be disregarded for the purpose of constituting a quorum of the committee when the matter is discussed or deliberated or decided upon.

(3) For the purpose of this paragraph –

(a) "a member of his family" in relation to a member of a committee includes –

(i) his spouse;

(ii) his parent including a parent of his spouse;

(iii) his child including an adopted child or stepchild;

(iv) his brother, or sister including a brother or sister of his spouse; and

(v) a spouse of his child, brother or sister.

(b) "associate", in relation to a member of a committee means -

(i) a person who is a nominee or an employee of the member;

(ii) a firm of which the member or any nominee of his is a partner;

(iii) a partner of the member;

(iv) a trustee of a trust under which the member or a member of his family is a beneficiary; or

(v) any corporation within the meaning of the Companies Act 1965 [*Act 125*], of which the member or any nominee of his or a member of the

member's family is a director or has a substantial shareholding in the corporation.

Live participation by video links, *etc.*

5. The chairman may authorize a meeting by, or a member or person to participate in any meeting of a committee by, live video, television, internet or other appropriate communication or multimedia links.

Minutes

6. (1) A committee shall cause minutes of all its meetings to be maintained and kept in proper form.

(2) Any minutes made of a meeting of a committee shall, if duly signed by the chairman who presided at such meeting, be admissible in evidence in all legal proceedings without further proof.

(3) Every meeting of a Committee in respect of the proceedings of which minutes have been made in accordance with subparagraphs (1) and (2) shall be deemed to have been duly convened and held and all members thereat to have been duly qualified to act.

(4) A committee shall cause copies of the minutes of all its meetings to be submitted to the State Council as soon as may be practicable.

Procedure

7. Subject to this Act and any directions of the State Council a committee may regulate its own procedure.

Committee subject to directions of the State Council

8. A committee shall be subject to and act in accordance with any direction given to the committee by the State Council.

Validity of acts and proceedings

9. No act or omission done or proceedings taken by the State Council under this Act shall be questioned or invalidated on the ground of -

(a) any vacancy in the membership of, or any defect in the constitution of, the State Council;

(b) a contravention by any member of the State Council of the provisions of paragraph 4;

(c) the presence or participation of a member or person not entitled to be present or participate; and

(d) any omission, defect or an irregularity not affecting the merit of the case.

Allowances

10. There shall be paid to the members of the committee and any person invited to attend a meeting such expenses and other allowances as the State Council may determine.

EXPLANATORY STATEMENT

The National Water Resources Act 20... ("the proposed Act") seeks to provide, through the adoption of the principles of integrated water resources management, for the implementation of a national policy for a more uniform and consistent approach to the sustainable development, use and conservation of water resources in Malaysia.

The Waters Act 1920 [*Act 418*] is the current law which provides for the adoption of a more uniform and consistent approach to the control and regulation of water resources in the country. After more than 90 years, the Waters Act is out dated and no longer appropriate for current requirements. It also does not provide an appropriate role for the Federal Government in the sustainable development, use and conservation of water resources

The proposed Act will enable national and state authorities to manage all water resources including rivers, water bodies, ground water and stormwater in accordance with globally accepted principles of integrated water resources management.

PART I

2. Part I contains preliminary matters.

Clause 1 contains the short title of the proposed Act and its application within Peninsular Malaysia and the Federal Territory of Labuan. The Act comes into force on a date to be appointed by the Minister in the Gazette. The Act shall not, with the exception of the Federal Territories, come into force in any State until it is first adopted by the State Legislature. The Act shall come into operation in a Federal Territory on such date as the Minister shall by notification in the Gazette appoint.

Clause 2 contains the definitions of relevant words and phrases used in the Act.

Clause 3 provides a general assurance that this Act shall not in any way reduce or take away the existing powers, functions, rights, jurisdiction, duties and responsibilities of the State Governments or any other Government entity.

PART II

3. Part II provides for the establishment of the National Administration.

Clause 4 provides for the establishment of the National Water Resources Council, its members and functions.

Clause 5 provides for the appointment of a Director General of Water Resources and his functions and powers. Deputy Director Generals and such other officers as may be necessary may also be appointed to administer this Act.

PART III

4. Part III provides for the establishment of the State Administration.

Clause 6 provides for the setting up of the State Water Resources Council by the State Authority.

Clause 7 lists down the functions and powers of the State Council.

Clause 8 stipulates the membership of the State Council.

Clause 9 enables the State Council to establish committees to assist it in the performance of its functions and powers.

Clause 10 allows the State Council to delegate its powers and functions, other than its power to make regulations, borrow money or raise loans, to any Government entity.

Clause 11 enables the State Council to appoint, with the approval of the State Authority, a State Water Resources Director on such terms as the State Council may determine.

Clause 12 empowers the State Council, with the approval of the State Authority, to approve a scheme of service for the employment of officers.

PART IV

5. Part IV provides for the financial aspects of the operations of the State Council.

Clause 13 provides for the establishment of a Fund, which shall be under the administration and control of the State Council, the sources of the Fund and the purposes for which the Fund shall be expended.

Clause 14 provides for the State Council to sanction expenditure from the Fund.

Clause 15 allows the State Council, with the permission of the State Authority, to borrow sums required by the State Council to carry out its functions and powers.

Clause 16 requires the State Council to submit to the State Authority an estimate of expenses for the following year.

Clause 17 provides for the power to invest the Fund.

Clause 18 provides that the financial year of the Council begins on 1 January and ends on 31 December each year.

Clause 19 requires the Council to keep proper accounts and audit them.

Clause 20 allows the State Authority to investigate the accounts.

Clause 21 requires the annual report to be laid before the State Legislative Assembly.

PART V

6. Part V provides for the regulation and control of the use of water resources within the State.

Clause 22 vests responsibility for all water resources in the State with the State Council. Any other Government entity having similar functions or performing a similar task shall cooperate, coordinate and assist the State Council in the performance of its duties and responsibilities. The State Council may, in order to effectively carry out its functions, request the Government entity to provide such assistance and take such action as deemed necessary so as to be consistent with the proposed Act.

Clause 23 prohibits any person or Government entity from taking or using any resource or returning any resource to any water resource unless licensed by the State Council. The State Council may take such measures as it deems fit to ensure that the taking, use and return of any resource is sustainable, does not cause pollution or interferes with the flow or availability of water and mitigates floods.

Clause 24 prohibits any interference, diversion or disruption of the natural flow of water unless licensed by the State Council.

Clause 25 empowers the State Water Resources Director to regulate any works or activity carried out in a water resource or its catchment which is causing a reduction in the volume or flow of water or degradation of the quality of water or has an adverse impact on the use and conservation of water resources.

Clause 26 enables the State Council, with the State Authority's approval, to impose charges on the use of including any abstraction, extraction, discharge, return or impoundment of water or any other resources. The charge shall, where possible, take into account the economic cost of the resources.

Clause 27 allows the owner or occupier of any premises with frontage to any river or water body to abstract sufficient water for household and subsistence agricultural use without a licence or charge provided that it does not cause any adverse impact to the water resource or is not in excess of ten cubic metres per day.

Clause 28 enables the State Council to require any person or Government entity to take appropriate measures to prevent wastage or improper use of water.

Clause 29 prohibits the extraction of sand or other materials from any water resource or any activity or works which changes the nature of the bed, bank or shore of the water resource without a licence.

PART VI

7. Part VI contains provisions relating to the preparation and implementation of integrated management plans for water resources.

Clause 30 requires the State Water Resources Director, with the cooperation and participation of the Director General and other stakeholders, to prepare an integrated management plan for every river basin and any other water resource. The Clause stipulates what should be included in the Plan and that the Plan shall be valid for only five years after which a review shall be undertaken by the State Council.

Clause 31 requires the State Water Resources Director, prior to submission for approval of the State Council, to publish the draft plan and obtain feedback from the public.

Clause 32 provides for the State Water Resources Director, where any water resource is shared between States, to undertake the preparation of joint management plans in consultation with the relevant State.

Clause 33 requires that, once the management plan is confirmed by the State Authority, every Government entity within the State shall implement those measures in the plan that require its action.

Clause 34 provides for the State Council, in consultation with the Director General, to develop and implement efficient practices for the conservation and sustainable use of water resources.

PART VII

8. Part VII contains provisions for the declaration, management and regulation of protected water resource areas.

Clause 35 enables the State Council to declare and demarcate the limits of any area or part thereof to be a protected river reserve, resource conservation area, shore reserve, catchment area, flood zone, problem soil area or water intake area. The State Council may take appropriate measures within such areas to ensure that any activity or works carried out within such areas do not cause any adverse impact to the water resources within this area. No person may engage in any activity or works within the area unless permitted by a licence issued by the State Council.

Clause 36 defines the area to be considered as "river reserves" and enables the State Council to control and regulate any activity or works undertaken by any person or Government entity within such reserves.

PART VIII

9. Part VIII contains provisions for the management of water hazards including stormwater, floods, droughts and water pollution.

Clause 37 provides that any activity or works on land shall only be carried out if appropriate measures to minimise or avoid erosion, sedimentation or pollution of water resources. Any person seeking approval from the relevant authorities for development or construction on land, shall also submit a report and plan, to the State Council, for the mitigation of pollution, erosion and sedimentation of water resources. The plans and reports shall comply with the manuals, procedures and guidelines issued by the Director General.

Clause 38 and 39 prescribes measures that may be taken by the State Council, with the advice and assistance of the Director General, to adopt measures for flood defence and mitigation of flood disasters.

Clause 40 empowers the State Council, with the approval of the State Authority, to take appropriate measures to mitigate the impact of drought.

Clause 41 enables the State Water Resources Director, in the event of an accident resulting in significant contamination of a water resource, to take appropriate measures to minimise the impact or risk to the water resource.

Clause 42 prohibits any person from discharging any pollutant into a water resource or on land that may result in the pollutant entering a water resource except with a licence issued by the State Council. The licence may only be issued, subject to standards and guidelines issued by the Director General, and only if the discharge does not pose any threat to the quality, quantity or flow of the water in the water resource.

PART IX

10. Part IX contains provisions related to the control of activities on any river or water body.

Clause 43 requires any person, navigating a vessel on any river or water body, to be licenced. The State Council shall, to ensure the safety of the public and protection of the environment, cause all vessels to be registered.

Clause 44 enables the State Council, in order to ensure safety of the public and protection of the environment, to control and regulate any recreational or leisure activity on or in any river or water body.

PART X

11. Part X of the proposed Act contains provisions related to licencing.

Clauses 45 to 47 prescribe the procedure for application of a licence, its form and content, public comments on significant activities and approval.

Clauses 48 and 49 enable the State Council to issue the licence subject to appropriate terms and conditions, determine its maximum period of validity and extensions thereof and impose a security deposit.

Clause 50 requires the State Water Resources Director to maintain a register of all licences issued and this Register shall be accessible to the public.

Clause 51 requires every licensee to comply with the terms and conditions of the licence issued. If required by the State Director, the licensee shall certify in its annual report to the State Council that it has complied with all terms and conditions of the licence.

Clause 52 authorises the State Water Resources Director, in the event there is a change of circumstances as specified in this Clause, to vary any condition to a licence.

Clause 53 enables the State Council to revoke the licences in the event of misleading statement in the application, non compliance with the terms and conditions imposed or any other wrongful act by the licensee.

Clause 54 provides for the instances when a licence is deemed terminated.

Clause 55 provides for the establishment of the Appeal Tribunal.

Clause 56 provides for the membership of the Appeal Tribunal.

Clause 57 allows the Appeal Tribunal to determine its own procedure.

Clause 58 provides for the establishment of a Secretariat to assist the Appeal Tribunal.

Clause 59 determines the proceedings of the Appeal Tribunal.

Clause 60 provides for persons who may appeal to the Appeal Tribunal.

Clause 61 provides that an appeal shall not be a stay of action.

Clause 62 provides that the Appeal Tribunal shall have the powers of a subordinate court.

Clause 63 provides that the decision of the Appeal Tribunal shall be final and binding on the parties.

PART XI

12. Part XI contains provisions related to enforcement.

Clause 64 provides for enforcement by authorised officers.

Clause 65 empowers authorised officers to enter any premise to monitor any activity, carry out any survey or data collection and to take meter readings, samples or measurements.

Clause 66 provides for the power of an authorised officer to enter any premise, vessel or vehicle to conduct a search, investigate or seize any items necessary for the conduct of an investigation into any offence.

Clause 67 requires the authorised officer, on demand, to produce evidence of his authority to be on a premise, vessel or vehicle.

Clause 68 provides for the State Water Resources Director, where there is a significant threat to any water resource, to issue any directive to any person to cease any activity or works and take such measures and actions as are necessary to protect the water resources.,

Clause 69 provides for the State Water Resources Director, where any resource is removed from or material deposited in any water resource in contravention of the proposed Act, to impound such resources or material including its possible forfeiture and disposal.

Clause 70 specifies that in the event of a breach of any order or directive, the State Water Resource Director may enter the site of activity or works and carry out the measures and actions necessary to give effect to the order or directive.

Clause 71 allows for the disconnection of untreated water supply by the State Water Resources Director where an offence is committed under the proposed Act

Clauses 72 and 73 provides powers to an investigating officer to require attendance before him of any person acquainted with an offence under the proposed Act and the admissibility of statements made in evidence.

Clause 74 provides that any owner or occupier of any premise or who uses any water resource may be required to install and operate any equipment and submit data and information pertaining to the activity or works carried out.

Clause 75 provides for the State Water Resources Director to require any person to submit any information to him.

Clauses 76 and 77 provides for the powers of arrest and prosecution.

PART XII

13. Part XII of the proposed Act contains provisions relating to offences and penalties.

Clauses 78 and 79 provide for matters related to offences and penalties for licenses, directives or orders where no offence and penalty is expressly provided for in the proposed Act.

Clause 80 empowers the Court to order a person convicted of an offence to pay, in addition to the fine, an amount equivalent to any monetary benefit that may have accrued to him as a result of the commission of the offence.

Clause 81 specifies the penalty for obstructing or impeding an authorised officer lawfully carrying out his powers under this Act.

Clause 82 imposes a penalty on any person who breaks or removes any seal placed by an authorised officer.

Clauses 83 and 84 provides for offences committed by a body corporate or act or omission of an agent or employee and the person who may be charged in such instances.

Clause 85 provide for matters related to offences and penalties in general, where no offence and penalty is expressly provided for in the proposed Act or subsidiary legislation made under the proposed Act.

Clause 86 provides for the penalty for a continuing offence.

Clause 87 empowers the State Council to prescribe any offence under the proposed Act or subsidiary legislation made thereunder as an offence which may be compounded under the proposed Act.

PART XIII

14. Part XIII of the proposed Act deals with miscellaneous issues.

Clause 88 provides that all officers of the State Council shall have right of free access to any land for the purpose of implementing the provisions of this Act.

Clause 89 sets out the manner of service of documents on any person.

Clause 90 provides protection to the State Water Resources Director, State Council and its members and officers from legal suit or prosecution for any act done in good faith and necessary to implement the Act.

Clause 91 empowers the State Water Resources Director to prescribe forms for any book, instrument or notice under this Act.

Clause 92 empowers the State Council, with the approval of the State Authority, to make such regulations as deemed necessary to carry out the provisions of this Act.

Clause 93 enables the Minister to also, in consultation with the National Council, make regulations for the better carrying out of the provisions of this Act.

PART XIV

15. Part XIV provides for any transitional provisions to ease implementation of the proposed Act.

Clause 94 enables the State Authority, upon the coming into force of the proposed Act, to amend or repeal existing State Enactments.

Clause 95 empowers the State Authority, by way of regulation, to make any transitional provisions deemed necessary to remove any difficulty that may arise due to the implementation of the proposed Act.

FIRST SCHEDULE

The First Schedule sets out the procedure for the meetings of the National Council.

SECOND SCHEDULE

The Second Schedule deals with the appointment of members and meetings of the State Council and matters related thereto.

THIRD SCHEDULE

The Third Schedule provides for the appointment of members of any committee established by the State Council, its meetings and other matters pertaining thereto.

SECTION 4

INSTITUTIONAL ARRANGEMENTS

Section 4

INSTITUTIONAL ARRANGEMENTS

4.0 INSTITUTIONAL ARRANGEMENTS

4.1 INTRODUCTION

The draft National Water Resources Policy (NWR Policy) and the draft National Water Resources Law (NWR Law) will require an institutional arrangement (organisation, function and responsibility) to address the implementation of the core thrust areas on sustainability, security, partnership, with uniformity in planning and management of water resources in the country. The existing institutional arrangements pertaining to the administration of water and water resources are reviewed in this Section followed by a proposal for an institutional arrangement to ensure adequate, secure and safe water for all, including the environment. The proposed institutional arrangements have been appropriately designed to support the aspirations of the stakeholders captured within the draft NWR Policy and legislation.

4.1.1 Section Structure

Sections 4.1 through 4.6 provide a review of the current water resources management and institutional arrangements based on a situational analysis approach. It outlines the objectives and directions, and subsequently provides the guiding principles for an institutional structure (after a review of the current institutional arrangement) for water resources management before progressing towards Sections 4.7 and 4.8, which are on the separation of responsibilities in the water sector. Finally, the Study will recommend various models for institutional arrangements at the national and State levels for water resources management.

A series of Annexes, (from **Annex 4.1 to 4.8)** is enclosed, which should be referred to for details. The Annexes include write-ups of a Water Resources Functional Model (WRF Model) with a set of standard functions that a water resources agency should and must have to function effectively. This is to respond to the recommendations made by the stakeholders in the Second Consultative Workshop in May 2010, when a technical water resources agency was recommended by them, but the rationale for the choice had not, at that time, been clearly articulated by the stakeholders. Therefore, this recommendation is examined in detail in this Study with the aim of testing to what level the recommendation by stakeholders is valid.

The Study proposes options at the national level for an institutional arrangement that when fully mandated, will pave the way for integrated water resources management (IWRM) in the country as stated in Section 1 of this Volume. The choice of institutional structures will be a decision that the Federal and State Governments will have to make at a later date after detailed consultations between them, especially when it relates to the roles and functions of the National Water Resources Council (NWRC) *vis-à-vis* that of the State Water Resources Council (SWRC) or its equivalent. In this regard, there is also a need for clear collaboration and support between the Federal and State Governments and vice-versa on water resources policy matters, water integrity and best management practices in water resources planning, development and management, that will benefit the States and the country as a whole as stated in the proposed draft NWR Policy and Law, where water is a national asset that has to

be conserved and sustained for all, including the environment. Inherent in the institutional arrangements mentioned above, there will be a need for a National Technical Water Resources Agency/Department to take on the technical functions of implementing the national water resources policies at the national level, and an equivalent State technical water resources agency/department at the State level.

Section 4.2 introduces the salient issues and challenges related to the current institutional approaches in Malaysia; essentially outlining the issues and problems that the Government wishes to address to achieve long-term sustainable management of water resources that underpin the objectives for the development of recommendations for an institutional framework provided in Section 4.3, and with recommendations made in the subsequent sections.

Section 4.4 provides an overview of some international and all ASEAN institutional approaches in water resources management, highlighting the progress, status and positive lessons that can be brought into the Malaysian context for the benefit of the nation towards achieving the Water Vision, whilst Section 4.5 describes the current Malaysian institutional approaches examining how the country came to be in this present position with regards to water resources management. Some of these have already been stated in the introductory Section 1 on Water Resources Governance of this Volume 2.

Section 4.6 provides a review of the previous NWRS (2000) period of 10 years, looking at the achievements in the water sector to the present.

Section 4.7 then provides an overview of the institutional arrangements at the Federal and State levels and the separation of functions and responsibilities that follow the water sector reforms, into the *Water Services* and *Water Resources* sectors.

Section 4.8 provides the options for future institutional arrangements. It also provides the parameters in the selection of an agency to be the National Water Resource Department (NWRD) through a comparative analysis of the functions of the Department of Irrigation and Drainage (JPS/DID) and other water-related agencies in the country against the functional requirements contained in the WRF Model, and re-alignment requirements of the functions of DID against the functions and requirements in the WRF Model. This latter part is detailed in the **Annex 4.8.**

4.2 CHALLENGES IN INSTITUTIONAL ARRANGEMENTS

4.2.1 Coordination and Integration

(i) The Federal Government has recognised that water is a national asset and is also a part of the nation's heritage. At the same time the Federal Government also recognised water as an economic and social good when it subscribed to Chapter 18 of Agenda 21 after the Earth Summit in Rio de Janeiro in 1992. Thus, from an institutional perspective, it means that all institutional arrangements in managing water resources should be aligned and strengthened consequent to the Government's aspirations. Presently, the most salient issue of all, although not often

highlighted enough or recognised sufficiently as a key concern, is the recurrent shortfall in coordination and integration in the management of water resources among water-related institutions. Too often Malaysia's natural waters (our national asset) are subjected to multiple developmental pressures and inadequate sustainable management, particularly in the area of institutional integration and coordination. This often results eventually in conflicts and adverse impacts between and among water resource users, resulting in the paradox of water scarcity in areas of plentiful water, and the inevitable degradation of the water resource itself.

(ii) The above issue is an institutional management issue in that multiple agencies operate for various purposes guided by individually yet legislatively-backed agendas, in the absence of aiming to achieve sustainable and integrated water resources (and by extension, biodiversity and natural resources) management. This issue is partly a result of Malaysia's administrative history in that the management of water has always been primarily sectorally-focused. Other complications such as constitutional matters between the Federal and State further challenge the integration of water resources management in the country. However, Malaysia is not alone in facing and addressing these issues, as integrated water resources management challenges are a symptom in many other countries requiring both short and long-term integrative solutions.

(iii) The institutional landscape for water resources management in Malaysia went through a considerable re-organisation after the March 2004 Cabinet reshuffle that has created some form of integration in the water sector, but not all. Because of the Government's commitment towards IWRM, former water-related agencies and ministries were re-organised, with the water functions being separated into four new Ministries; the Ministry of Natural Resources and Environment (MoNRE); the Ministry of Energy, Water and Communication (MEWC), which has since been changed to the Ministry of Energy, Green Technology and Water (KeTTHA)[1] in 2009; the Ministry of Agriculture and Agro-based Industry (MOA) originally the Ministry of Agriculture; and the Ministry of Housing and Local Government (KPKT). With this new set-up, there is:

(a) A separation of utility services and/or combination with regulatory roles (KeTTHA and MOA), and regulatory (MoNRE and KPKT) roles in the water sector;

(b) Facilitation in allowing greater private sector involvement in the water utility and water-related (i.e. sewerage) services; and

(c) Bringing together of all the major natural resource-based agencies (land, water, mineral, forest and the environment) under one Ministry to facilitate and ensure that all natural resources are planned and managed holistically (i.e. MoNRE).

1 In Malay - Kementerian Tenaga, Teknologi Hijau dan Air, Malaysia.

(iv) While KeTTHA is entrusted with looking after water services, MoNRE looks after water as a natural resource. This is an essential distinction that paves the way for the MoNRE to play a fundamental role in national water resources planning and management in the country for security reasons. It fosters an integrated approach within the framework of IWRM at the broadest scale (that includes all natural resources departments within the Ministry, and other related institutions such as civil society organisations and non-governmental organisations).

(v) The main draw-back since the formation of the MoNRE in 2004, when compared to the water services sector development in KeTTHA, is that it does not have a water resource legislation and a policy to provide the mandate for an institutional arrangement with a dedicated national technical water resources agency, to carry out the work of water resources management and development in the country. Granted that water is a State matter that must be respected and upheld, water is still a national asset, and water security is a national priority. This means that water has to be planned and developed in an integrated manner at the national level to obtain the maximum benefits from the resource for all sectors in the country.

(vi) MoNRE, being the custodian of Integrated Natural Resources Management (INRM), which includes land, water, forests, minerals and the environment, has to safeguard the security of water resources in the country for various beneficial water uses and for consumers. This can be carried out through water conservation and sustainability approaches, with one such approach being IWRM, a sub-set of Integrated National Resources Management (INRM). In the absence of a dedicated water resource agency in MoNRE, IWRM which is the core water resource functions to ensure adequate and safe water for all water users, many issues and problems remain unresolved that could have easily been avoided if there is a dedicated technical agency to provide technical solutions on such matters.

(vii) Currently, the MoNRE has entrusted most of the technical functions on water resources matters including international water resources obligations and commitments to the DID. The DID therefore has to carry out not only its existing functions of looking after drainage, rivers and coastal areas, but also all other works as required by the MoNRE. However, as the name suggests, the name does not reflect the water resources functions and responsibilities that the DID undertakes in MoNRE. Until there is a name change, the recognition that it is carrying out water resource management functions, is still tenuous. It is thus important that DID change its name as recommended by the stakeholders, when they recommended the DID as the most appropriate agency to carry out the functions and responsibilities of IWRM for the country, having had the experience for more than two decades since the Earth Summit in Rio de Janeiro in 1992 where it was the leading agency that put Malaysia on the international water resources map through its membership in the Global Water Partnership Network. The DID is also the agency that assists in implementing all the international and regional obligations at the national level pertaining to water resources such as: the Dublin Principles (1992); the Millennium Development Goals (2000); the World Water Forums established under the auspices of the World Water Council, first held at Marrakech, Morocco, which produced the Marrakech

Declaration; the World Water Vision for Life and Environment for the 21st Century, with the Second World Water Forum held in the Netherlands leading to the Declaration of the Hague on Water Security in the 21st Century; the Third Water Forum in Kyoto, Shiga and Osaka, Japan; and finally the Fourth World Water Forum in Mexico City. The DID also carries out for MoNRE the actions needed to achieve the objectives of the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, where world leaders re-committed themselves to the Millennium Development Goals and pledged to develop IWRM and water efficiency plans by 2005. All the above shows that there is a critical need for a dedicated national water resources agency in MoNRE, which the DID can easily fit into without major problems of re-alignment of the existing functions that it undertakes presently.

(viii) The biggest challenge in the water resources sector is in the abstraction and use of water from rivers, where coordination and integration are most needed. The largest user of raw water is the agricultural sector (mainly for irrigation of wet paddy in the Integrated Agricultural Development Area schemes (IADA)), amounting to about 63% of the total water demand in the country. Agriculture is not only the single largest water user but also a major non-point source polluter of surface and groundwater. Yet any reduction in water allocation for agriculture will pose severe socio-economic consequences. Therefore, water for agriculture has always taken precedence over other lesser uses of water except for potable water supply. In terms of IWRM, this aspect has to be given priority as in the case of water for domestic and industrial purposes.

(ix) The responsibility of looking after a large volume of water in the river system for agriculture however creates yet another set of challenges and issues in terms of coordination, and more so after the 2004 Cabinet reshuffle, where irrigation remains in the Department of Agriculture (DOA) and the Irrigation and Agricultural Drainage Division (BPSP) under the MOA; while the DID, which looked after irrigation and drainage in the past, is now placed under MoNRE looking after drainage in the agricultural sector. Thus, currently, the institutional arrangement of water resources management in these large agricultural areas has become very complex, but paradoxically, it has become a demonstration of good coordination between the DID and the MOA. The DID is now looking after irrigation for MOA through a special arrangement, while drainage remains as its core portfolio in the agricultural sector. This arrangement seems to work well so far. However, in the long-term, the separation of irrigation and drainage functions in the large agricultural areas will become impracticable and could lead to unsynchronised management and wastage of water resources in these areas, if it is not well coordinated. These areas are therefore potential hotspots in water resources management, which can frustrate the current working arrangements between DOA/BPSP and DID.

(x) Another area of concern is the quality of the return flows from agricultural areas, and industrial effluent from industries. The return flow is often highly polluted, which can adversely affect many water-based industries and aquaculture farms located along river systems and coastal areas. So far, the DOE has no jurisdiction over non-point pollution sources nor effluent discharge of less than 60 m^3 per day from industries,

and the DID is not mandated by legislation to look after the ambient water quality in rivers. This particular aspect will urgently need to be addressed through the proposed legislation and policy.

(xi) There is a possibility that eventually, disparate and uncoordinated approaches in the management of water resources may lead to unsustainable development especially at State level. While water is used by many users, the current system of water resources management lacks a comprehensive Federal-State mechanism to set broad guidelines on where to abstract the water, and the maximum amount that can be allocated from a particular location based on the carrying capacity of the rivers in river basins. Such guidelines will be necessary to assist in the administration of water resources at the river basin and State levels especially when they set their own priorities for various legitimate water uses. Increased adoption of technology at State level will increase water productivity (example, more crops per drop) within the constraints imposed by pollution from socio-economic and industrial activities.

(xii) Besides the four main Ministries that have direct interests in water resources (MoNRE, KeTTHA, MOA and KPKT), four other Ministries also have interests in water resources, mainly from the users point of view and/or are polluters of the water. These include the Ministry of Rural and Regional Development (from activities on the carried out by the development authorities); Ministry of Tourism (from water-based recreation, sports and tourism); Ministry of Works (through infrastructure works etc) and Ministry of Transport (through navigation of inland and coastal waters). All these Ministries with their respective departments have directly and indirectly imposed impacts on water or a need for water. The return flows also cause river water pollution and thus obviously there is a need for a Federal-State mechanism to control all forms of pollution in all river systems.

(xiii) The current water resources management systems remain a concern because of Malaysia's administrative history, where the roles and responsibilities are sectorally-based. Water-related agencies have a set of functions that they will have to fulfil that could have repercussions on other agencies. Coordination among agencies is thus important. Presently, this remains vague and grey to the point that even water statistics and information are seldom shared among Government institutions. This sectorally-focused approach will remain as long as there is no dedicated agency to centralise the collection, collation and dissemination of water resources statistics, which is becoming a problem especially when such information are most needed in planning for water resources development in the country.

(xiv) For a comprehensive overview of all Ministry and Department current functions in water resources management please refer to **Annex 4.5** of this Volume.

4.2.2 Implementation Follow-up and Follow Through

(i) The second primary institutionally-related issue in natural water resources management, is a lack of 'follow-up and follow through with implementation' on the many initiatives, plans, meetings, workshops, capacity building and policy initiatives

that have taken place for sustainable management of water resources. This issue is embedded in the first main issue, that of a lack in integration and coordination of functions. In the 2005 IWRM Strategic Planning Workshop for Malaysia for example, where these two salient institutionally-related issues were identified, it was noted that to achieve integration of the various water sectors, there was a dire need to create the necessary institutional, legal, social and economic environment and systems of incentives for the stakeholders associated with each water sector, to support 'integration' rather than take the 'tidak apa' attitude to look after their own sectoral interest (MoNRE, 2007).

(ii) The above clearly sums up the current situation on the need for a paradigm shift regarding the management of water resources in the country, of which the water resources policy and legislation aspire to put in place. What is more important is that these initiatives are followed by implementation, which is often a challenge.

4.2.3 Limited Performance of IWRM and Other Institutional Issues

(i) Other challenges pertinent to the institutional aspects, relate more to 'effective performance' of sustainable integrated water resources management, i.e. there is a lack of awareness on the need for water conservation and sustainable management; a lack of knowledge both in the public realm and within the institutional framework of core components and the purpose of IWRM; a need to enhance the capacity of the public service and related institutions relevant to water resources management; and the need to develop comprehensive best water management practices appropriate to the Malaysian context.

(ii) The issues that are couched within the existing institutional framework include:

(a) Continued deterioration of water quality and the need for enhanced enforcement;

(b) The current rapid rate of landuse change and the resultant environmental deterioration often associated with this change that has to be taken into consideration in water resources planning and management;

(c) Effective flood management through careful and prudent planning (e.g. disallow the construction of new buildings within the path of known serious flood flows, or the path of hydroelectric dams etc);

(d) The need to implement effective and equitable water demand management regimes;

(e) The need for counter-measures planning to avert deterioration of the water environment so that the aquatic ecosystems can survive, and where the river basins are used as units for water resources planning;

(f) A need to enhance water knowledge and expertise within the public service;

(g) The need to increase financial allocations for water resources planning, research and information collection;

(h) A need to increase political will and commitment towards water resources management;

(i) The need to enhance the promotion and understanding of IWRM;

(j) The need to strengthen the capacity of Government and as equally important, the non-government agencies or entities involved in (directly or indirectly) water resource management, especially regarding water demand management;

(k) Management of international issues and implementation of international commitments and agreements that could pose a challenge to the Federal Government when States adopt different approaches to manage these resources within their respective jurisdictions; and

(l) Inter-state and trans-boundary rivers that could also pose challenges when two or more States adopt different and perhaps conflicting approaches in managing a shared river.

(m) All of the above issues need to be resolved.

4.3 OBJECTIVES

The above discussion on the institutional water resources management challenges underpins the objectives of the Study, which are:

(i) The provision of recommendations for an institutional arrangement that when implemented, will support the sustainable use and conservation of water resources in the country (based on the draft NWR Policy);

(ii) That the institutional arrangement will support uniformity of law and policy to promote enhanced security of water resources throughout the country in accordance with the Constitution (based on draft NWR Policy and draft NWR Law);

(iii) The provisions of an operational institutional organisation model that will function efficiently and effectively to implement the policy and legislation (based on TOR and the aspirations and outcomes of the three Stakeholder Workshops); and

(iv) The functions and responsibilities of the water resources agency or agencies so formed that the aligned institutional arrangement will conform to Articles 92, 93, 94 and 95 of the Constitution (based on the Federal Constitution and draft NWR Law).

4.3.1 Guiding Principles and Obligations

(i) As the demand for water resources continues to increase, Malaysia will likely experience further water shortages due to a combination of actual water scarcity and water pollution caused by the growing population, increasing urbanisation, changing industrial processes and agricultural practices, and climate change. Based on a review of the functions of eight key Ministries with their corresponding departments, any preferred course of action for change within the current institutional arrangement for water resources governance will be difficult and complex. Because of this, one of the basic principles followed in this Study is that, any proposed institutional arrangements shall not have any major devolution of the current functions of any existing agencies, but rather to strengthen their water resources functions through collaboration to manage water resources effectively in the country.

(ii) Currently, different States are at different stages and using different approaches towards water resources management. Most States already have some form of institutional structure empowered by State water enactments for the management of water. These States shall for all intent and purposes be left to continue to operate within their existing organisational structure until such time they may want to undertake a re-organisation of their institutional structure to take on the true functions of water resources management (as opposed to strictly water services functions), if they so decide to adopt, and to be consistent with the new Federal legislation and the national policy for water resources management.

(iii) The eventual success in the implementation of IWRM by all the States depends to a very large extent on the availability of sufficient expertise, manpower and funding. The State authorities may require Federal support to implement water resources projects as they generally often have limited financing for development and management of such resources. A Federal-State mechanism is therefore required to oversee to Federal financing to the States to support amongst others, capacity building to ensure that their water resources are effectively managed. In order for the Federal Government to provide such support to the State Governments, it will be necessary for each State to first formulate and adopt a State enactment, which is consistent with the NWR Law and policy to promote uniform practices in IWRM among all States in the country.

4.4 INTERNATIONAL INSTITUTIONAL ARRANGEMENTS IN WATER MANAGEMENT

One of the main thrusts in water resources governance is moving towards building an integrated organisational structure that is mandated by legislation and consistent with the policy to carry out its functions and responsibilities effectively and efficiently. Although an integrated approach is recognised and often heralded as the best option in many countries (including in the Organisation for Economic Co-operation and Development, OECD), most of these countries still have yet to achieve such an integrated organisational structure.

This section will present a review of the water resources and water-related agencies/institutions in the Association of South East Asian Nations (ASEAN) countries and

in selected non-ASEAN countries to provide an insight into their administrative arrangements for water resources management as reflected in their institutional structures. The specific focus of the review is on the names and structures of their water institutions, which are reflections of the emphasis given by them regarding integration towards IWRM, and which could be used as a point of discussion in our IWRM approaches in the country.

4.4.1 Water Management Institutions in ASEAN Countries

(i) All ASEAN countries, without exception, have agencies that deal with water services, reflecting the importance of water for consumptive use. However, the responsibility for development and management of water for various consumptive uses is split into many departments as is the case in Malaysia. Non-consumptive use such as water for nature and the environment is gaining in importance and therefore there are specific agencies set up in some of these ASEAN countries to deal with this aspect of water use, similar to Malaysia.

(ii) In Brunei Darussalam, provisions for water services, mainly for potable water is a function of the Department of Water Services in the Ministry of Development, whilst infrastructure development is carried out by the Public Works Department in the same Ministry. There is some similarity with Malaysia before the MoNRE and KeTTHA were formed in 2004 that separated the functions of water into water resources and water services. The water services projects and infrastructure development in Malaysia are mainly taken over by privatised corporations, KeTTHA, Tenaga Nasional Berhad (TNB), and the Ministry of Agriculture, while this is not so in the case of Brunei Darussalam.

(iii) Not many countries in ASEAN have agencies that are responsible for water resources *per se*. As shown in **Annex 4.1**, five countries (Cambodia, Malaysia, Singapore, Thailand and Vietnam), have Ministries that deal with water resources. None of the ASEAN countries, except Malaysia, has a federated constitutional structure, but their institutional arrangements for the water sector at the national level, have many similarities. This is reflected in the names of their Ministries that deal with water and water resources, which are quite similar. In Cambodia for an example, it is called the Ministry of Water Resources and Meteorology and in Singapore, it is called the Ministry of Environment and Water Resources. In Malaysia, Thailand and Vietnam, the Ministry bears the same name – the Ministry of Natural Resources and Environment.

(iv) To reflect the importance of the water services sector, many agencies in the Ministries have names to reflect their specific functions. For example, in Singapore, water services and water resources are portfolios of the Public Utilities Board while their National Environment Agency takes care of water pollution and the environment. In Cambodia, the water service sector is under the Department of Water Supply, while water resources are the responsibility of the Department of Engineering under the Ministry of Water Resources and Meteorology.

(v) Thailand has a specific Department of Water Resources in their Ministry of Natural Resources and Environment (called MoNRE), whereas there is none in Malaysia, although the ministerial functions of looking after water resources in both countries are nearly similar, with similar names. Some aspects of water resources development and management (such as urban drainage, flooding and rivers) are under the portfolios of the DID in Malaysia. Thailand has a similar DID set-up and is called the Royal Irrigation Department under the Ministry of Agriculture and Cooperatives, but water resources development and implementation are wholly under the Department of Water Resources in MoNRE Thailand. In addition, Thailand has an Office of Natural Resources and Environmental Policy and Planning that deals with nationwide policy and planning matters that include water resources planning. There is no equivalent of such an office in the MoNRE in Malaysia, although there are units for water resource planning at the Economic Planning Unit under the Prime Minister's Department at the Federal level, while the States have their own State water planning units, mainly under the State Economic Planning Unit or at State DID.

(vi) Vietnam has a similar institutional arrangement as in Thailand (also a non-federated country). It has a Department of Water Resources Management under the Ministry of Natural Resources and Environment (MoNRE Vietnam) similar to Thailand. The functions of this Department encompass water allocations, flood and drought management, drainage, river health and water pollution. Irrigation service however is under the Water Resources Bureau in the Ministry of Agriculture and Rural Development. The only difference between this Department in Vietnam and that of the Department of Water Resources in Thailand, is the responsibility for prevention of water pollution. Thailand has a separate department for water pollution control called the Pollution Control Department. There is no equivalent in Vietnam and the Department of Water Resources Management in Vietnam has this additional responsibility.

(vii) Vietnam has a Water Law (1998) that is currently being revised to be completed by end of year 2010 to strengthen the focus on sustainability of water resources and environmental concerns. One of the main features of the revision is with regards to the functions of the Ministry (MoNRE Vietnam), to separate its role as regulator and services provision, and to strengthen the role of the National Water Resource Council (NWRC) as an independent body from the government. The NWRC in Vietnam is mandated by law and the functions are much wider than the NWRC in Malaysia, which has yet to be mandated by legislative provisions.

(viii) Six ASEAN countries have national water resources councils, which act mainly in an advisory capacity to the governments. These are Indonesia (National Water Resources Council), Laos PDR (Water Resources Coordination Committee in the Prime Minister's Office - WRCC), Malaysia (NWRC), Vietnam (NWRC), Philippines (National Water Resources Board) and Thailand (Office of Natural Resources and Environmental Policy and Planning). In the Philippines, the Water Resources Board is independent (under a charter and decree), and in Vietnam, the NWRC is under the MONRE, whereas in Indonesia it is also an independent body similar to the Philippines. The rest of the three countries have their councils under the Prime

Minister's Offices. It can be seen that the water resources councils in these six countries have very high ranking positions in terms of empowerment to act according to the policies or legislative provisions of the respective countries.

(ix) Brunei Darussalam, Cambodia, Myanmar and Singapore do not have an equivalent National Water Resources Council, but in the case of Singapore, central planning in the Prime Minister's Office provides the direction for water resources development in the country. This is also true in all the other countries, where various individual departments implement and co-ordinate the development and management of water, where the focus is on water services and water pollution prevention and control rather than on water resources management *per se*.

(x) Myanmar is in an anomalous situation in that it places a high emphasis on water resources but has no specific department that deals with water resources nor having a water resources council in the country. Its only equivalent based on water use, is the Directorate of Water Resources and Improvement of River System under the Ministry of Transport. The focus is to protect the river for river transport and, currently for generation of hydropower (under the Ministry of Electric Power). The emphasis on agriculture to the economy is shown in terms of having the Ministry of Agriculture and Irrigation, which separates the functions into the Irrigation Department and the Water Resources Utilization Department, slightly similar to Malaysia.

(xi) Philippines follows the American system of administration in having a Department of Environment and Natural Resources that deals mainly with the environment, and a Department of Agriculture that has a Bureau for Soil and Water Management, but none for water resources management, although it has a National Water Resources Board, which is an apex body with advisory functions.

(xii) The review results show that the water sector institutional arrangements in all the ASEAN countries are shaped by history and situational exigencies. All the countries have focused strongly on water service provisions and infrastructural development, and on water quality. The names and functions of their departments reflect this focus. However, because of changing concerns, international benchmarking and a strong move towards integrated water resources governance or IWRM, most of the countries are reviewing their regulatory, implementation and enforcement functions of their institutions to align with the new paradigm shift towards water efficiency planning and IWRM approaches.

(xiii) All the ASEAN countries are part of the Global Water Partnership (GWP) Network and the regional South East Asian Water Partnership (GWP-SEA) Network that advocate water reforms towards IWRM, integrated river basin management (IRBM), integrated flood management (IFM) and integrated lake management (ILM). At the World Summit on Sustainable Development in 2002 in Johannesburg, all the countries including the ASEAN countries have been urged to carry out water efficiency plans that will pave the way for the integration of water resources planning and management in the 21st century. Malaysia is a party to this approach and has

since been advocating this through policy statements in the 9th and 10th Malaysian Plans.

4.4.2 Water Management Institutions in Selected Non-ASEAN Countries

(i) A summary of the different approaches to water resources management in five non-ASEAN countries (Australia, Brazil, France, United Kingdom and Japan) to compare with the situation in Malaysia, is provided in **Annex 4.2.** Among the five countries, only Australia has a federated system of government similar to Malaysia and to a certain extent, the United Kingdom. Of the five countries, the water resource governance structure of Brazil is more akin to that of Malaysia, while Japan and France have very different structures altogether. All five countries have strong orientations towards water services, and a summary of the salient features in their institutional arrangements is provided in sub-sections (iii) to (vii) below.

(ii) The reviews of the ASEAN countries and the five non-ASEAN countries show that different countries have different forms and formats for institutional arrangements depending on their own requirements, and what they perceive as important in terms of benefits arising from the arrangements. There are no standard formats in terms of institutional arrangements although the objective is basically the same, and that is, to conserve and sustain water for all legitimate uses. This is also true in the case of Malaysia as will be seen in the Sections below.

(iii) Australia

(a) Water in Australia is governed through a complex system of shared Commonwealth and Territories arrangement. Much of the water governance is embedded within the responsibility of the National Water Commission (NWC), which is an independent statutory authority. In addition, there is the Council of Australian Governments (COAG) that spearheads reforms in the water services and water resources sectors. The areas of water governance include water pricing and economic regulation; rural and regional water planning and management; metropolitan water planning and management; water markets; water supply and services; drinking water management; recycled water management; and environmental health management.

(b) In 2004, COAG adopted the National Water Initiative (NWI), which is a blueprint for water reform, being a shared commitment by the Commonwealth and Territories governments to increase efficiency in water use. These commitments were predicated on six central aspects for water, these being: preparation of water plans with provisions for the environment; dealing with over-allocated or stressed water systems; introduction of registers of water rights and standards for water accounting; expansion of the trade in water; improvement in pricing for water storage and delivery; and meeting and managing urban water demands.

(c) To facilitate the implementation of the NWI, which is central in addressing water resources management issues, three Ministerial councils were formed. These are:

- The Murray-Darling Basin Ministerial Council (which has a policy, decision-making and advisory role in water resources management in the shared river basin);
- The Natural Resources Management Council (which serves as a forum for consultation, coordination and to an extent integration of actions by State governments on matters related to resources management issues, similar to NWRC in Malaysia); and
- The Environmental Protection and Heritage Council (this oversees to the broad national policy issues related to environmental protection pertaining to air, water and wastes).

(d) In perspective, Australia's policies and programs on water are geared more for a water-stressed country trying to resolve equitable distribution of water to maintain the productivity in the farming heartlands of the Murray-Darling Basin that is shared between four States. In the case of Malaysia, which is not a water-stressed country, the nearest equivalent is in the Integrated Agricultural Development Areas (IADA) where there is shared water within and between river basins such as in the Sg Kerian-Kurau basins between the States of Pulau Pinang, Kedah and Perak (with some similarities to the Murray-Darling Basin Ministerial Council).

(iv) Brazil

(a) The institutional structure in Brazil is more similar to that in Malaysia. The institutional structure is couched on the 1997 Brazil Water Policy Act (Federal Law No 9433/97) that approved the Brazilian National Water Resources Policy and created the National Council on Water Resources (NCWR) to promote the integration of water resources planning at national, regional, state as well as between user sectors.

(b) The NCWR is chaired by the Minister of the Environment (in Malaysia, the NWRC is chaired by the Prime Minister and lately by the Deputy Prime Minister), and its memberships consist of representatives from the Federal Government Ministries, representatives of the State Councils on Water Resources, water users and civil organisations. The membership in the NCWR has more representations than the NWRC in Malaysia, as it includes many water users and members from the civil society.

(c) In terms of implementation, the National Water Authority (NWA) is the authority entrusted with the implementation of the National Plan for Water Resources and sits within the Ministry of the Environment, but it is administratively and financially independent. Stakeholders have a strong say in decision-making on water resources management matters through the

Water Resources Civil Organisations (CWO), which has a seat in the NCWR. The CWO is made up of representatives from the river basin associations, water user associations, technical or academic or research organisations and NGOs. Malaysia does not have a national water resources agency yet, although it has a NWRC that provides policy directions, but not in terms of implementation.

(d) Management of water resources in Brazil at the local level is through the River Basin Committees (RBC). Although the RBCs have no legal status, their memberships are from the Federal Government, the States, the Federal Districts and stakeholders, and their roles are to discuss and decide on measures and solutions to protect the water resources in their river basin regions.

(e) The actual implementation work at the local level is through the River Basin Water Agencies (RBWA) that acts as the executive secretariats of the RBCs. There are some similarities in structural features and functions between the RBWA and LUAS in Selangor and NREB in Sarawak (in terms of using river basin authorities/boards) but the hierarchy of implementation arrangements are slightly different to that in Malaysia.

(f) Among the specific functions of the RBCs in Brazil are:

- The systematic management of water resources, including aspects of quantity and quality;
- The adaptation of the management of water resources to the physical, biological, demographic, economic, social and cultural needs of the country's various regions;
- The integration of management of water resources with environmental management;
- The coordination of water resources planning with regional, State and national planning;
- The coordination of water resources planning;
- The coordination of water resources management and soil use; and
- The integration of watershed management with the management of river and coastal zone systems.

(g) The above provisions commit the Brazil Federal Government in its cooperation with the State Governments and Federal Districts to manage water resources as a joint interest. It uses six governance instruments to carry this, namely, water resources plans; the classification of bodies of water by types; award of user rights; charges for use; water resources information systems; and capacity building.

(h) The provision of the National Water Resources Management System (NWRMS) created under the Brazil Water Resources Policy is interesting. It focuses on the coordination of IWRM in the country; the provision of an

administrative arbitration mechanism over disputes relating to water resources, planning, regulating and monitoring use, preservation and recovery of water resources, and the application of charges for use of water resources.

(i) The NWRMS seems to be an over-arching institutional mechanism as the memberships are made up of representations from the NCWR, State and Federal District Water Resources Councils, Watershed Committees, agencies of the Federal, State and municipal authorities with jurisdiction over water resources management. It sets out mandates for each entity that forms the system, and it also takes in civil organisations that are legally organised. The institutional structure of NWRMS is summarised below:

- The Federal Executive Branch is responsible for taking measures necessary for implementing and operating the NWRMS; granting usage rights for water resources, and regulating and monitoring use within its area of authority; implementing and managing the water resources information system on a national scale; and promoting integration of water resources management and environmental management.

- State and Federal District Executive Branches are responsible within their areas of jurisdiction for granting rights for water resources and regulating and monitoring their uses; maintaining technical control over water supply works; implementing and managing the Water Resources Information System within the State and Federal District environment; and promoting IWRM and environmental management.

- Executive Branches of the Federal Districts and Municipalities promote the integration of local policies for basic health, use, occupation and soil and environmental maintenance with Federal and State water resources policies.

(j) The approach taken by Brazil in the administration of the water sector is inclusive, as there is no separation of water services from water resources functions. The policy and institutional structures are highly skewed towards the IWRM approaches as it includes all the human and physical environments in the river basins. Malaysia can emulate this to fast forward the implementation of the IWRM through the Federal, State, District and Municipality levels in the country.

(v) France

(a) The French institutions in charge of water management have been organised since 1964 on the principle of IWRM at the river basin level. The country is divided into six large basins or hydrographical districts following the European Union Water Framework Directive (EUWFD), which it adopted in

2000. In each river basin, a Water Agency is created to administer water in the river basin district.

(b) In each Water Agency, a Basin Committee is formed whose membership consists of regional, departmental and municipal authorities (has two seats out of five seats in the Committee); representatives of the State department concerned with water (one seat); and delegates from the main water users in the basin from associations representing the farming, industrial, anglers and environment communities (two seats), altogether totalling five seats. These Basin Committees play a vital role in water management and are sometimes referred to as forming the water 'parliament'. It is an interesting example where the water sector (although mainly for water services), is taken to the level where there is strong participation from the public, private and stakeholders in decision-making, with a very compelling voice in planning details at the local and regional levels, which at times are in confrontation with the central government.

(c) The French Water Act 1964 provides for the central administration of water of which there are many tiers of representation. The municipalities are responsible for water services, the production and supply of drinking water and the collection and treatment of wastewater. It is therefore also responsible for water quality and pricing.

(d) The mayor of the municipality is technically in charge of such water-related matters. Most of the decisions on water-related matters however rest with the water assembly formed in the municipality, with memberships consisting of representatives from the rural and urban associations. Elected members from these water assemblies then represent their municipalities in the local council, which has the powers to decide upon the delegation of the water service to a private company.

(vi) United Kingdom

(a) The United Kingdom consists of four countries (England, Wales, Scotland and Northern Ireland) where the legal and institutional arrangements in water management are the same for England and Wales, but differ in Scotland and Northern Ireland, which have developed separate arrangements.

(b) The water management institutional structures have evolved through a series of reforms over 150 years. In 1974, by a major re-organisation, 10 regional water authorities were formed along major river basin areas. These are autonomous non-government organisations and are responsible for water services including wastewater collection, treatment and pollution control.

(c) In 1989, the UK Government privatised the water services functions of the above mentioned authorities, creating ten private water services companies responsible for providing water and wastewater services. In addition, there

were already 21 statutory water companies in England and Wales, which supply drinking water to areas within the region covered by the major water services companies, but are not involved in wastewater disposal.

(d) In the same year, 1989, three new regulatory organisations were setup, namely, the National Rivers Authority (NRA), the Office of Water Services (OFWAT) and the Drinking Water Inspectorate (DWI). The NRA is responsible for managing surface and groundwater resources and the licensing of abstraction and discharges. The OFWAT sets the price limits within which companies may charge their customers and achieve the level of service laid down in the license (similarities with SPAN in Malaysia). The DWI is responsible for auditing the performance of the water companies in meeting the requirements of the drinking water regulations.

(e) The system adopted specifically in England and Wales is characterised by a clear separation of the regulators from the regulated. Prior to 1989, the regional water authorities were major polluters, acting not only as operators of sewage treatment works but were also responsible for enforcing effluent discharge including their own and those of the industry. This has often led to unfair practices and inconsistencies in enforcements. The separation of powers in the water sector is now much more organised, with the Environment Agency as the regulator, and the water industries and companies, being the regulated.

(f) In terms of functions, the NRA provides a central mechanism for integrated river basin-based water management from source to the sea. As a third of the drinking water is abstracted from lowland surface water sources for public water supply, river basin management has been practised for more than 60 years. River basin management plans have been prepared for most of the rivers by the NRA and these plans have now been extended into Local Environment Agency Plans (LEAPs) (something similar to river basin management plans in Malaysia) to include wider environmental considerations in water management. These plans are now being used to balance the needs of the different landuse and water resource users including the environment within a river basin. These LEAPs are not legally binding but they provide the framework for systematic management of water resources in the river basin.

(vii) Japan

(a) Japan has very little water resources because of its topographical features where the rivers are short and runoff is very rapid. It therefore places a very high emphasis on preserving its water resources. The national Government is responsible for formulating and implementing water resources policies at the national level, the administration of waterworks and the protection of water quality. It has five related Ministries (Ministry of Land, Transport and Infrastructure; Ministry of the Environment; Ministry of Health, Labour and

Welfare; Ministry of Economy, Trade and Industry; and Ministry of Agriculture, Forestry and Fisheries) taking charge of the various administrative areas and cooperate with each other to formulate water-related policies.

(b) The national Government takes charge of overall planning of both water resources development and environmental conservation. The Comprehensive National Water Resources Plan, also known as the Water Plan, is the national basic plan for water resources development under which dams and water systems are developed. It is developed by the Ministry of Land, Transport and Infrastructure in accordance with the Comprehensive National Development Plan (similar to the Malaysian Five-year Development Plans) and approved by the central Government.

(c) The Water Plan is a multi-year plan in that it addresses basic medium to long-term planning issues regarding water resources development, conservation and utilisation and water demands. The water-related ministries use the Water Plans to develop annual development plans and their related budgets. In addition to the Water Plan, there is the Basic Environmental Plan which provides the long-term, comprehensive environmental policies related to water quality and quantity including water conservation.

(d) The Local governments take charge to operate, maintain and manage domestic, industrial and sewerage water utilities and related facilities. The local governments also continuously monitor public water quality and supervise private entities to ensure that wastewater effluent standards are being met.

4.5 REVIEW OF MALAYSIAN INSTITUTIONAL ARRANGEMENTS IN WATER MANAGEMENT

4.5.1 Review Context

A diverse range of relevant documentary sources has been reviewed and of these, two main documents have been singled out to provide the historical baseline information to help shape our recommendations of the proposed institutional approach in this Study. These are the National Water Resources Study, Malaysia (JICA, 1982) and previous NWRS (2000). An overview of the recommendations from these two nation-wide studies will provide a perspective on how the current situation may have been influenced by these two documents to meet escalating water demands; the need for conserving water for nature and the environment; and the rationale for water reforms to meet these demands and commitments. The format of review is only centred on the institutional arrangements in terms of the organisational structure, roles and responsibilities of the organisations.

4.5.2 National Water Resources Study, Malaysia (JICA, 1982)

(i) The JICA Study of 1982 focused on water resources development and management to achieve greater national socio-economic efficiency. It noted that there was a lack

of an institutional arrangement to coordinate the various sectoral activities in the field of water resources. As a response to this shortcoming, the Study recommended an institutional arrangement with an organisational structure at both the Federal and State levels.

(ii) Specifically, the JICA report recommended the formation of the National Water Resources Council (NWRC) at the Federal level with corresponding State Water Resources Councils (SWRCs) at State level. It proposed that the NWRC be constituted along similar lines as the National Land Council or alternatively, as a National Water Resources Commission to accord greater executive powers to the entity.

(iii) To support these two councils, the Study recommended the creation of Water Resources Divisions, at both the Federal (Federal Water Resources Division - FWRD) and State levels (State Water Resources Divisions, SWRD's). These divisions would then coordinate and supplement the functions that were undertaken by institutions, which were perceived as being independently planned and sectorally-driven (refer to **Annex 4.3**).

(iv) JICA further recommended the establishment of a Water Resources Development and Management Corporation (WRDMC) at the Federal level to act as a development arm for implementing water-related projects of the central government. A list of proposed projects for implementation was provided by JICA in their Report.

(v) To facilitate decision-making, the JICA report suggested that the NWRC should preferably be chaired by the Chief Secretary to the Federal Government, and that at State level, the SWRC chairperson should be the State Secretary who should also be a member in the NWRC.

(vi) As an aid to water resources governance, the JICA Study recommended the enactment of a National Water Resources Code by which Federal and State coordination could be integrated in the planning, operation and management of water. This was deemed necessary and urgent as the Study viewed that the entire range of water matters could not be dealt with by the States alone, and that there should be clear directions for interactions between Federal, State and Local Governments in terms of jurisdictional, institutional arrangements and financing.

(vii) The JICA Study did not make a clear distinction between water resources and water services. The Study instead focused very heavily on the development and management of water infrastructure for operating delivery services to the various water users. This was reflected quite clearly in their proposals for institutional re-arrangement and organisational re-structuring.

(viii) It is interesting to note that many of the JICA recommendations were re-stated again in the previous NWRS (2000) report and some of the recommendations have in fact been implemented such as the establishment of the NWRC and SWRCs, although

the functions of these institutions were amended to suit the circumstantial situations in the States with the passage of time.

4.5.3 Review of Recommendations in the Previous NWRS (2000)

(i) The previous NWRS (2000) report was a refinement of the JICA Study. It was carried out more than a decade ago, commissioned by the Federal Government in 1998 to undertake the planning, development and management of the water sector in the immediate, medium and long-term time horizons.

(ii) One of the important outcomes of the previous NWRS (2000) amongst others, was a recognition that the institutional arrangements for the water sector were too fragmented, involving too many departments and agencies which operated independently of one another according to specific responsibilities and legal provisions, thus not providing an institutional context for integrated management. It recognised that this situation, if it were to persist, could have dire consequences in terms of coordination and consultation, resulting in duplication of functions, competition and conflict in the scope of work. It therefore recommended two institutions to overcome these problems as mechanisms for coordination and integration of functions and responsibilities in the water sector. These institutions were the NWRC and a NWRD to serve as a secretariat to the NWRC (**Table 4.1**).

(iii) As can be seen in **Table 4.1**, the above two recommendations were similar to the ones recommended in the JICA Report (1982), which proposed the establishment of a NWRC and a National Water Resources Division (called the NWRD in the latter Study, see **Annex 4.3**). As the Study was geared towards water services, and water supply and distribution, rather than water resources, it was also in favour of public–private arrangements in the development and management of water. Since both studies saw the need for an over-arching entity with a technical agency to support the entity, they could well be the types of unifying imperatives amongst others, for instituting water sector reforms. This aspect is examined in more detail in our Study especially in terms of the roles and functions of these two entities.

Table 4.1 - Summary of Institutional Functions of Agencies Recommended in the Previous NWRS (2000)

Institution	Functions
National Water Resources Council (NWRC)	• Resolution of water resources disputes between States including establishment of a mechanism for agreeing terms; • The coordination of river basin development to facilitate inter-basin and inter-state water transfers; • Management on a national basis to ensure long-term sustainability of water supply; • Addressing the legal and other issues needed to allow for increased use of water through inter-basin and inter-state water transfers. <u>Added on:</u> • Advising the State Governments on the preservation of water supply catchment areas; • The gazettement and coordination of river basin development and facilitation of inter-state water transfers; • Co-ordinating water resources development projects; • Water resources data management; and • Basin management on a national basis to ensure long-term sustainability of water supply.
National Water Resources Department (NWRD)	• Provide Secretariat support to the NWRC; • Prepare long-term water resources plans; • Determine Federal financing requirements; • Determine water-use priority, demand management and tariff policies; • Establish policies and procedures and legal provisions; • Co-ordinate inter-basin development and management plans.
State Water Resources Council (SWRC)	• Governance of the State Water Resources Corporation; • To consider and approve policies pertaining to allocation, water use priority, flood mitigation planning, catchment management, river corridor environment management and land use; • To approve long-term river basin policies, water resource master and development plans; • To consider and approve water pricing policies; • To represent the state at the NWRC meeting.

Table 4.1 - Summary of Institutional Functions of Agencies Recommended in the Previous NWRS (2000) (cont/-)

Institution	Functions
State Water Resources Technical Committee (SWRTC)	• To promote and implement rational management of water resources of river basins through integrated and co-ordinated planning of water resources development; • To prepare the long-term and the five year basin water resources development and management master plan for each river basin; • To establish procedures to determine water-use priorities during period of inadequate water supplies due to drought or other causes; • To establish guidelines and procedures for the prevention and control of flooding, soil erosion, river siltation and damage to catchment area; • To formulate policies and review legal provisions for the management of river basins; • To coordinate and integrate the different development and management plans and projects of the various departments and agencies within the basin; • To coordinate landuse planning and landuse changes within the river catchment.
State Water Resources Corporation (SWRCorp)	• Preparing the State Water Resources Master Plan; • Secretariat to support the SWRC; • Under a contract for service with the State Government, to undertake management of all state water functions; • Under a contract for service with the private sector water supply operators, provision of raw water supplies; • Management of State owned assets to obtain adequate financial returns on State investment.
State Water Regulator	• Advise the state government on all private sector contracts with corporatised service agencies and privatised service agencies; • Implementation of the privatisation process; • All legal issues; • Liaison with SWRCorp for supply of raw water; • Liaison with consumer stakeholders; • Independent overseeing of Master Plan Implementation.

4.5.3.1 Role and Function of National Water Resources Council (NWRC)

(i) The NWRS (2000) stated that there had been little change in the legislative and water resources administration in Malaysia since the JICA Report (1982) and the FAO Report (1983) up to 2000, except in the area of environmental protection. It supported very strongly the setting up of the NWRC, spelling out the functions of the NWRC as shown in **Table 4.1**, where the functions were similar to those proposed in the JICA Report.

(ii) The NWRC was meant to be a high-powered institution with the Prime Minister as its Chairman, and members comprising the *Menteri Besar/* Chief Ministers of the respective State Governments, Ministers from the relevant

Ministries, and representatives from various Federal Government agencies that are involved in the water sector.

(iii) Accordingly, the previous NWRS (2000) also stated that some form of water sector reform was needed in the short and medium term as all States were planning to establish the State Water Resources Council/State Water Resources Technical Committee (SWRC/ SWRTC) to address the water sector in a more integrated manner. (*This aspect of water sector reform was not stated in the JICA Report*). Thus, between 1998 and 2000, there were some additional specific functions recommended for the NWRC to oversee (see **Table 4.1**). Included in the additional functions were to ensure agreements in inter-basin water transfer projects, especially to address the legal issues. This is to facilitate inter-basin and inter-state water transfers and international water resources obligations and commitments.

4.5.3.2 Role and Function of National Water Resources Department (NWRD)

At the Federal level, the previous NWRS (2000) recommended that the NWRC be supported by a NWRD headed by a Director-General with the NWRD having the functions of a secretariat to the NWRC to prepare long-term water resources plans; determine financing requirements; prioritise water usage; management of demands; and set tariff policies; provisions of procedures; management plans and legislative arrangements; as well as co-ordinate inter-basin development. (*Unfortunately, most of the recommendations, although very sound, were not implemented to the anticipated level because the NWRD was never formed and instituted*).

4.5.3.3 Role and Function of State Water Resources Department (SWRC)

(i) At the State level, the previous NWRS (2000) recommended the setting up of a corresponding SWRC, where the functions are similar to those mentioned at the Federal level but with the added function of governance of any State Water Resources Corporations that have been formed at the State level. The recommended functions include: to approve policies pertaining to water allocation; flood mitigation planning; catchment management; river corridor environment management and land-use; and to represent the State at the NWRC meetings. (*These functions were nearly similar to those recommended in the JICA Report and some were implemented at the State level in some states*).

(ii) The SWRC structure is also high-powered as it was recommended that the chairman be the *Menteri Besar* / Chief Minister, with members consisting of the State Secretary, State EXCO Member for Infrastructure, State EXCO Member for Science, Technology and Environment, State Economic Planning Unit as Secretary of the SWRC, representatives from the State Water Corporation/Board, Land and Mines Department, Department of Environment, all Local Authorities, State Water Regulator, State Legal

Advisor, Department of Irrigation and Drainage, Forestry Department and Town and Country Planning Department.

4.5.3.4 Recommendations for Water Sector Reforms in Previous NWRS (2000)

(i) To reform the water sector mainly for water services and delivery, the previous NWRS (2000) developed two options, namely:

(a) The improved Status Quo (ISQ) model; and
(b) The Corporatisation/ Privatisation (CORPRI) model.

(ii) The previous NWRS (2000) viewed the ISQ model as a logical step towards the final CORPRI model in the water sector reforms. It proposed that the functions of the NWRC, mentioned earlier, be expanded to oversee water entities through the formulation of the national water policy and water resources master plans for the States and Federal Territories, and to provide guidelines on priority of water-use especially during droughts.

(iii) Some of the recommendations of these two models have since been implemented in the last decade especially in the water supply and delivery sectors and projects for inter-basin and inter-state water transfers. For example, the inter-state water transfer from Pahang to Selangor is such a scheme that has made substantial progress particularly in terms of implementation since the recommendations in the previous NWRS (2000). In terms of institutional arrangements, where most of these projects are administered in the form of privatised or corporate structures, any future arrangements will have to recognise the existence of these privatised contractual agreements entered into by the Federal and State Governments.

4.6 PREVIOUS NWRS (2000): ACHIEVEMENTS IN WATER SECTOR (as at 2010)

(i) In the last decade after the previous NWRS (2000) report, the process of institutional change in the water sector has gone on perceptibly, mainly through advocacy on capacity building and awareness creation within and among the water-related institutions. The current decentralisation of functions among the various water–related agencies is however still one of the key challenges with regards to having an integrative institutional arrangement for water resources governance that can be both unifying and yet not devolving any of the functions of the existing institutions.

(ii) One of the key pre-requisites is to determine how water as a resource can be managed effectively at the national and State levels, and what building blocks are required for an institutional structure that can function in a pragmatic manner within the confines of the Constitution. The previous NWRS (2000) period saw many State Governments coming out with a variety of water service models (privatised or corporatized) for purposes of abstracting, treating and delivering water to consumers. Managing water as a resource is considered a secondary add-on effort by the concessionaires and service providers.

(iii) Among the options considered for institutional reform during the previous NWRS (2000) period, was a proposal to set up a **Water Resources Ministry** for integrated water resources management in the country. Such a Ministry was seen to be able to play a centralised management role to ensure that all legitimate water users in the country have access to water on a fair and equitable basis. There was also a proposal to set up a **Department of Water Resources Management** to provide the necessary technical support to the Water Resources Ministry. Although these options were not realised, there has nevertheless, been some semblance of a movement towards this direction when the service delivery sector was separated from the water resources sector in 2004 after the Cabinet reshuffle that created two Ministries, namely KeTTHA and MoNRE. This separation of functions is a landmark achievement because it recognised that water is a national asset and has to be managed efficiently on a neutral platform, and is perceived by many in the water sector as the right direction to take.

(iv) The Federal and State Governments have since implemented many projects recommended by the previous NWRS (2000), with some of the projects being in the process of implementation at the time of this present Study. Of significance is the formation of the NWRC in 1998 and some SWRCs at State level, such as in Selangor, Kedah, Sabah and Sarawak. In many respects, these structures, (NWRC and the SWRCs) are the building blocks in the institutional governance framework that will likely gain momentum in all the States in future.

(v) The NWRC has been in existence for more than a decade now. It is the only identifiable so-called over-arching entity or apex body that serves as the co-ordinating institution in water resource governance, as it was chaired by the Prime Minister himself until 2009, when the chair was handed to the Deputy Prime Minister. Unfortunately, the NWRC is not mandated by legislation and is serving only as an advisory body, where the States can choose not to follow.

(vi) Meanwhile, a number of States such as **Selangor, Johor, Pahang, Pulau Pinang, Melaka, Negeri Sembilan, Kedah, Sabah and Sarawak**, have progressed forward to institute developmental changes in their water sector. These were generally designed to meet escalating domestic water demands and to mitigate the impacts of floods, droughts and pollution that are becoming increasingly a hindrance to the developmental aspirations of the State.

(vii) In terms of legislative positions in the previous NWRS (2000) period, the various States and Federal Territories can be grouped according to five (5) categories as follows:

- Category 1 where an enactment for water resources exists, i.e., Selangor, Kedah and Sabah are included;
- Category 2 where there is an enactment mainly pertaining to water services,

i.e., Pahang, Negeri Sembilan, Melaka and Sarawak;

- Category 3 is where the Waters Act 1920 still applies, e.g. Perlis, Perak, Pulau Pinang, Kelantan, Terengganu, Johor and FT of Kuala Lumpur;
- Category 4 applies to the FT Labuan which does not have any legislation regarding water; and,
- Category 5 applies to the FT Putrajaya which has a specific Municipal By-Law for Control of Activities in Putrajaya Lake.

(viii) Some other building blocks in the institutional arrangements are the provisions for institutional and human resources capacity building through formal and informal educational systems, stakeholders' participation, information systems, environment and health, and the international protocols and treatises that the country has ratified and is responsible for. All these are pre-requisites that have been taken into consideration in the proposed institutional arrangement at National and State levels.

4.7 SEPARATION OF RESPONSIBILITIES IN THE WATER SECTOR

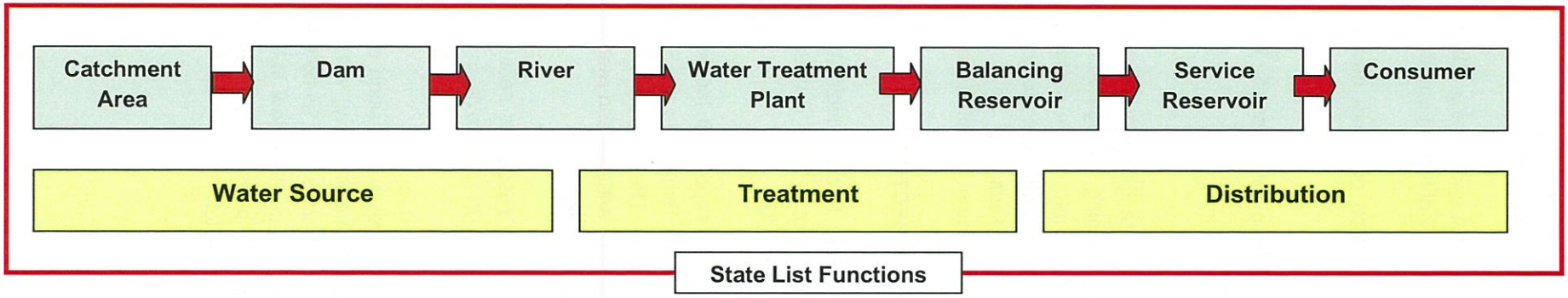
(i) There is separation of functional responsibilities through legislation following the water sector reforms in 2004. The water sector is now divided into the *water resources* and the *water service* sectors (**Figure 4.1**).

(ii) As shown in **Figure 4.1**, the situation after the separation leaves a large gap in administration of water, where the source of water remains in the State List, and the water service sector is in the Concurrent List. The source of water (or water resources) is directly under the States with State mandates and responsibilities, each with different models of administration as seen above.

(iii) Our Study is therefore concerned with the water resources sector. If water is not conserved and sustained, there will be problems in the provisions of water to the water service sector.

(iv) In terms of administrative responsibilities therefore, a discussion of the institutional arrangements for water resources (the subject of this Study) will not be complete without a discussion of the same for the water service sector as both are very closely linked, and one depends on the other. The sections below will provide a brief overview of the organisational structure and responsibilities in the water service sector and its linkages with the water resource sector.

(a) Water Sector before Water Services Industry Act 2006



(b) Water Sector after Water Services Industry Act 2006

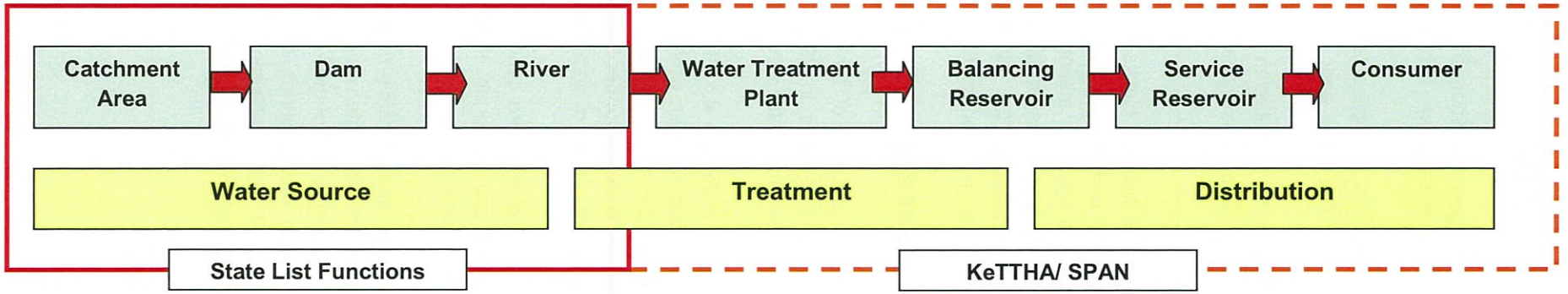


Figure 4.1 - Water Sector Reform

4.7.1 Empowerment in the Water Services Sector

(i) The water services sector is legislated starting with an amendment to the Federal Constitution transferring the water services and supplies from the State List to the Concurrent List (gazetted on 10th February 2005), to enable the Federal Government to regulate water services. The subsequent passage of the Water Services Industry Act 2006 (Act 655) (WSIA) provided the mandate for the water services industry to operate, from treatment of raw water to discharge of wastewater. In the same year, the National Water Services Commission Act 2006 (Act 654) was also passed to establish a national regulator (SPAN) for the water services industry and to implement and enforce the provisions of the WSIA.

(ii) By legislative mandate, an institutional structure was formed whereby all water operators and water asset owners are regulated by SPAN through a licensing framework. To streamline the administration in the water services sector, it clearly separated the role of water operators from water asset owners. To carry this out, it formed the Water Asset Management Company - Pengurusan Aset Air Berhad (PAAB) to take over all water services assets owned by the States in exchange for absorbing all outstanding loans and freeing the service operators to concentrate on service delivery. With this creation, the Federal Government now provides loans only to Sabah and Sarawak and not to the other States for the development of water services infrastructure.

(iii) The responsibility to finance and develop new water infrastructure in the States in Peninsular Malaysia is transferred to the PAAB. As a Government-owned company, PAAB is eligible for more favourable financing rates, which can translate into better tariff rates to consumers. The water infrastructure will be leased to the water operators for operation and maintenance. The separation of ownership from the operation of water infrastructure is aimed at driving the industry towards financial sustainability as well as better service efficiency. The setting of water service tariffs is based on uniform principles and procedures and is subject to approval by SPAN.

(iv) The whole administrative structure reflects an empowerment system that is geared towards water financing economy, whereby it looks at water as a commodity facilitating and promoting efficiency in water supply and sewerage services in the country. The long-term focus of this is on promoting economic returns on investment. SPAN itself does not promote privatisation of water services but instead promotes corporatisation of State Water Authorities to enable them to operate as efficient corporate entities, and to ensure that revenues generated from water service operations are reinvested back into the water supply sector.

(v) In terms of organisational structure, SPAN has a Committee where the members are appointed by the Minister of KeTTHA. The Committee consists of the Chairman, the Chief Executive Officer, and not less than eight and not more than 10 other persons, who, in the opinion of the Minister, have experience and have shown capacity and professionalism in matters relating to finance, engineering, business or administration, or have special knowledge and experience.

(vi) The mandate and responsibilities of SPAN are shown in **Annex 4.4.** The mandate and responsibilities of SPAN go beyond its regulatory role in the water and sewerage services industry. It has licensing and technical regulatory roles. In terms of water resources and the environment, it has responsibilities to: promote protection of water-courses and the environment; and improve the quality of life and the environment through effective and efficient management of the water supply and sewerage services sector.

(vii) The overall institutional arrangement of the water service sector in relation to the Federal structure is shown in **Table 4.2.** It is clear that it sees the NWRC as an appropriate entity to look after water resource matters such as cross-boundary and inter-state issues of national interest and to ensure coordination with the States in the management of river basins.

Table 4.2 - Institutional Responsibilities in the Water Services Sector

Body	Area for Responsibility	Description
Federal Government (KeTTHA)	Policy matters	Development of a holistic water policy for the country by setting policy directions
State Government	Raw water matters	Regulate raw water abstraction and catchment management
National Water Resources Council (NWRC) – chaired by Prime Minister/Deputy Prime Minister	Water resources matters – Cross boundaries/ inter-State/ Issues of national interest	Ensures coordination with the various State Governments in the management of water resources
National Water Services Commission (SPAN)	Regulatory matters	Regulate the Water Services Industry (Water and Sewerage services)

4.7.2 Empowerment in the Water Resources Sector

(i) The aforementioned institutional arrangement in the water services sector has revealed that there are no similar structures for the water resources sector at the Federal level. It is left only to the State level because of the Constitution. Currently, there is no mandate for the creation of a specific entity to take charge of water resource matters at the Federal level. Hence, it is one of the main challenges to come up with an institutional arrangement that is acceptable by the stakeholders at the State level, since water is in the State List, although the Federal Constitution has provisions for Federal involvement as was highlighted in Sections 4.2 and 4.3 of this Volume.

(ii) At the Federal level, there are also other problems associated with water resources management. Although MoNRE is entrusted to look after water as a resource, the administration of water is taken up by a number of agencies and Ministries as shown in **Table 4.3** (a more detail description of the functions of the Ministries and agencies

related to water is provided in **Annex 4.5**). Because of the need to sustain water resources for the water services sector and for national security, there is a need to centralise the responsibilities of managing water resources to a central entity at both levels of government, that is, at the Federal and State government levels (see the gap in the water sector reforms in **Figure 4.1**). It is on these grounds that the institutional arrangements for water resources are proposed in this Study (see also Section 4.8) as there is yet to be a formalised arrangement for water resource management.

(iii) The institutional arrangement for the water resources sector is based on the three main elements of institutional arrangements as in the water service sector, namely; the mandate, the organisational structure and the responsibilities or functions.

(iv) As indicated above, the mandate through legislation will come after this Study. The recommended organisational structure and the responsibilities are provided in Section 4.8. Prior to the recommendations, the sections below will first examine what structures we have in terms of the current situation and to propose appropriate options for the water resources sector at Federal and State levels in accordance with the draft NWR Policy and draft NWR Law.

Table 4.3 - Some Functional Responsibilities of Water Related Agencies/Bodies

FUNCTION / DEPARTMENT/AGENCY	Water Supply	Water Sanitation	Irrigation	Hydropower	Flood Control	Water Quantity Regulation	Water Quality Regulation	Watershed Management	Integrated Area Development	Data Collection	Research	Ports and Navigation	Fisheries	Recreational
Economic Planning Unit								■	■					
Ministry of Natural Resources and Environment					■	■	■	■	■	■	■			■
Department of Irrigation and Drainage					■	■		■		■	■			
Department of Environment							■	■		■	■			■
PERHILITAN								■		■	■			■
NAHRIM										■	■			
Forestry Department, Peninsular Malaysia								■		■	■			
Department of Director of Lands and Mines									■	■				
Jabatan Mineral dan Geosains	■					■				■	■			
Marine Park Department									■	■	■			■
Ministry of Energy, Green Technology and Water	■	■		■						■	■			
SPAN	■	■												
Water Supply Department	■													
Sewerage Services Department		■												
Ministry of Agriculture and Agro-based Industry			■							■	■		■	■
Department of Agriculture			■							■	■			
Fisheries Department										■	■		■	■
Ministry of Housing and Local Government							■	■						
Ministry of Health							■			■	■			
Ministry of Rural and Regional Development	■	■												
Ministry of Works						■								
National Water Resources Council	■							■						
Tenaga National Berhad				■						■	■			
Ministry of Transport												■		
Marine Department Malaysia												■		

4.7.3 Current Institutional Arrangements Among States

(i) There are currently four categories of institutional arrangements (mainly from the water services sector arrangements and State water arrangements) among the States (**Table 4.4**). These groupings are basically a reflection of the organisational structures and areas of responsibilities.

Table 4.4 - Categories of Institutional Arrangements in Malaysia

CATEGORY	INSTITUTIONAL ARRANGEMENTS	STATES	REMARKS
1	Fully developed and implemented	Selangor (LUAS), Sabah, Sarawak	Fully functional with institutional structures addressing or aiming address most aspects of water resources management.
2	Developed and/or need refinement and/or to be implemented	Kedah (LUAN), *1Pahang *(Kelantan, Terengganu, Negeri Sembilan)*	All have been mandated by legislation but institutions are not yet fully functional. Kedah is more developed than the rest in this Category as it has a specific structure for water resources management. The States in italics are in both Categories 2 and 3 because their legislations have taken into consideration the water resources components, eventhough they are mainly service-oriented agencies.
3	Service-oriented and industry-based or distribution-based	*2Melaka *3Johor *4*Negeri Sembilan* Perak *Kelantan* *Terengganu* Pulau Pinang Sarawak	Development through corporatisation and/or privatisation approach (CORPRI). Negeri Sembilan has enacted legislation for water services (2009)
4	None of the above, or preparations are underway for an arrangement	Perlis FT Kuala Lumpur FT Putrajaya FT Labuan	No provisions yet except in FT Putrajaya Syarikat Air Perlis has recently signed an agreement with PAAB regarding water assets (2010)

*1 BAKAP – Badan Kawal Selia Air Pahang
*2 BAKAM – Badan Kawal Selia Air Melaka
*3 BAKAJ – Badan Kawal Selia Air Johor
*4 BAKANS – Badan Kawal Selia Air Negeri Sembilan

(ii) Institutions in Category 2 can migrate to Category 1, when the State Water Enactments are amended to take into account water resources as part of their portfolio responsibilities where presently some of the enactments focus mainly on water services alone.

(iii) **Category 1:** This category consists of State institutional arrangements that have been fully developed to cater to water services and water resources, functioning and legislated by state enactments. The structures in this category can still be evolving but in practice, they have already been implemented. An example of the Category 1 model is the LUAS structure (shown in **Annex 4.6 - Figure A4.6.1**). LUAS is fully mandated through legislation with an organisational structure in regulating and managing their water resources using the river basin approach. This category also includes Sabah (**Annex 4.6 - Figure A4.6.2**) and Sarawak (**Annex 4.6 -Figure A4.6.3**) where they also have clearly defined structures. If at all, any recommendations for this category maybe purely to refine their functions and responsibilities, and where specific functions for water resources management are not yet undertaken by the existing entity, to recommend that such functions are undertaken by a relevant entity. Following this, it maybe that a merging of entities could occur in order to better promote uniformity of approach and integration of operations in order to maximise resource inputs in future. However, such an option is at the prerogative of the State. At this point in the discussion, it should be noted that there are currently two key entities at State level performing various functions in IWRM. The other is the State DID.

(iv) There is one aspect that is of concern and that is in the area of institutional capacity building with corresponding manpower development to manage water resources, especially at the State level. Often, there is not only a shortage of manpower at this level, but also unmet training needs for them to perform their job functions effectively to achieve IWRM. Funding is another area of concern. Funding will be necessary for maintaining the water source areas, the environment and the river basins that provide the water for the water services sector. Without all these, the effectiveness of managing and sustaining water resources through these institutions will be compromised even though the institutional arrangement seems quite clear and beneficial.

(v) **Category 2:** This category consists of States that have the mandates from the State enactments, but have yet to fully implement the provisions of the enactments. In Kedah for example, the Kedah Water Management Board (LUAN) (**Annex 4.6 - Figure A4.6.4**) was formed from the provisions of the Kedah Water Resources Enactment, 2008. However, it has yet to be fully functional, although it has clearly a well-defined institutional structure looking after most aspects of water and water resources in the State using the river basin approach similar to LUAS. As of July 2010, LUAN was officially established, but is still in the process of building up its manpower and operational capacity and thus, it will take some time to become fully functional.

(vi) Pahang has the Water Resources Enactment, 2007, but has no provisions for an authority to look after water resources, except the provisions for appointing a Water Resources Director to oversee water resources management (**Annex 4.6 - Figure A4.6.5**). It does not have as yet a full-fledged institutional structure in place. In its stead, water resource management is under the State Secretariat of which there is a State Water Regulatory Body (Badan Kawal Selia Air Pahang, BKSAP), which is

divided into three main units; the Administration Unit, Water Catchment Unit and Water Quality and Water Resource Management Unit.

(vii) The States of Kelantan, Terengganu and Negeri Sembilan, which are mainly in Category 3, can also be placed in Category 2 because their legislation are more related to management of water resources and river basin management, but in terms of functions, they are more akin or focused on the water services sector.

(viii) **Category 3:** The third category consists of States having mainly the service-oriented and industry-based or distribution-based institutional arrangements developed mainly on a sectoral basis for water abstraction, treatment, water asset management or distribution of water in the water service sector. Many States have such institutions, such as Johor (SAJ) (**Annex 4.6 - Figure A4.6.6**), Kelantan (**Annex 6 - Figure A4.6.7**), Melaka (SAMB) (**Annex 4.6 - Figure A4.6.8**), Negeri Sembilan (SAINS) (**Annex 4.6 - Figure A4.6.9**), Pulau Pinang (PBAPP) (**Annex 4.6 - Figure A4.6.10**), Perak (LAP) (**Annex 4.6 - Figure A4.6.11**), and Terengganu (SATUWATER) (**Annex 4.6 - Figure A4.6.12**).

(ix) Sarawak is in both, Categories 1 and 3, because of the service delivery functions as well as water resources functions. It is anticipated that some States may follow the example of Sarawak to have both functions; that of water services and water resources, covered in the administration at the State level. In this Category 3, the structures depend on the types of activities and functions, but most of them, being service–oriented follow either a corporate or privatized structure.

(x) **Category 4:** The fourth category has none of the above features. However, their institutional arrangement is part of the Federal Government line agency structures directly under the Federal and State governments. Water supply in Perlis for example is under the State Water Supply Department and drainage is under the DID, pollution of water is under the DOE and local government (**Annex 4.6 - Figure A4.6.13**).

(xi) The three Federal Territories of Kuala Lumpur (**Annex 4.6 - Figure A4.6.14**), FT Putrajaya (**Annex 4.6 - Figure A4.6.15**) and FT Labuan (**Annex 4.6 - Figure A4.6.16**) have similar line agencies with similar functions but with some modifications.

(xii) Clearly from the above, different States have different approaches and arrangements of varying subject scope in managing their water resources, due largely to the water reforms of the post NWRS (2000) period. Currently, nearly all the States are brought under the umbrella of the water services sector through policy and legislation at the Federal level (the latest was Perlis) through SPAN and PAAB, and are purely service-oriented.

(xiii) In the water resources sector, there are many States that are still debating on the types of model to follow. Some States are looking at the LUAS model while others are studying the Sabah, Sarawak and Kedah models. Whichever model is chosen, the institutional structure will depend very much on the priorities given to the two

water sectors by the State Governments, and these will be spelt out as provisions in their State enactments. The linkages among different departments within the States and the Federal Government in the diagrams in **Annex 4.6** are provided to show the flow of responsibilities of the water agencies that have been set up, or are in the process of being set up in the States.

(xiv) A summary of the agencies in the eight Ministries in Peninsular Malaysia that have direct and indirect dealings with water management with flows of line agencies are provided in **Annex 4.6 – Figure A4.6.17**.

4.8 RECOMMENDATIONS FOR INSTITUTIONAL ARRANGEMENTS

(i) **Current Situation**: The institutional arrangement between the Federal and the States in terms of water resources management is fragile to the point of being tenuous in terms of sharing common functions such as data collection, research and training. Indeed this situation has led to non-integration of water resources management. However, the relationship is very strong in terms of development of water projects where the States have depended on the Federal Government for funding, expertise and management at the State level, but clearly there is a need for improved communication and cross-sectoral co-operation.

(ii) **Recommendation**: To ensure future water security and to strengthen the co-operation in the development and management of water resources in the country, institutional Federal-State arrangement options have been proposed to sustain water resources in the country.

(iii) At the Federal level, there is not much choice in terms of overall structure. The structure that is being proposed is what is currently loosely accepted by various agencies although not formalised. The arrangement shown at **Figure 4.2** will require a mandate and streamlining of functions and inter-level and inter-agency interaction and/or cooperation.

(iv) At the State level, there are two institutional arrangement options that States can consider depending on the stage that they are in with regards to water resources management and development (see Categories of institutional arrangement in Table 4.4), extent of water resources availability vis-à-vis the demands, and the scale of their respective river basins.

(v) In each option, the aim is to ensure water security and to streamline the areas of co-operation between the Federal and State Governments in instituting water resource sector reforms more effectively to sustain water for various uses. The co-operation between the Federal and State Governments is thus vital.

(vi) For the Federal Territories an institutional arrangement is put forward for each that is considered the best option in each case, given the different legislative and institutional arrangements currently in place in the context of the pending national legislation and the new draft policy.

(vii) The final choice of which option will best fit the aspirations of a State is for the State Government to decide, but hopefully the choice will pave the way forward to eventually lead to some form of national uniformity in institutional arrangements in the country as advocated in the draft legislation and draft national water resource policy.

4.8.1 At Federal Level

(i) All the above reviews and consultations have led to the conclusions that there is a need for an over-arching entity for the water resources sector. There is unanimous agreement among the stakeholders that the NWRC is important and should remain as an over-arching apex entity, as it is a direct link to the Federal Cabinet because of the representation within the NWRC.

(ii) **Proposed Structure**: With the above in mind, the proposed Federal institutional arrangement set-up, called the National Water Resources (NWR) Model, will have three levels of administration and responsibilities (see **Figure 4.2**) following the draft NWR Law, namely:

(a) **The National Water Resources Council (NWRC)** shall be an apex body for water resources governance consisting of all the Heads of State Governments and relevant Ministries. It acts mainly in an advisory capacity (already in existence since 1998) and should set forth the general policy directions. The NWRC can also be the level at which any inter-state matters as required are directed for advice and recommendation for settlement. Currently, the NWRC has no legal mandate but is highly empowered in terms of the fact that the YAB Prime Minister/ YAB Deputy Prime Minister is the Chairman of the Council, with membership of the Council consisting of all Heads of State Governments and relevant Federal Ministers.

(b) **NWR Secretariat (NWRS):** This NWR Secretariat is presently co-shared between the MoNRE and KeTTHA. The recommendation is for the Secretariat to be housed in one Ministry only, where MoNRE has been proposed for such a purpose. Given that the MoNRE is the entity most attuned to and therefore able to guide sustainable resource management, such a recommendation is logical.

(c) **National Water Resources Department (NWRD):** The DID has been proposed by the stakeholders in the national Stakeholder Workshops to be the NWRD. Therefore this Study has devoted some attention on how this can be done through a detailed review of its functions, and benchmarking these functions against an ideal Water Resources Functional Model, where provisions can be made to fill in the functional gaps and/or re-align those existing functions as needed, to meet the requirements of a truly effective NWRD in future (see full details in **Annex 4.8**).

(d) Each of the levels of administration is now discussed in more detail.

4.8.1.1 National Water Resources Council (NWRC)

(i) **Current Situation**: The NWRC was first established on 29 June 1998 as a body to co-ordinate the development and management of water resources in the country. It was originally tasked to formulate a NWR Policy and facilitate harmonious and synergistic co-operation between Federal and State Governments. These responsibilities have not changed but new responsibilities were added as shown in **Table 4.1.**

(ii) The NWRC is currently not formalised by legislation but this situation is going to change when the proposed NWR Law comes into effect. The proposed NWR Law has made provisions to formalise the NWRC with membership, roles and functions clearly defined by law.

(iii) In terms of membership, the NWRC was chaired by the YAB Prime Minister until 2009 when it was transferred to the YAB Deputy Prime Minister. The other members in the Council include: the Minister of Finance; Minister of Natural Resources and Environment (MoNRE); Minister of Energy, Green Technology and Water (KeTTHA); Minister of Works; Minister of Agriculture and Agro-based Industry (MOA); Minister of Federal Territories and Urban Well-being; Minister of Housing and Local Government (KPKT); Minister of Plantation Industries and Commodities; Menteri Besars of Perlis, Kedah, Perak, Selangor, Negeri Sembilan, Johor, Pahang, Terengganu and Kelantan; and Chief Ministers of Pulau Pinang, Melaka, Sabah and Sarawak. The NWRC therefore offers a very direct communication link where water issues can be discussed and resolved between the Federal and the State Governments, and among and between States, because all the States are represented through their heads of States in the Council.

(iv) When fully mandated, the NWRC can be a very effective apex body for the water resources sector in the country because of the above representation in the Council. It can facilitate to strengthen water resources management capacity across the country, ensuring that the development of water resources is sustainable in terms of quantity and quality to meet the increasing demands by all water users and the environment in each State.

(v) **Future Scenario**: With the adoption of the institutional structure proposed in **Figure 4.2**, and based on the draft NWR Law, the role and responsibilities of the NWRC will be expanded (former NWRC roles seen in **Table 4.1**) to:

(a) Provide and coordinate national policies on IWRM/IRBM;

(b) Provide an avenue for consultation and coordination among various States and stakeholders;

(c) Have vested powers to consider, adopt and make recommendations on national *policies, plans and programs* (the three PPPs as defined in the draft NWR LAW);

(d) Provide directions to the MoNRE, the NWRD and other related bodies on matters pertaining to IWRM/IRBM;

(e) As an apex body, oversee the adoption of the NWR Policy, monitor its implementation and undertake periodic reviews of the Policy's effectiveness;

(f) Consider issues related to inter-state and trans-boundary IWRM matters, and in this vein, provide advice where mandated, and assist in policy decisions on issues pertaining to the management of inter-state and international trans-boundary catchments, water resources and aquifers;

(g) Advise the State and Federal Governments on the transfer and sale of water between States and to other regional and international countries; and

(h) Adopt a national program for research and development on water resources and empower the NWRD to implement these programs.

(vi) In relation to specific State matters, it can provide support when requested by the SWRC, when all other options are exhausted by the SWRC, in the form of an advisory and mediating body (acting as an arbitration entity) without the right to veto in matters of State rights.

(vii) The only major issue regarding the NWRC is that, it meets very infrequently, at the most two to three times a year, which is insufficient especially when there are urgent and pressing inter-state and national water security problems that need immediate consultation and discussion. If such matters persist, the Council may wish to review the frequency of meetings, or become open to entertaining shorter notice meetings as deemed necessary by key members of the Council.

4.8.1.2 National Water Resources Secretariat

(i) **Current Situation:** The current Secretariat to the NWRC was originally housed in the Ministry of Public Works until March 2004. After the Cabinet reshuffle in 2004, the MoNRE became the co-secretariat with KeTTHA to provide the ministerial level support to the NWRC, and to unify and strengthen integration of water resources development and management in the country.

(ii) **Recommendation:** Based on our review of the information gathered from extensive consultations in the study process, the Study is of the opinion that it will be more effective administrative-wise, if the NWR Secretariat is housed and administered by one Ministry. In this respect, since MoNRE is already empowered by the Cabinet to take charge of all natural resources including water resources in the country, it will be an appropriate Ministry to take charge of all matters related to water resources. In fact it is already carrying out this responsibility of implementing the decisions made at the NWRC

through the various administrative and technical agencies under the Ministry. If this recommendation is accepted, then MoNRE and KeTTHA will have to amend their Ministerial Act accordingly.

(iii) By taking up the Secretariat, the MoNRE can be in a better position to carry out the water reforms started after the NWRS (2000) period. The water services sector is already fully mandated and implemented by KeTTHA through SPAN and PAAB. The water resources sector however is still lacking in terms of uniformity of legislation, policies and responsibilities. The MoNRE can position itself to re-organise the water resources sector more effectively in line with the draft NWR Policy and draft NWR Law, if it is the custodian of the NWR Secretariat because of the full State representations in the NWRC, where water resource being a State matter, will require the concurrence of the State in the water reform process. This can be done at the NWRC through the Secretariat in MoNRE.

(iv) There is already a small division in MoNRE that is looking after all administrative matters arising from the decisions made at the NWRC. This division led by an Under Secretary in the MoNRE is the *Division of Water Resources, Drainage and Hydrology.* It is foreseen that this Unit will need further capacity strengthening once the NWRC is empowered by legislation, to provide a clearing house as well as to provide liaison activities and services with the States on all matters pertaining to water resources and inter-state water matters.

(v) The MoNRE is also at the forefront of all regional and international commitments with regards to water and the environment, and with the Secretariat in MoNRE, it will be much easier to gather information and manage all the committed international programs for the country, since it will have direct consultation with the States represented in the NWRC. For all these reasons, it is recommended that the NWR Secretariat be logically housed in the MoNRE. This too will also provide for more effective coordination and efficient management of limited resources with the planned NWRD, i.e. the DID, which is in the MoNRE.

4.8.1.3 National Water Resources Department (NWRD)

(i) **Current Situation**: Currently, there is no NWRD to carry out the functions of water resources management and development. Historically, various aspects of water resources management and development have been carried out separately by many departments. The previous NWRS (2000) report advocated the creation of a NWR Technical Agency to implement the functions of water resources management at the national level and to assist the State Governments in implementing their water resources projects at State level. With an expanding economy and rising affluence of the population, water resources within many rivers and other water bodies now suffer varying degrees of water pollution and water shortages. This has

resulted from past non-integrated management, i.e. a lack of effective IWRM implementation.

(ii) **Recommendation**: Our present Study shows that there is no necessity to create a new agency for such a purpose, but rather to review the current agencies that are carrying out water resource functions, and to re-align the functions of an appropriately qualified and experienced agency to be the NWRD. This aspect has been proposed and supported by the stakeholders themselves in the Consultative Workshops, with the reasoning that such a move will be less disruptive in terms of manpower deployment; the retaining talent, experience and expertise; it will be cost-saving; and provide for the retention of all current assets and infrastructure in the selected agency.

(iii) The stakeholders in fact recommended DID to be the candidate for the NWRD. This choice was predicated on the fact that DID is already largely performing many of the functions of water resources management at the National and at State levels. Thus, if DID is chosen as the appropriate entity, this outcome would satisfy all the reasoning stated above, as there will be no drastic devolution of any of the DID's administrative and operational work. Only re-alignment in some aspects of functions will be required along with the adoption of a few further functions to fulfil the WRF Model (**Annex 4.8**). Implementation of this recommendation would also not result in the encroachment of functions of other water-related agencies, which is one of the most important criteria to determine this choice. Rather, where certain data and information collection is the domain of another agency in relation to sectoral responsibilities i.e. climatic data, such data can be shared with the NWRD for the purpose of IWRM. Such synergies will result in increased efficiencies and multiple use of various data types for the greater benefit of the nation.

(iv) This preferred recommendation by the stakeholders however will have to be properly and concretely positioned with objective analysis. Therefore two further steps in the Study have been carried out before a final recommendation was made on the merits of the stakeholders' preference, i.e. the DID becoming the NWRD.

(v) **Step 1:** The first step was to compare the functions of DID with all major agencies that have direct and indirect water-related functions, where, if it was ranked very high against the Water Resources Functional (WRF) Model, then it would be seen as a logical candidate to be considered as the NWRD (see **Annex 4.8**, **Table A4.8.2**). Conversely, if the first step in the analysis were found otherwise, then another outcome to these recommendations would have to be made. Consequently, **Table A4.8.2 of Annex 4.8** demonstrates that upon a comparison of all major Federal-level Ministries and Departments, no single entity currently performs all of the main seven key function areas for water resources management.

(vi) The first step comparative analysis highlighted that of all the various departments compared, the DID accounted for the highest score, around 5.5 out of the 7 key function areas contained within the WRF Model towards achieving IWRM. Upon the initial identification of DID seeming to be the appropriate best fit agency to become the NWRD, a more in-depth analysis of functions of the DID was conducted in Step Two.

(vii) **Step 2:** In Step Two, the major key core functions of DID were reviewed and benchmarked against the set of key water resources functions (i.e. the WRF Model provided in **Annex 4.8, Table A4.8.3**) that a water resources agency must have, to be considered as a true water resources department. This WRF Model is based on best international standards and expectations for sustainable management of water resources in the context of IWRM.

(viii) The detailed analysis of the functions of DID against the functions in the WRF Model showed that with the list of current DID functions, the match is about 60% to the WRF Model, and if the proposed new functions identified by the DID previously were to be put into practice, then the match to the WRF Model would be in the range of 70-75%. This analysis thus provides some of the main answers to the pressing questions of:

(a) What further functions are needed for DID to be a complete NWRD;
(b) Which areas in the current functions would need re-alignment to the WRF Model; and
(c) How can the re-alignment be carried out effectively in the short, medium and long-term based on the NWR Policy and NWR Law.

The details of the analysis are provided at great length in **Annex 4.8.**

(ix) The draft NWR Law makes clear provisions for the establishment of the NWRD to address all the above issues pertaining to water resources at the national level in order to achieve IWRM. It proposes the NWRD be headed by a Director-General, vested with powers, duties and responsibilities on all matters related to the sustainable management, conservation and use of water resources in the country.

(x) The areas of responsibilities will be consistent with the three main areas of water; i.e. surface, groundwater and atmospheric water from source to the sea.

(xi) The draft NWR Law proposes that the NWRD absorbs and performs all of the current functions of the DID at the Federal level, and clearly defines further responsibilities in the areas of water resources and IWRM as follows:

(a) To formulate, assist, coordinate and to ensure the implementation of the NWRP as mandated by the NWRC and related national policies;

(b) Support the MoNRE in the formulation and implementation of the national policy on water resources;

(c) Assist the NWRC and MoNRE in determining national priorities for water allocation and use, for all sectors in normal as well as during times of drought (these matters can be supported by robust scientific data – a speciality of the current agency);

(d) Draw up the PPPs (policy, plans and programs) on water resources, monitor the various PPPs adopted by the stakeholders and perform auditing of the State of the nation's water resources including availability, sustainable use and conservation;

(e) Assist the MoNRE with the provision of expertise and opinions for national participation at international forums on water resources; and

(f) To support the implementation of IWRM/IRBM at all levels of governance, and to play a role of a regulatory and advisory body to enable it to recommend the technical details to enable IWRM in every State.

(xii) The NWRD will cover matters regarding the management and development of water resources which require Federal jurisdiction and will support the functions of other agencies (Federal and State levels) that are related to the process of sustaining water resources. It will not encroach into aspects related to the regulation and enforcement that are within the jurisdiction of any other agency.

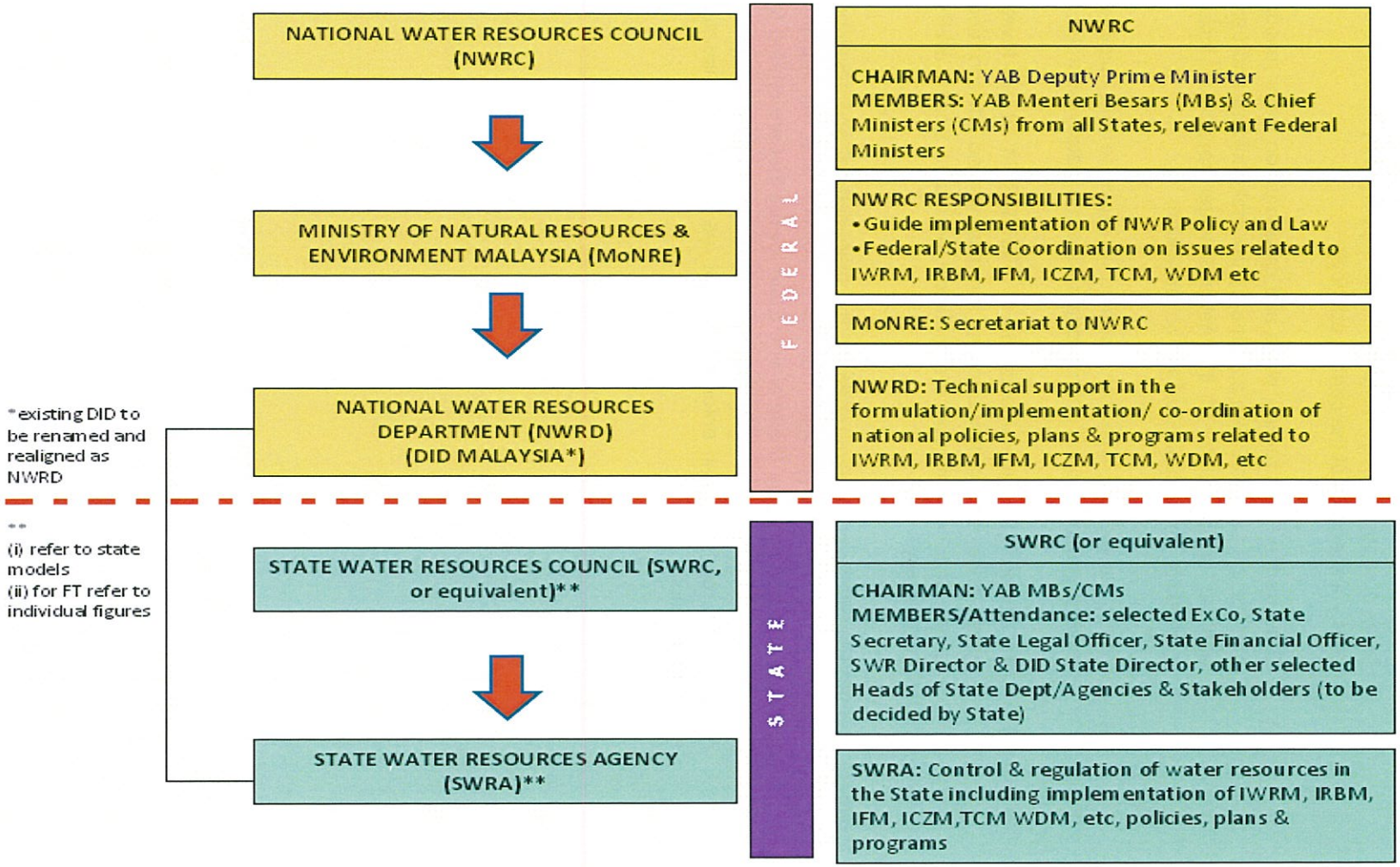


Figure 4.2 - Structure for an Institutional Arrangement at National Level (NWR Model)

4.8.1.4 State Level

(i) **Figure 4.2** provides a Federal structure that can be replicated at State level. Thus, at the State level, there can be a corresponding State Water Resources Council (SWRC) and under it, a technical State Water Resources Agency or Department (SWRA/SWRD) or equivalent. The recommendations and functions of the SWRC and SWRA or equivalent are stated along with explanations provided below and shown in **Figure 4.2**.

(ii) **Recommendation**: As shown in **Figure 4.2**, this Study has recommended that a corresponding SWRC be formed in the States, with advisory responsibilities in policies, plans and programs for the State, and any other State responsibilities as deem necessary. Correspondingly, it is recommended to have a SWRA to provide the administrative and technical functions to implement, control and regulate water resources in the State including implementation of IWRM/IRBM, policies, plans and programs.

(iii) **Current Situation**: Based the current institutional situation, only five States have an equivalent SWRC or apex body, but calling it by different names depending on their respective legislation (see **Annex 4.7**, which provides a summary of the institutional arrangements by States).

(iv) The five States having equivalent SWRC apex bodies are Kedah (Kedah Water Management Board); Selangor (Selangor Water Management Authority); Pahang (State Water Regulatory Body); Sabah (Sabah Water Resources Council) and Sarawak (Sarawak Water Resources Council). The rest of the States have water service agencies and structures, except Perlis, which is still under the line agency of the Water Supply Department, and the three Federal Territories.

(v) This current situation is unlikely to remain for long given the need for water reforms in the country. Already as seen in **Table 4.4** (categories of current institutional arrangements), States, which are in the service-oriented category (Category 3), will likely migrate to Category 2 and then to Category 1 when they carry out their water sector reforms to manage water in an integrated manner in the State. When this occurs, it will become crucial for States to form the apex body such as the SWRC or equivalent (names can be Council, Board or Authority) at State level, to provide policies on the management, development and allocation of water resources, while at the same time to provide the directions on sustaining the very water resources that will be abstracted for different uses in the State.

(vi) **Future Scenario**: The future scenario depends largely on the adoption of the draft NWR Policy and the NWR Law at State level (through similar policies and enactments), and making provisions by the State to establish an appropriate policy-making body such as the SWRC, to be chaired by the *Menteri Besar*/Chief Minister, to implement effective water resources

management policies in the State, including the national PPPs with the assistance and advice of the NWRC.

(vii) The State will have to empower the SWRC (along lines similar to empower the NWRC) through the State Water Resources Enactment. The five states mentioned above already have these enactments in place. The States that have inclinations to form the SWRC eventually will have to formulate a state water resources enactment for this purpose.

(viii) The responsibilities of the SWRC will include amongst others, advisory on all matters pertaining to IWRM/IRBM, policies on fair allocation of water resources to all users, and management of the Water Resources Fund to finance all policies, plans and programs at State level. It will also have advisory functions with regards to inter-state river basin matters.

4.8.1.5 State Water Resources Agency (SWRA)

(i) **Current Functions**: The SWRA is an agency under the SWRC or equivalent. It will be empowered by the State enactments to assist the SWRC in technical and administrative water resources matters.

(ii) States that do not have SWRA may wish to create a SWRA as a technical and implementing agency when the SWRC is formed. The SWRA has direct linkage with the NWRD and other water resources and water services agencies (see Models 1 and 2), and therefore national plans and programs are filtered down through the SWRAs to be implemented at the State level.

(iii) States that already have a SWRA or equivalent (see Model 2) are likely to adopt some or all of the functions mentioned below if they have not been functioning as such, as a water resources agency at State level. Where they cannot, the remaining functions at State level will have to be undertaken by another agency.

(iv) **Future Functions**: The draft NWR Law has identified a number of functions that the SWRA will need to undertake in line with the new legislation. No matter the nature of the SWRA (whether it is a line agency similar to the new NWRD [i.e. ex-DID] and therefore federally-funded or a completely State operated institution as in Sarawak), some of the core functions will include:

(a) Implement all State policies, plans and programs at the State level;
(b) Carry out State water resources assessment;
(c) State water resources allocation and regulation – to determine State level priorities for water allocations and use for all sectors as well as during times of drought;
(d) Carry out State water hazards management;
(e) Provide State water resources technical and scientific support;

(f) Assist and cooperate with the NWRD and undertake to implement the NWR Policy; and

(g) Collect, compile and publish critical data on water resources in the State for the country.

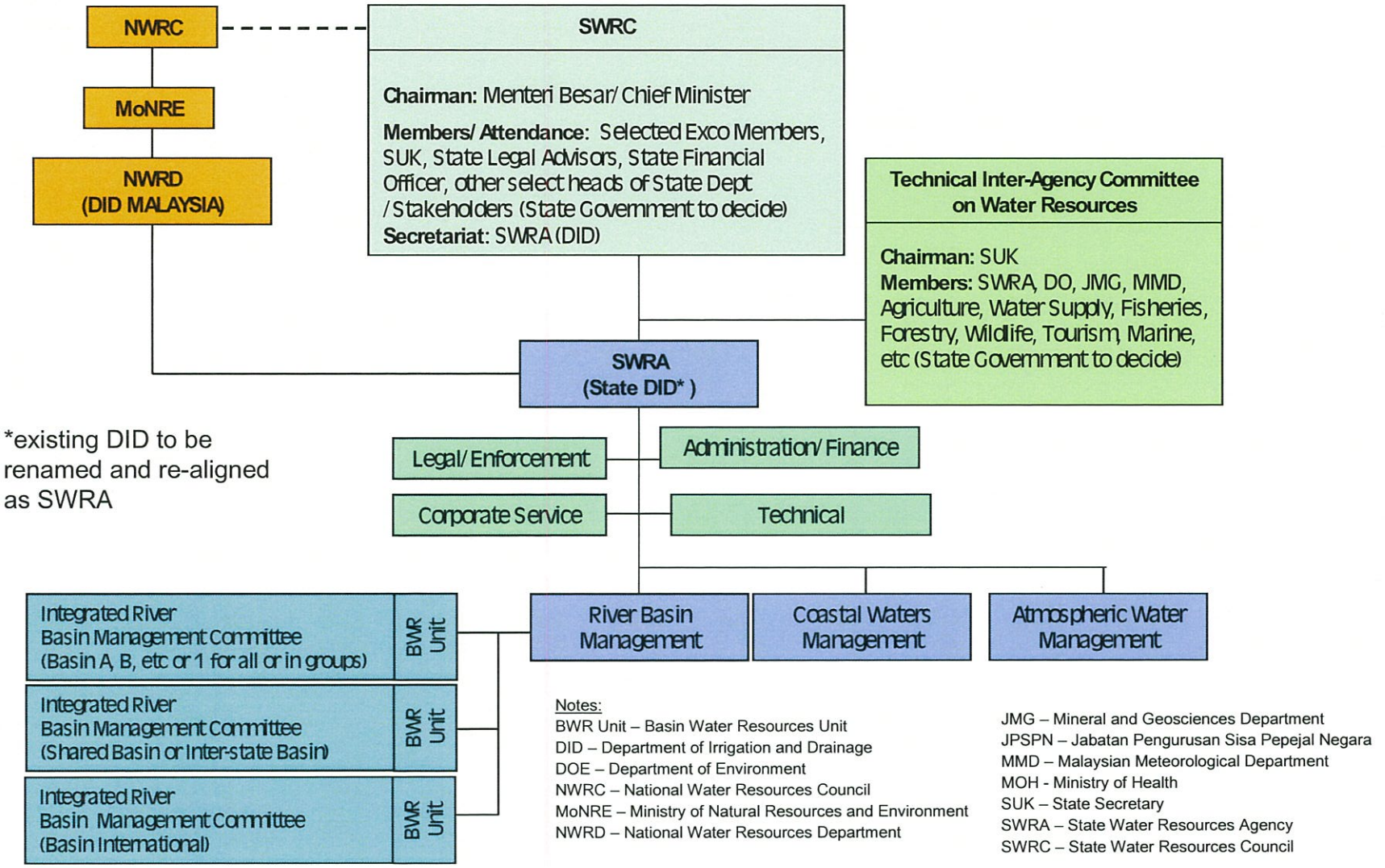


Figure 4.3 - Model 1 – Institutional Arrangements for States

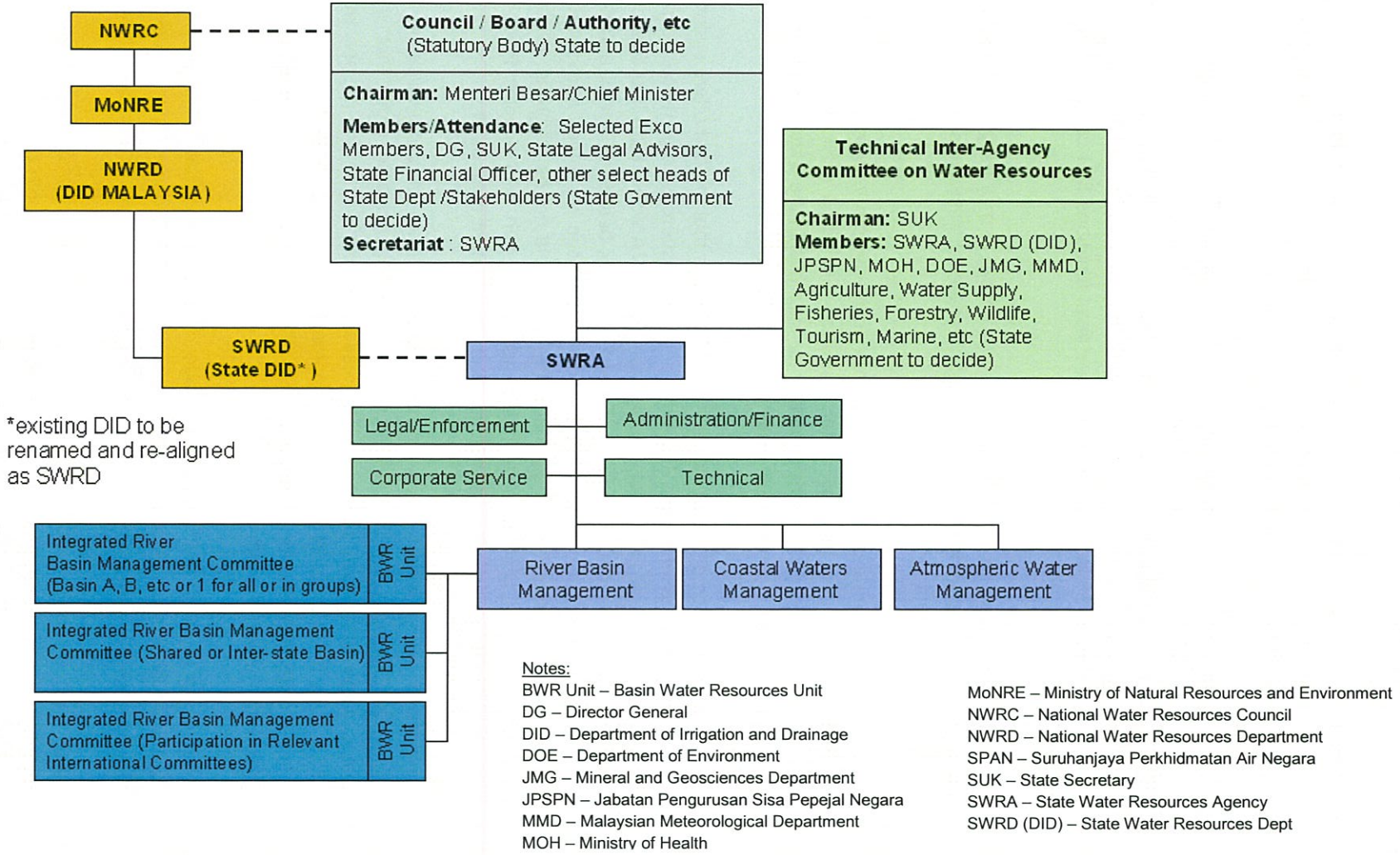


Figure 4.4 - Model 2 – Institutional Arrangements for States

4.8.2 Options for State Institutional Arrangements

(i) A nationwide review shows that there could be two institutional arrangement options for water resources management at the State level. The first is shown in **Figure 4.3** (Model 1) and the second is shown at **Figure 4.4** (Model 2).

(ii) The two Models will have a similar institutional line-up at the Federal level; that is, the NWRC, the SWR Secretariat and the NWRD. At State-level, each Model has a SWRC, a Technical Inter-agency Committee and a SWRA. The key difference is that in Model 2 an additional entity is shown i.e. a SWRD. This SWRD is there to perform federal functions at State level and any State level functions that cannot be met by the SWRA.

(iii) Model 1 is recommended for States that do not yet have or may have only started the development of an enactment and associated State-level institutions related to water resource management.

(iv) Model 1 is also recommended for States having many and very large river basins where the management of their water resources (including groundwater, surface water and atmospheric water) are important for intra (within the State) and inter (e.g. inter-state and international sale of water) usage of water.

(v) The primary difference between Model 1 and Model 2 is that the first offers a straight forward integrated option where the links between resources, e.g. human capital, finance, technology etc are direct, seeing that the SRWA would be a line-agency of the NWRD. In the second option (i.e. Model 2), the link between Federal and State would exist, although in terms of the connection between resources relevant to all aspects of water resources management, the links would not be as broad, because there would be two State-level technical agencies, each with specific focus not seeking to result in functions duplication, but to complement each other.

(vi) The second option Model 2 will also require a fair level of communication and cooperation between the two State-level technical agencies in order that water resources are sustainably managed. The lesser complex of the two options would provide for a more thoroughly integrated approach to water resources management. As in the case of Sabah for example, the SWRD and the SWRA could eventually be merged over a period of time.

(vii) It may come to pass, that with the passage of time, those States that may have chosen Model 2 may decide to move towards Model 1 based upon successful outcomes demonstrated over time by those States that have subscribed to Model 1.

(viii) Model 1 would be the preferred option in order to promote uniformity in water resources governance across the country. Another key strength of the first model is that it would also consolidate existing limited resources such as expertise and funds into a single technical agency to effectively manage what are now becoming scarce water resources in certain parts of the country. In Model 1 it is proposed that the

existing State DID will, as at present, continue to carry out Federal functions, and other functions related to water resource management as the State requires of them.

4.8.2.1 State-Level Entity: Composition, Purpose and Responsibility

(i) The direct line of communication to the Federal set-up is through the NWRC, NWR Secretariat and the NWRD.

(ii) At the State level, the apex body is the SWRC or equivalent, to be chaired by the Head of State Government, which is the *Menteri Besar*/Chief Minister. The SWRC provides the overall policy directions in terms of water resources management in the State.

(iii) The memberships of the SWRC consist of select EXCO members, SUK, State Legal Advisor, State Financial Officer, SWRA Director, and other select heads of departments and agencies. The number and which agencies to be represented will be decided by the State Government.

(iv) Under the SWRC, there is a *Technical Inter-Agency Committee on Water Resources* with the Chairman being the SUK. The members are the SWRA Director and Directors from the Departments of Agriculture, Potable Water Supply, Fisheries, Forestry, Wildlife, Tourism, Marine, etc. The number of members and the agencies to be represented in this Committee shall be decided by the State Government. It will have two main functions: (a) providing technical advice to the Council/Board/Authority and more importantly (b) providing various technical inter-disciplinary water resources inputs to SWRA. It will also provide a one-stop inter-agency forum to sort out overlapping functions in planning and program activities regarding development in river basins. The SWRC can also co-op prominent members of the private sector to give it better representation in the water resources sector.

(v) In Model 1, the administration of water resources is under the State Water Resources Agency (SWRA) or equivalent. As in the Federal Territories, it is likely that the State DID will be subsumed into a SWRA to implement all the water resources functions at the State level. It will have direct lines of communication with the NWRD, and it collaborates with the other relevant agencies regarding State water resources matters.

(vi) The SWRA is moulded along similar lines with the NWRD and will carry out Federal works at State level including the State operations. It will also have district offices. The SWRA is directly under the State Secretary at State level, but has direct lines of communication with the NWRD.

(vii) The SWRA is purely a technical, regulatory, administration and implementation agency, leaving the policy work to the SWRC, where the SWRA would provide technical input as requested. In terms of operations, the SWRA may be divided into various divisions. The two core divisions are the river basin management division and the coastal management division looking specifically at the coast and coastal waters,

to reflect its core functions. The other operational divisions are for the legal and enforcement services the administrative and finance services, the corporate services and other operational services.

(viii) The administrative structure of the SWRA is conceived to consist of an internal executive Board of Directors whose memberships consist of representatives from the divisions and units under the SWRA. More importantly, the directors of each of the river basins in the State sit in this internal Executive Board. Depending on the number of river basins in the State, the SWRA will have the corresponding number of directors in the SWRA.

(ix) This Board of Directors functions mainly in an in-house executive and operational capacity that internally co-ordinates to standardise SWRA procedures and operational activities across the State river basins. The Chairman of this internal executive Board is the Director of the SWRA, and is answerable to the SWRC (the SWRC provides policy directions only), and to a certain extent the *Technical Inter-Agency Committee on Water Resources,* but only on inter-agency matters.

- **River Basin Management Division**: In the SWRA, the river basin management division will coordinate all the Basin Water Resources Units (BWR Units), each headed by a Director. These BWR Units can also be called BWR Committees. The main function of these BWR Units is mainly to implement all activities regarding water resources in the river basin. The implementation of policies and enforcement also lies within the functions of the BWRUs.

- The river basin management division will also be in charge of all inter-state and international river basins that that State shares with the neighbouring States or countries, respectively.

- **Coastal Management Division**: This division deals mainly with all functions that have implications on water resources in the coastal areas with a coastal water limit of 3 nautical miles off the coast.

- **Atmospheric Division** is not likely to be a main division, although in periods of dry spells and droughts, there may be a need to have cloud seeding, in which case, the division will have to co-operate very closely with the MMS on matters relating to atmospheric water.

(x) Based on the above concept, structure and operational approaches, Model 1 is a decentralization model where the real strength lies at the river basin level with the BWRUs, and not so much in the SWRA, which acts only to implement the policies of the SWRC, with the internal Executive Board as the co-ordinating body for all the BWRUs.

- Each river basin is different in terms of physiography, ecology, quantity and quality of water, cultural and socio-economic landscapes, including levels of

urbanization and industrialization. There are therefore strong reasons to manage each river basin individually based on the broad approach and steps for IWRM and IRBM.

- Model 1 provides a separation of functions between the SWRA and the BWRU, which is neat and logical because as indicated above, each river basin is different and therefore there is every reason to manage each river basin individually. It also complies with the draft NWR Law.

- Each river basin can be a river basin authority (only for very large river basins). If there is a move towards this end, the river basin authority can be a statutory body. The SWRA will then function mainly as a regulator rather than an implementer. In either case, the SWRC will still be there to give policy directions and aligned to the NWRC at the Federal level.

- The main weakness in this Model 1 lies in the areas of skilled manpower to manage the SWRA and the BWRUs. This shortage of manpower is seen at all levels of work, where there is a need for river basin managers, technologists and multi-disciplinary scientists, technicians etc to work in these river basin agencies.

- At the BWRU level, the problem is in terms of management of all aspects of water resources in the river basin that include surface, groundwater and coastal waters. Invariably, the management will encroach into the sensitivities of other agencies that have full jurisdiction of other resources in the river basin such as forests, water quality, land and minerals, abstraction of water by the water service sector etc. Any actions by the BWRU will have a reaction on the other agencies. Therefore, there is a need for Terms of Agreements (ToA) with all the other sectors and agencies at the river basin level before forming and implementing the BWRUs by SWRA to manage water resources in the river basins. Unless this is done conflicts will arise in terms of possibly overlapping of functions, and areas of jurisdiction. This is the reason for having an internal executive board in SWRA to oversee and offset such internal problems, and the *Technical Inter-Agency Committee on Water Resources,* to oversee to all external areas of potential conflicts among agencies.

(xi) Model 2 has more flexibility in the development and management of the water resources. The organisational structure can be amended according to the needs of the State, especially if the State already has a State enactment for water resources management and an existing entity looking after water resources.

(xii) A key potential drawback of Model 2, is that it will not create or cause to be seen a fully integrated approach to water resources management, and therefore should in the context of aiming towards IWRM be considered as a temporary arrangement where a significant emphasis on integration and communications will be necessary between the two State-level technical entities.

4.8.3 The Federal Territories

(i) **Current Situation**: Currently, in the three Federal Territories (FTs), there are departments that function as line agencies in terms of water management.

(ii) The Study has taken cognizance of the differences in water administration in each FT, and their aspirations in terms of water quantity and quality. In the case of Putrajaya, which manages its water so carefully, it still faces water shortages from time to time. In the case of Kuala Lumpur and Labuan, the problem is with regards to quantity and quality of water. Labuan is now getting water from Sabah, while Kuala Lumpur is having problems of getting sufficient water for its population. All these problems require an agency for water resources management, however small or truncated the rivers are in their respective basins.

(iii) **Recommendations**: The institutional arrangement recommendations for the FTs (i.e. Putrajaya, Kuala Lumpur and Labuan) are shown in **Figure 4.5**, **4.6**, and **4.7** respectively. Each is unique although sharing most of the common arrangements as provided for in their institutional arrangements. For uniformity in administration and in line with the draft NWR Policy and NWR Law, each FT is provided with a specific recommended institutional arrangement and structure, where the aim is to implement IWRM without displacing any specific departments or entities, whilst making the most of current institutional strengths such as human resources, technical capacity and budget.

(iv) The key difference amongst the three FTs is that, only Labuan has a coastline to be managed in terms of coastal water resources. The other two FTs do not have a coastline to manage. Consequently, the recommended institutional structure for Labuan also contains a coastal division under the recommended Federal Territory Water Resource Agency (FTWRA).

(v) As shown in each of the figures pertaining to the FTs, an agency called the FTWRD has been recommended. The recommended institutional arrangement will for each FT to include two primary levels of administration, i.e. the FTWRC and the FTWRA. The first level is the main line of contact at national level, when it is aligned to the NWRC, the NWR Secretariat and the NWRD, where the functions are already indicated in the above preceding sections. At the second level, being Federal institutions, but with more autonomy in terms of administration, the FTs will also have its own line agencies where responsibilities are aligned to the FTs functions.

(vi) In terms of communication, the Federal Territory Water Resource Council (FTWRC) will play an advisory role in terms of policy on water resources management. The Minister (proposed to be the Minister of the Federal Territory and Urban Wellbeing) is the Chairman of the FTWRC. The proposed memberships of the FTWRC will include the Mayor/President, Legal Advisor, Financial Officer, FTWR (DID) Director, relevant and selected heads of department or units and stakeholders (Minister to decide). As there is already a NWRC, the FTWRC may or may not be necessary as their interests are already represented in the NWRC.

(vii) There is a *Technical Inter-Agency Sub-Committee on Water Resources* that will provide the technical support. The members in the *Technical Inter-Agency Sub-Committee* will come from various relevant technical agencies such as Directors from DID, Agriculture, Potable Water Supply, Fisheries, Forestry, Wildlife, Tourism, Marine etc. The Chairman, the number of members, and agencies to be represented in the *Technical* Inter-*Agency Sub-Committee,* will be nominated by the Minister.

(viii) The Model also recommends the establishment of the FT Water Resources Agency or Department or equivalent (FTWRA/FTWRD) by subsuming the FT DID into the FTWRA/FTWRD. This has the advantage of less significant institutional re-arrangement being needed by using the current water resources functions of FT DID, where only an expansion of the roles and functions is anticipated in line with the WRF Model requirements.

(ix) The FTWRA will also have all the assets and infrastructure already in place, and there will be minimal disruption to the current administration, and less manpower re-deployment. However, capacity building and training will be required in view of the additional and new scope of work in the FTWRA.

(x) The FTWRA will have technical, regulatory, administrative and legal divisions as shown in each of **Figure 4.5 – 4.7**.

(xi) The FTWRA, similar to the NWRD or the SWRA, will be managing water resources using the river basin approach, even though the rivers are generally very small, and some of the rivers are truncated where segments of the rivers are in other areas or States not under its jurisdiction. In this respect, inter-state and trans-boundary matters related to rivers and water resources will be an important core function of the FTWRA in the FTs of Kuala Lumpur and Putrajaya. This does not apply to Labuan, which is an island where the 24 small rivers are all within Labuan jurisdiction.

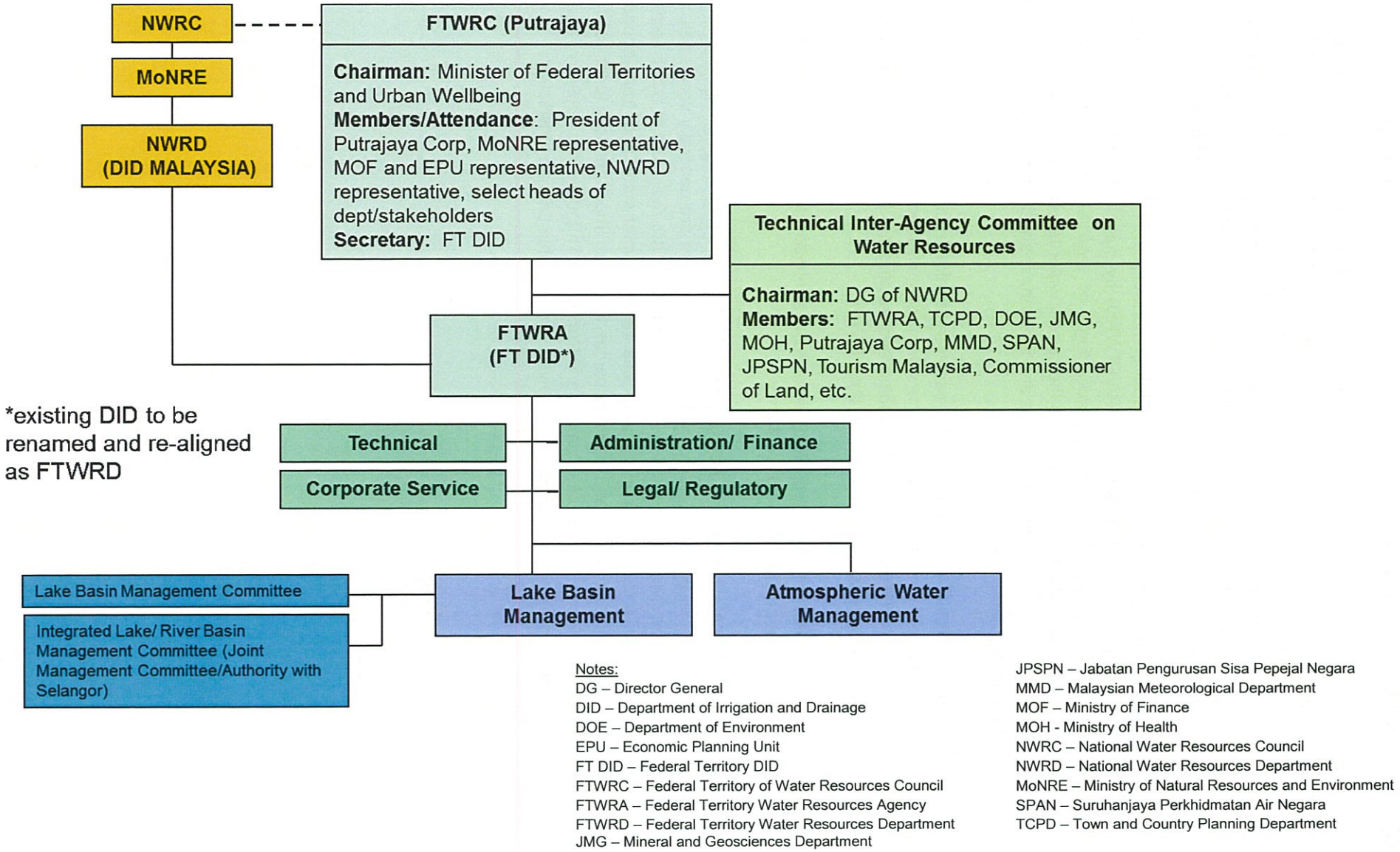


Figure 4.5 - Institutional Arrangements for the Federal Territory of Putrajaya

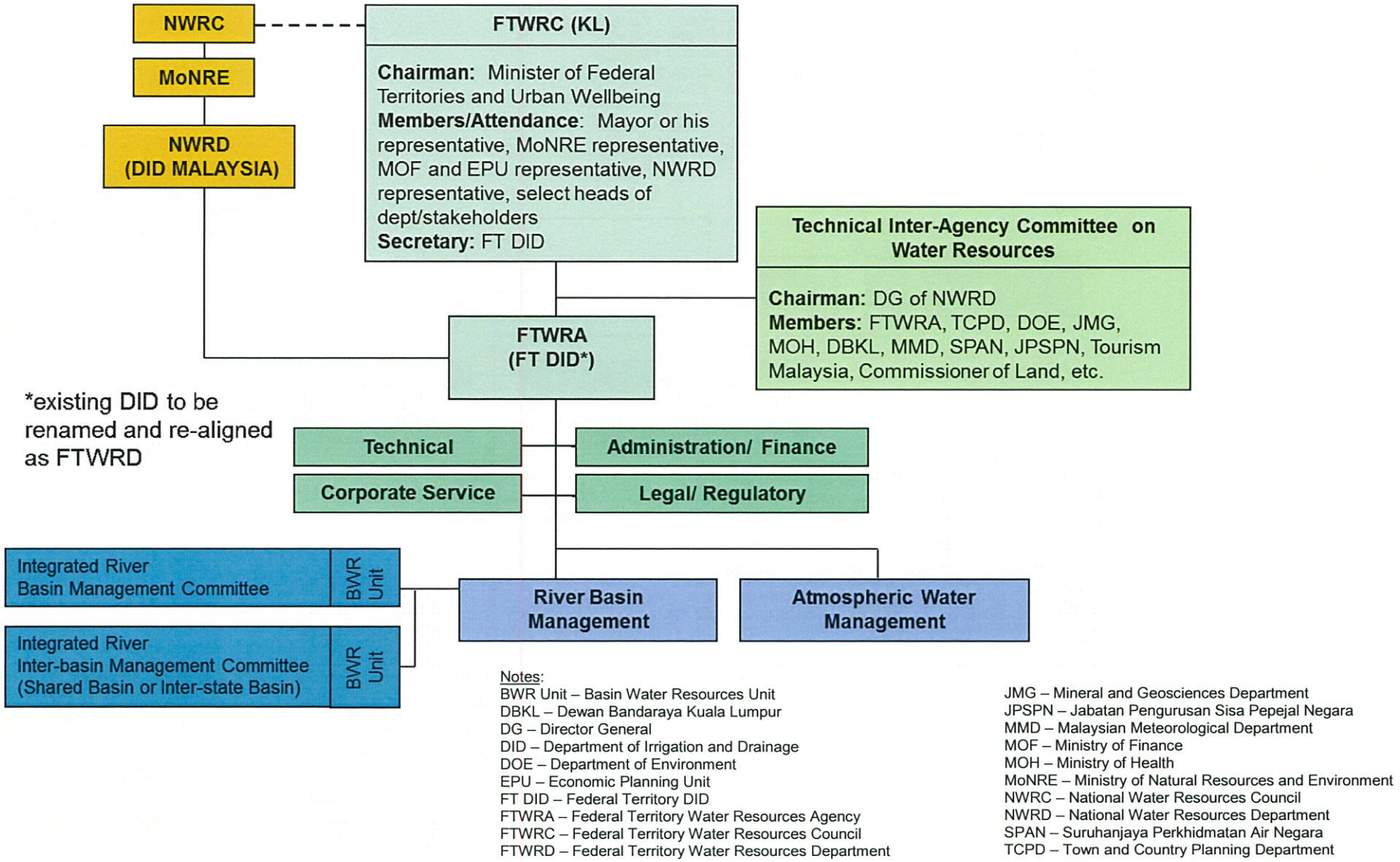
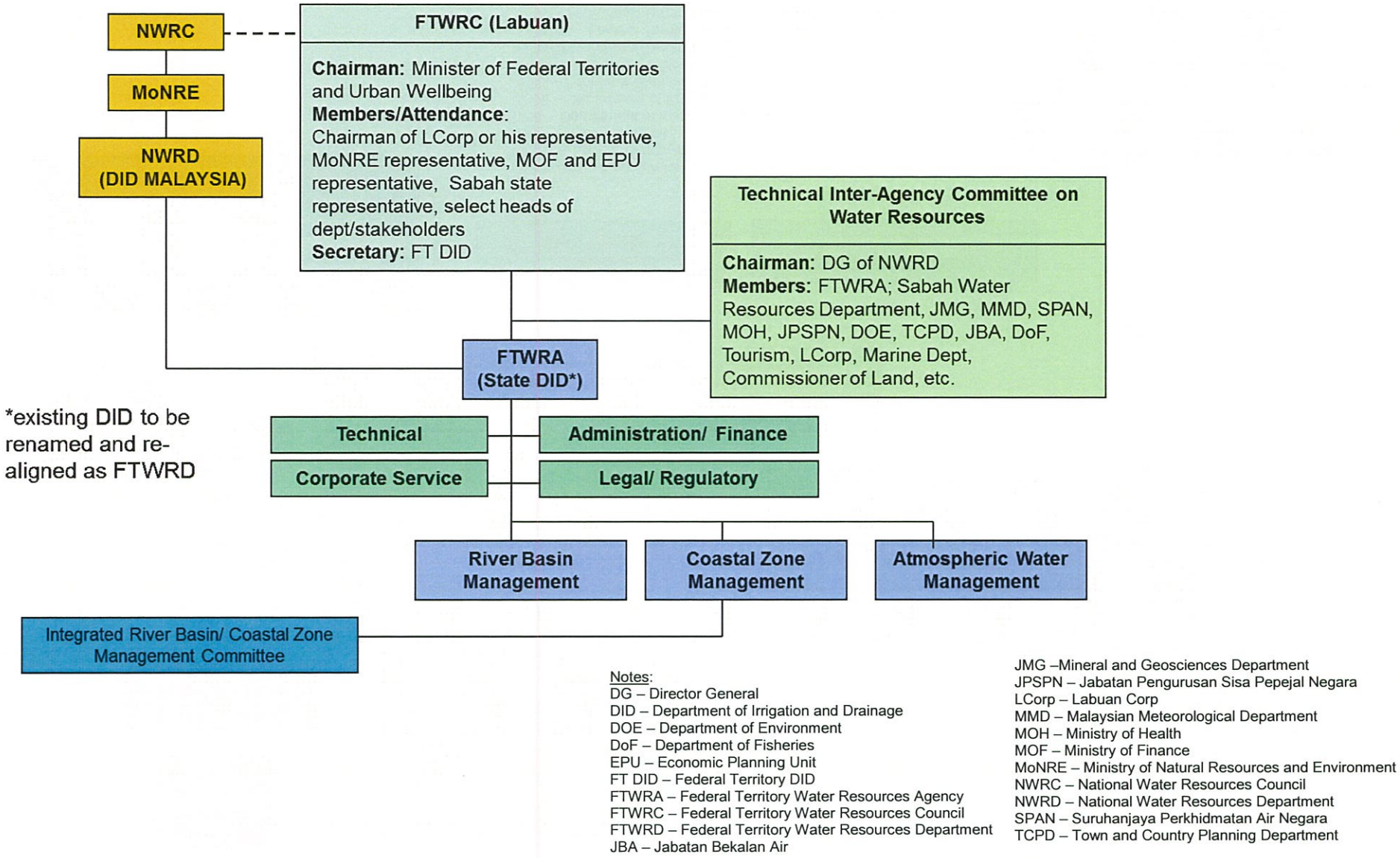


Figure 4.6 - Institutional Arrangements for the Federal Territory of Kuala Lumpur



Notes:
DG – Director General
DID – Department of Irrigation and Drainage
DOE – Department of Environment
DoF – Department of Fisheries
EPU – Economic Planning Unit
FT DID – Federal Territory DID
FTWRA – Federal Territory Water Resources Agency
FTWRC – Federal Territory Water Resources Council
FTWRD – Federal Territory Water Resources Department
JBA – Jabatan Bekalan Air
JMG –Mineral and Geosciences Department
JPSPN – Jabatan Pengurusan Sisa Pepejal Negara
LCorp – Labuan Corp
MMD – Malaysian Meteorological Department
MOH – Ministry of Health
MOF – Ministry of Finance
MoNRE – Ministry of Natural Resources and Environment
NWRC – National Water Resources Council
NWRD – National Water Resources Department
SPAN – Suruhanjaya Perkhidmatan Air Negara
TCPD – Town and Country Planning Department

Figure 4.7 - Institutional Arrangements for the Federal Territory of Labuan

4.8.4 Summary of the Recommendations

(i) **Situation**: Based on the national and two State models (Models 1 and 2) and individual models for each of the three FTs, it is clear that there are strengths and weaknesses in each.

(ii) **At the national level**, the models:

(a) Recognise the NWRC as the national apex body to provide the overall direction, policies and guidelines on water resources management.

(b) Recognise that some form of uniformity in policies and protocols for implementation is needed.

(c) Recognise the need to communicate the water resource policies and guidelines down to the State levels through the NWRC.

(d) The respective FTs have been provided with individual models mainly because of their unique positions as well as locations. In the case of FT Kuala Lumpur, the river basin is truncated with the upper and lower parts of the Klang Basin in the State of Selangor, whereas FT Putrajaya is 70% embedded in the Sg Chuau Basin, a tributary basin of the Sg Langat Basin, also in the State of Selangor. The exception is the FT Labuan, which is an island with very small river basins, but nevertheless important as water source areas. All the FTs will need an agency each to look after their limited water resources and to manage water pollution, and in the case of Labuan the coastal areas as well. The models proposed for each of the FTs basically follow the Federal line of representation. There is a Technical Committee to assist in inter-agency water-related matters because the FTWRA is likely to be small, and would need specialised skills to manage their limited water resources.

(iii) **At the State level**, the models:

(a) Recognise that there is a need for a corresponding State apex body, but the concept, structure and operations/ responsibilities are likely to differ. Even the name of the State apex body could be different, such as the SWRC, which can be called a Board, Council, Authority etc, and their responsibilities will differ slightly depending on the aspirations of the States.

(b) In **Figure 4.2** outlining the national overview, the line of communication between the State and the Federal NWRC is very direct with the basic objective of creating uniformity of policies, legislations and procedures in water resources management in the country. Conceptually, the structure and operations are also straightforward as they are all aligned between the Federal and State levels. In practice, it will require the full cooperation of all

stakeholders and water-related agencies at State level, when a State wants to align itself to the national aspiration.

(c) Model 1 reflects all the features of a decentralised river basin agency approach with centralised guidance. It has an apex body, where the *Menteri Besar*/Chief Minister is the Chairman. At the lowest level, each BWR Unit is an administrative area.

(d) Model 2 is provided as an option for States that have already progressed some way down the path of water resources management having set up entities to manage water and having in place enactments for water resource management. It is essentially seen as a transitional model that may eventually migrate to the structure as given in Model 1. Model 2 need not be adopted by States if they conceive the other option, i.e. Model 1 as being more appropriate to meet their needs.

(iii) **Recommendation**

Based on the above and through the extensive consultative process, the following summarises the recommendations for consideration.

(a) **Figure 4.2** is the National Water Resources Model for the national level and is more or less accepted by the stakeholders, including the NWRC and NWRD. It is recommended that this framework be accepted and encapsulated within the national NWR Law.

(b) The position of NWR Secretariat is slightly tenuous. Currently, it is shared between two Ministries (MoNRE and KeTTHA). It is recommended that the NWR Secretariat be housed in one Ministry, where MoNRE has been proposed to house the NWR Secretariat by the majority of the stakeholders.

(c) The need for a NWRD is also accepted by the stakeholders. The option is in terms of a name change to reflect the functions. At the State level, it can be called an agency, authority, department, etc. The choice in name is left open at State level.

(d) The choice of DID as proposed by the stakeholders to be the NWRD is because it is already performing many of the water resources functions as seen in the benchmarking exercise against the functions of all other water-related agencies in the country, and against the ideal functions provided in the WRF Model. This option can be decided quite easily as the functions and scope of work in DID have a good match to the ideal WRF model, compared to the other water-related agencies in the country (see **Annexes 4.8**). If another agency were to be selected, this would require a far greater input of resources including a much greater budget, not to mention the need for a great deal more development of human resources to meet the objectives of IWRM. Additionally, it could lead to functional duplication and non-integrated management causing further declines in water resources management.

(e) If DID is accepted as a the logical choice to become the NWRD, then such matters will be much less evident, as the Department already contains a significant level of required human capital and expertise, and physical and infrastructural assets, thus allowing for a smoother transition towards a truly capable water resource agency.

(iv) **Timeframe**

(a) It is anticipated that within a short-term timeframe of three years, all the States maybe able to form SWRCs corresponding to the functions of the NWRC at the Federal level. This is important to ensure there is a direct line of communication between Federal and State levels among other advantages. The five states that have SWRCs, such as **Selangor, Kedah, Pahang, Sabah and Sarawak**, already have some form of SWRCs and they can, with slight refinement move towards Model 1, although they may choose Model 2 at first with the intent of transitioning towards the most efficient model, i.e. Model 1.

(b) In the medium term, lasting five years, the States may have already bought-in having adopted the Federal water resources policies and legislation, and therefore may want to effect changes to their organisational structures to better manage their water resources. In such a case, they can move directly to Model 1 depending on their aspirations and requirements.

(c) In the long-term to a maximum of 10 years, all the major river basins may have a River Basin Agency (RBA), which can also be called River Basin Authority or equivalent, with the smaller river basins still under the BWR Units that collectively will be under the RBA of that particularly river system.

(d) By the tenth year, it is hoped that a final uniform structure for institutional arrangement for integrated water resources management (i.e. Model 1) may emerge using the tools and concepts of IWRM and IRBM in the country, without major devolution of any of the current agencies, but mainly to streamline the functions and responsibilities of the existing agencies.

4.8.5 Capacity Building Requirements

(i) Underpinning the whole water sector reform is capacity building. It is an important aspect that is often written in the documents but seldom given practical attention. All the recommendations above have to be underpinned by a national and State-level strong and relevant capacity building exercise in order to make the transformation process identified in this Study come to fruition. It is therefore singled out as a specific and immediate recommendation.

(ii) Capacity building will be required at both the Federal and State levels (including within the Federal Territories); however, of immediate priority will be the capacity

building required at Federal level, where the transformation process is being carried out first, especially in re-aligning the DID to be the NWRD. Therefore, the following overview focuses primarily on the new NWRD in terms of capacity augmentation. Through achieving such capacity enhancement, a filtering down of new capacity will occur at the State and Federal Territories levels, which for all intent and purpose should place Malaysia at the forefront of IWRM regionally, if not internationally.

(iii) Of immediate substance in the context of capacity building for the new NWRD, is that the purpose and approach suggested here seek not to displace human resources, but to enhance that which already exists, i.e. the approach seeks to build upon the strong basis already in place. Therefore, not only does this discussion focus on the new NWRD, it also suggests a three-pronged plan (**Figure 4.8**) to enhance capacity, i.e. (1) through learning-by-doing, (2) through informal and formal additional training of existing human resources, and (3) through direct recruitment of specific human resource disciplines mainly within the non-engineering sphere. An additional option, not covered in detail here (as it is seen as a long term approach), is to send select staff for further higher degree qualifications. This will take time to achieve (i.e. many years to attain a necessary critical mass if taken as the only approach) given limitations in current IWRM-related tertiary qualifications locally or the higher costs internationally.

(iv) **Capacity Building for Re-alignment of DID:** The re-alignment of DID to be the NWRD will not be very difficult because DID already undertakes many of the obvious functions of a NWRD at present. No other existing department possesses this advantage at present in terms of water resources management functions. At first, the department will only require some refinement to the job scope and divisions of works in the main. However, there will also be a need for a broader set of skill-sets to be brought into the department, more multi-disciplinary in nature so as to cater to all the various disciplines of research and water resource management knowledge required for an approach embedded within IWRM and IRBM.

(v) The more important aspect of the re-alignment exercise is the availability of human capacity to perform the functions and job scope. As many aspects of water resources management will require engineering, non-engineering, the social sciences and scientific skills and expertise, a lot more people will have to be recruited into the NWRD over the medium to long term. The engineering component is not an issue here, but the non-engineering component is one aspect that DID does not yet have strong emphasis at present, although some good progress has been made towards this (e.g. a high level of expertise in hydrology, data management and collection).

(vi) Thus the immediate action is to fill in the identified non-engineering and scientific positions with the appropriate personnel having the necessary skills and expertise. Prior to this, skill areas required will need to be assessed for whether they can be addressed in the short term through formal and informal training, or whether specific skill sets need to be addressed more over the medium to long terms. As capacity building will take time, this aspect has to begin immediately. The process will require a strategic staging plan that is objective orientated and audited for progress while

being regularly benchmarked against short, medium and long term capacity needs/goals/objectives. The three-pronged capacity enhancement approach will if implemented provide fast-tracking in tandem with long term needs fulfilment required to fill some capacity gaps over an incremental timeframe.

(vii) Therefore, DID will have to devise a plan of action after this Study, to build up the capacity for work under the new re-aligned department. This will be determined also by the extent to which any re-alignment has already occurred. The department will need a plan of action based upon real on-the-ground aspects. As shown in **Figure 4.8**, one option as a part of the approach to capacity building can be done by direct recruitment or by secondment of staff from other departments, the latter being unlikely to be the best option. Direct recruitment will result in fresh and trainable human resources, whereas secondment may not provide the best fit. A combination of each could be part of the program, where secondment is seen as a temporary measure carefully conducted until knowledge in specific fields increases internally. The department will need to build a critical mass of knowledge in all necessary disciplines.

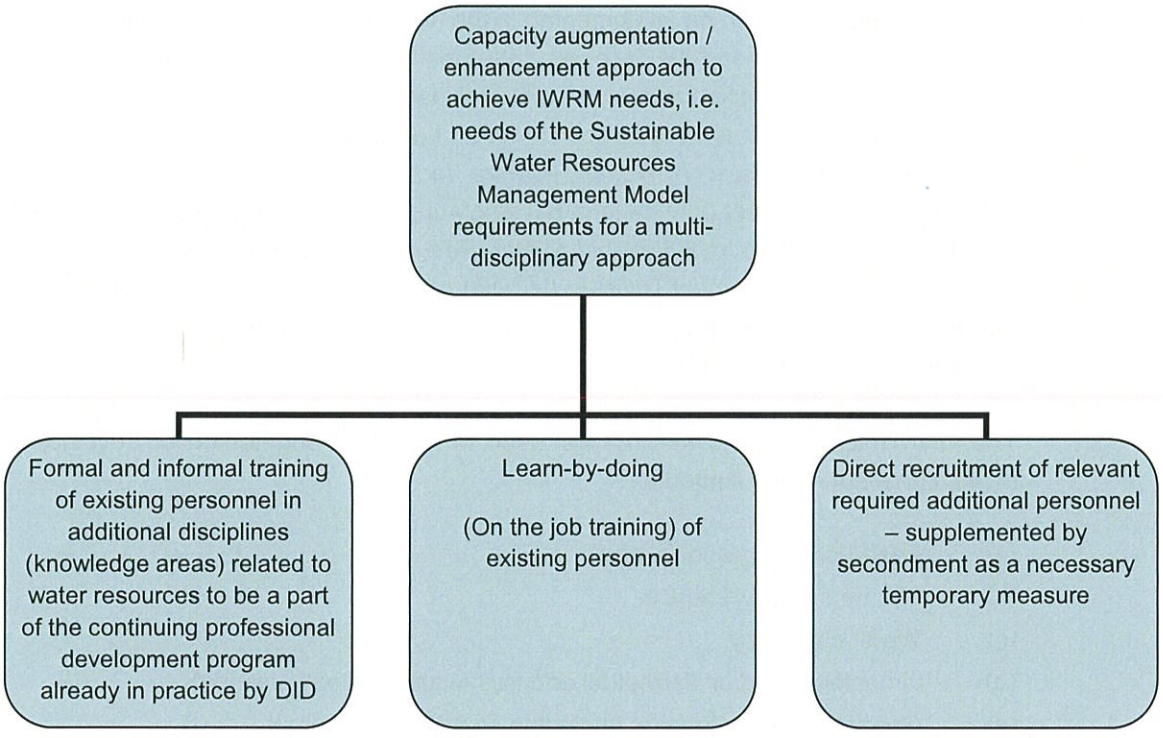


Figure 4.8 - 3-Pronged Strategic Capacity Enhancement for Model Functions Requirements

(viii) Some of the present engineering staff can also be progressively retrained to perform some of the new non-engineering job scope under the new re-aligned department, essentially being trained through the learn-by-doing approach. This is unlikely to pose a problem as nearly all the engineering staff, are trained in engineering skills and thus would be able to bolster their knowledge areas if so desired. Additionally, some personnel may also wish to participate in informal structured training and on

the job training to begin to expand their individual job-scopes. These efforts made by existing personnel should be recognized and rewarded accordingly as part of a performance enhancement rewards system. Although being an important element in capacity building this will however, only provide a temporary interim solution to realise the true extent of the expansion of roles and functions required to become a NWRD in the broad contextual requirements of IWRM couched and communicated within the WRF Model.

(ix) If it is considered desirable, the *learn-by-doing* approach as part of an overall strategy, has equal merit in the advancement of institutional capacity building as a short, medium and long-term solution. This option will need to be developed as a complementary activity alongside any informal and formal training schedule. Through the UK experience, while implementing IWRM, various agencies found that there was very real benefit and merit in promoting an iterative *learn-by-doing* approach to capacity enhancement. What eventuated from this is called the *watercourse approach*. Essential in understanding this approach; 'the water course approach sees IWRM not as a management strategy, but as a set of principles and practices which facilitate learning and adaptive approaches'.

(x) One mechanism that can be implemented in the near-term is that The Humid Tropical Centre can be upgraded to take on the functions to provide training to non-engineering and scientific staff on an informal basis to augment the expanded job scope in the NWRD. It too may need a name change; possibly it might be called a *Water Resources Research Training Centre for the Humid Tropics* to reflect its enlarged functions of not only training but also supporting research in the NWRD. An alternative is to utilize the *National Water Resources Institute* directly under the Human Capital Development Division (HCDD) as the centre for training, or to work out training arrangements between the two, i.e. The Humid Tropics Centre and the National Water Resources Institute.

(xi) The key additional disciplines that will need to be either augmented or developed, may include but not be limited to:

(a) IWRM planning and theory;
(b) Marine ecology/science;
(c) Water chemistry;
(d) Limnology (and or Terrestrial and freshwater ecology/science);
(e) Geography and planning (including coastal geography);
(f) Public environmental policy development;
(g) Communications (e.g. Environmental public education, awareness and information management);
(h) Environmental technology;
(i) Law;
(j) Finance;
(k) Geology and groundwater science;
(l) Hydrography and oceanography;

(m) Environmental engineering;
(n) Sociology and cultural geography (and/or anthropology);
(o) Freshwater navigation, technology and planning;
(p) Economics & environmental economics;
(q) Hazards risk assessment and modeling; and
(r) Advocacy and negotiation, etc.

(xii) As can be seen from the above list, IWRM requires a truly broad set of knowledge areas. Achieving such a knowledge-base, will take time and will need to occur over the medium and long-term timeframe. In the interim, a full and comprehensive assessment study of human capacity in all necessary disciplines will be required, once the implications of the requirements for successful IWRM have been fully comprehended throughout this Study. This will require a thorough review at the divisional and sub-divisional levels, including within all units etc of the current functions and strengths to identify what and how much is required in terms of HR capacity to meet any gaps necessary to achieve comprehensive IWRM; i.e. to meet all aspects of the functional matters outlined in the WRF Model.

Annex 4.1 – Institutional Arrangements in ASEAN Countries

ANNEX 4.1 - INSTITUTIONAL ARRANGEMENTS IN ASEAN COUNTRIES

Country	Ministry	Acronym	Department/ Statutory Body	Acronym
Brunei Darussalam	**Ministry of Development**	**MOD**	**Department of Water Services**	**DWS**
			Public Work Department	JKR
			Department of Environment, Park and Recreation	
	Ministry of Health	MOH	Department of Health Services	
	Ministry of Industry and Primary Resources	MIPR	Department of Agriculture and Agrifood	
			Forestry Department	
Cambodia	**Ministry of Water Resources and Meteorology**	**MOWRAM**	**Department of Water Resources Management and Conservation**	
			Department of Hydrology and River Works	
			Department of Irrigated Agriculture	
			Department of Engineering	
			Department of Water Supply	
			Department of Meteorology	
			Department of Farmers Water User Community	
	Ministry of Industry, Mines and Energy	MIME	Department of Potable Water Supply	DPWS
	Ministry of Rural Development	MRD	Department of Rural Water Supply	DRWS
	Ministry of Environment	MOE	Department of Nature Conservation and Protection	
			Department of Pollution Control	
Indonesia			**National Water Resources Council**	NWRC
			National Planning Development Board	BAPPENAS
	Ministry of Agriculture		Directorate General of Land and Water Management	
	State Ministry of Environment			
	Ministry of Public Works	**PU**	**Directorate General of Water Resources**	
	Ministry of Forestry	MOF		
	Ministry of Home Affairs and Regional Autonomy			
Lao People's Democratic Republic	Prime Minister's Office		**Water Resources Coordination Committee**	**WRCC**

Country	Ministry	Acronym	Department/ Statutory Body	Acronym
Malaysia	Ministry of Natural Resources and Environment	NRE	Department of Irrigation and Drainage	JPS
			Mineral and Geoscience Department	JMG
			Forestry Department of Peninsular Malaysia	JPSM
			Department of the Director General of Lands and Mines	JKPTG
			National Hydraulic Research Institute of Malaysia	NAHRIM
	Ministry of Health	MOH	Engineering Services Division	
	Ministry of Energy, Green Technology and Water	KeTTHA	National Water Services Commission	SPAN
			Water Supply Department	JBA
			Sewerage Services Department	JPP
	Ministry of Agriculture and Agro-Based Industry	MOA	Department of Agriculture	DOA
			Department of Fisheries	DOF
			Muda Agriculture Development Authority	MADA
			Kemubu Agriculture Development Authority	KADA
	Ministry of Public Works	KKR	Public Works Department	JKR
	Ministry of Housing and Local Government	KPKT	Town and Country Planning Department	JPBD
			Local Government Department	JKT
	Ministry of Rural and Regional Development	KKLW		
	Department of Director General of Lands and Mines	JKPTG	Department of Land and Mines	PTG
	Prime Minister's Department	JPM	Economic Planning Unit	EPU
			National Water Resource Council	NWRC
Myanmar	Ministry of Agriculture and Irrigation	MOAI	Irrigation Department	
			Water Resources Utilization Department	
	Ministry of Progress of Border Areas and National Races and Development Affairs	PBANDRA	Department of Development Affairs	
	Ministry of Transport	MOT	**Directorate of Water Resources and Improvement of River Systems**	DWIR

Country	Ministry	Acronym	Department/ Statutory Body	Acronym
			Department of Meteorology and Hydrology	DMH
	Ministry of Electric Power	MOE	Department of Hydropower	
	Ministry of Forestry		Dry Zone Greening Department	
	Ministry of Health	MOH	Department of Health	
	Ministry of Industry No. 1			
	Ministry of Industry No. 2			
	Ministry of Mines			
	Ministry of Livestock and Fisheries			
			National Commission for Environmental Affairs	NCEA
			Yangon City Development Committee	YCDC
Philippines			**National Water Resources Board**	NWRB
			National Anti-Poverty Commission - Water and Sanitation Coordination Office	NAPC
			National Economic and Development Authority	NEDA
			Department of Public Works and Highways - Metropolitan Waterworks and Sewerage System - Local Water Utilities Administration	DPWH
			- Bureau of Research and Standards DPWH - Project Management Office – Rural Water Supply - Project Management Office – Major Flood Control Project	
			Department of Agriculture - **Bureau of Soil and Water Management** - Bureau of Fisheries and Aquatic Resources - National Irrigation Administration	DA
			Department of Environment and Natural Resources - Forest Management Bureau	DENR

Country	Ministry	Acronym	Department/ Statutory Body	Acronym
			- National Mapping and Resources Information Authority - Environmental Management Bureau - Mines and Geosciences Bureau - Laguna Lake Development Authority	
			Department of Energy - National Power Corporation - National Electrification Administration	DOE
			Department of Health - Environmental Health Sciences - Bureau of Research and Laboratories	DOH
			Department of Interior and Local Government - Local Government Units - Project Management Office – Rural Water Supply and Sanitation Project	DILG
			Department of Finance - Cooperative Development Authority	DOF
			Department of Transportation and Communication - Philippine Ports Authority	DOTC
			Department of Trade and Industries - Bureau of Investment	DTI
			Department of Science and Technology - Philippine Atmospheric, Geophysical and Astronomical Services Administration	DOST
			- Philippine Council for Agriculture Forestry, Natural Resources and Resource Research and Development - Philippine Aquatic and Marine Research and Development	

Country	Ministry	Acronym	Department/ Statutory Body	Acronym
			Department of National Defence - Office of Civil Defence - Philippine Air Force	DND
Singapore	**Ministry of Environment and Water Resources**	**MEWR**	**Public Utilities Board**	PUB
			National Environment Agency	NEA
Thailand	**Ministry of Natural Resources and Environment**	**MNRE**	**Department of Water Resources**	
			Pollution Control Department	PCD
			Office of Natural Resources and	ONEP
			Environmental Policy and Planning	
	Ministry of Agriculture and Cooperatives	MOAC	Royal Irrigation Department	RID
			National Economics and Social Development Board	NESDB
Vietnam	**Ministry of Natural Resources and Environment**	**MONRE**	**Department of Water Resources Management**	
			National Water Resource Council	NWRC
	Ministry of Agriculture and Rural Development	MARD	**Water Resources Bureau**	
	Ministry of Construction	MOC		
	Ministry of Fisheries	MOFI		
	Ministry of Industry	MOI		

Annex 4.2 – Summary of Institutional Arrangements in Selected Non-ASEAN Countries

ANNEX 4.2 – SUMMARY OF INSTITUTIONAL ARRANGEMENTS IN SELECTED NON-ASEAN COUNTRIES

Common Features	France	UK	Brazil	Australia	Japan	Malaysia
Champion for Water	√	√	√	√	√	X
Constitutional Governance Structure for Water Resources	√	√	√	√	√	X
National Policy/ Framework for Water Resources	√	√	√	√	√	X
Central Planning Agency	√ Central and municipalities	√ by States	√	√	√	√ (States and Federal)
Basic unit of Water Management	Water District/ River basin	River basin	State/ Regional/ District/ River basin area	River basin	Prefectural area	Districts/ Functional areas/ River basin
Decentralised Approach Supported by Enforcement Authority	√	√	√	√	√	Not well defined among the authorities
Adequacy of Localised Technical Capabilities	√	√	√	√	√	X
Levels of Policy Making for the water sector	All levels	Central level	All levels	All levels	All levels/ but not well defined	Central and State levels
Separation of water resources from services	√	√	X	X	X	√
Executive Body in Water Resources Management	Water agencies/ local authorities/ contractors	Environmental agency, local authorities/ water services companies	Federal Water authority/ local authorities/ district/ river basin authorities	State/Regional/ Corporations / local authorities	Local authorities/ corporations	Local authorities

Source: Adapted from study by Deloitte KassimChan (2003).

Annex 4.3 – Summary of The Institutional Arrangements Recommendations by JICA, 1982

ANNEX 4.3 – SUMMARY OF THE INSTITUTIONAL ARRANGEMENT RECOMMENDATIONS BY JICA, 1982

Item	Level	Proposed Agency	Functions	Members
1a	Federal level	National Water Resources Committee (NWRC)	• Appraise in consultation with State Governments, the national water policy and the national water resources master plan prior to approval of the Federal Government. • Appraise in cooperation with the SWRCs, the regional water resources master plan prior to obtaining approval from the Federal and State Governments. • Advise the Cabinet on policy matters related to water resource development and management. • Coordinate water resources development and management programmes for the various water use sectors. • Coordinate the activities of SWRCs. • Consider and to approve guidelines for macro planning in water resources development and management in order to maintain consistency and uniformity. • Designate water resources development and management projects to be undertaken by the WRDMC.	• Director-General of the EPU as Chairman. • Director-generals or their representatives of Federal departments and agencies related to water resources as members. • Representatives of the SWRC included.
1b	Federal Level	Federal Water Resources Division (FWRD) within the Economic Planning Unit in the Prime Minister's Department	• Act as secretariat to the NWRC. • Prepare the national water policy and national water resources plan for appraisal by the NWRC. • Prepare regional water resources master plans for appraisal by the NWRC and the SWRCs concerned. • Prepare guidelines for water resources planning, development and management to maintain consistency and uniformity. • Appraise major water resource development and management projects. • Assist State Governments in matters related to water resource.	

Item	Level	Proposed Agency	Functions	Members
1c	Federal Level	Water Resources Development and Management Corporation (WRDMC)	• Establish to implement and operate certain water resource development projects. • To undertake the construction of water resource development projects such as dams, barrages and diversion facilities designated by the NWRC. • Under the construction of dams, barrages and diversion facilities of state/inter-state water resources development projects at the request of the state(s) concerned. • Undertake the operation of a series of dams. Barrages and diversion facilities within a water resource region in accordance with rules established by agencies/ states concerned.	
2a	State Level	State Water Resources Committee (SWRC)	• Appraise in cooperation with the NWRC, the regional water resources master plan for approval by the State Governments. • Coordinate the preparation of water resources development and management programs and projects by the State Departments and agencies concerned. • Appraise the water resources projects to be implemented in the State. • Approve plans for low flow management and water quality management and to coordinate emergency actions to be taken in the event of a drought or a flood. • Advise State Governments on policy matters related to water resources.	• Secretariat is provided by the SWRD • Director of SEPU as Chairman • State Directors of departments and agencies, district officers as members
2b	State Level	Water Resources Division (SWRDiv) within the State Economic Planning Unit.	• Coordinate the planning of water resources development and management projects in the State. • Prepare plans for low flow management and for river water quality management. • Appraise applications for water licence and make appropriate recommendations. • Appraise applications for abstraction of	

Item	Level	Proposed Agency	Functions	Members
			groundwater and make appropriate recommendation.	

Note: Some of the main organisational structures are seen in the NWRS 2000 – 2050.

Annex 4.4 - Mandate and Responsibilities of SPAN

ANNEX 4.4 – MANDATE AND RESPONSIBILITIES OF SPAN

Mandate	Functions and Responsibilities
• To establish a transparent and integrated structure for water supply and sewerage services that delivers effective and efficient service to consumers. • To ensure long-term availability and sustainability of water supply including the conservation of water. • **To promote the protection and preservation of water-courses and water catchments.** • To facilitate the development of competition to promote economy and efficiency in water supply and sewerage services industry. • To establish a regulatory environment, which facilitate financial self sustainability amongst industry players in the long-term. • To regulate for the long-term benefit of the consumers. • To ensure the provision of affordable services on an equitable basis. • **To improve the quality of life and environment through effective and efficient management of water supply and sewerage services.** • To establish an effective system of accountability and governance between industry and players. • To regulate the safety and security of water supply and sewerage systems.	• Enforcement, supervision and regulation of water supply and sewerage services activities under the Water Service Industry Act (2006) and the Suruhanjaya Perkhidmatan Air Negara Act 2006. • To advise the Minister on all matters in relation to the national policy objectives of the water supply and sewerage services laws and to implement and promote the national policy objectives. • To implement and enforce the water supply and sewerage service laws and to consider the recommend reforms to the water supply and sewerage services industry. • To ensure the productivity of the water supply and sewerage services industry and the monitoring of operator compliance with stipulated services, standards, contractual obligations and relevant laws and guidelines. • To increase concerted efforts towards improving the operational efficiency of the industry and in particular the reduction on non-revenue water through short-term, medium-term and long-term programmes. • To advise the Minister on a fair and efficient mechanism for the determination of tariffs that is fair to both consumers and licensees and to implement tariffs that have been established through appropriate mechanism and tools. • To ensure the national development goals pertaining to coverage, supply, and access to water supply and sewerage services are achieved. • Ensure the implementation of privatisation projects is successful and satisfactory. • Assist in national economic development through modern sewerage sector **development by protecting water resources and the environment.**

REVIEW OF THE NATIONAL WATER RESOURCES STUDY (2000 – 2050) AND FORMULATION OF NATIONAL WATER RESOURCES POLICY

FINAL REPORT, VOLUME 2 – WATER RESOURCES GOVERNANCE
AUGUST 2011

Annex 4.5 – Institutional Arrangements

ANNEX 4.5 – INSTITUTIONAL ARRANGEMENTS

Table A4.5.1 - Summary of Major Federal and State Institutional Arrangements for Water Resources Management

Institution	Membership	Function	Powers	Legislation
National Water Resources Council	• Deputy Prime Minister **Federal Government** • Minister of Finance • Minister of Natural Resources and Environment (NRE) • Minister of Energy, Water and Communications (KTAK) • Minister of Works • Minister of Agriculture and Agro-based Industry • Minister of Housing and Local Government • Minister of Plantation Industries and Commodities **State Governments** • Menteri Besars of Perlis, Kedah, Perak, Selangor, Negeri Sembilan, Johor, Pahang, Terengganu and Kelantan • Chief Ministers of Pulau Pinang, Melaka, Sabah and Sarawak.	• Formulate a National Water Policy; • Facilitate harmonious and synergistic cooperation between Federal and State Governments; • Facilitate development, allocation and management of the national water resources; • Ensure that the development of national water resources is sustainable in terms of quantity and quality; • Ensure that all environmental requirements are adhered to; • Assist in the allocation of water resources for various users and decide priorities during emergencies; • Advise State governments on conservation, protection and gazetting of water catchments; • Collect and collate information on national water resources and water demand.		
Kedah Water Resources Board/ Lembaga Urus Air Negeri Kedah (LUAN)	• Chairman - Menteri Besar of Kedah • Deputy Chairman – State Secretary • State Legal Advisor	• Ensure, maintain and facilitate the integrated and sustainable management of water resources and the water environment of the state such as to ensure the safeguarding	• To approve river basin plans prepared by the Water Resources Director for submission for the approval of the State Authority. • To advise and assist the State	Enakmen Sumber Air Kedah 2008/ Kedah Water Resources Enactment 2008

Institution	Membership	Function	Powers	Legislation
	• State Finance Officer • Water Resource Director • State Director of the Department of Irrigation and Drainage • State Director of the Department of Environment • State Director of the Town and Country Planning Department • State Director of the Department of Forestry • State Director of the Department of Lands and Mines • State Director of the Department of Mineral and Geosciences • State Director of the Water Supply Department • General Manager of the Muda Agriculture Development Authority (MADA) • No more than 2 members appointed by State Authority who has substantial expertise in management and conservation of river basins and water resources Water Resource Director shall act as Secretary of the Board	of the life supporting capacity of water and ecosystems, maximizing of the economic, social and environmental benefits for the present and future generations. • To regulate inter basin transfer of water within the State. • To promote and facilitate cooperation and coordination between different agencies for multi functional uses of water resources. • To coordinate the exploration and development of additional water resources. • To develop its capacity and expertise to act as the central point of reference for integrated water resource management issues in the State. • To advise the State Authority in respect of Inter-State management and transfer of water.	Authority in formulating or reviewing legislations, directives and procedures with the aim of promoting or facilitating the implementation of integrated water resources management. • To approve development projects that relate to integrated water resources management for submission to appropriate State or Federal Authorities with a view to obtaining the required funding and technical assistance. • To divide the State into river basin districts, designate and determine their boundaries for proper management by River Basin Committees. • To approve and issue guidelines, performance standards, methods and procedures pertaining to the management, utilisation and conservation of water resources. • To issue to Relevant Agencies and any other person, such directives as it deems necessary. • To do all necessary for or incidental to the discharge of its functions.	
Selangor Water Management Authority/ Lembaga Urus Air Selangor	• Chairman – Menteri Besar Selangor • Deputy Chairman – State Secretary	• Provide advise to the State Authority as to the policies, methods and measures to be adopted to promote, nurture and facilitate the sustainable	• Conduct surveys, carry out feasibility studies and collect information for research and the drawing up of management and conservation plans	Selangor Water Management Authority Enactment 1999

Institution	Membership	Function	Powers	Legislation
	• State Legal Advisor or representative • State Financial Officer or representative • Two members of the State Executive Council appointed by the Menteri Besar • Director of the Federal Drainage and Irrigation Department • No more than 5 members appointed by State Authority who has substantial expertise in management and conservation of river basins, ground water and water resources The Director shall be the Secretary of the Authority	development, efficient use and conservation of water sources for public purpose. • Develop, implement and promote infrastructure projects for multi functional purposes. • Regulate and control inter basin transfer of water within State. • Develop and implement guidelines, performance standards, methods and procedures pertaining to the management, utilisation and conservation of water sources. • Coordinate multi agency relationships in the State and promote cooperation and coordination for multi functional uses of water sources. • Adopt and implement policies, plans or projects by the Federal government as directed by the State Authority. • Undertake research pertaining to the management, efficient use, development and conservation of water sources and resources therein. • Provide training and maintain facilities for training related to the functions of the Authority. • Advise the State on the declaration of designated and protected areas and formulate and implement development and management plans	for any water sources. • Formulate, approve and implement management and development plans for water sources and carry out any works in relation thereof. • Formulate and approve changes and fees for the use of water sources and there resource therein. • Advise the State Authority on the designation of any are as a designated area or protected zone for better protection, control and management of such areas. • Regulate and control any resource alteration activity and actions of persons and bodies relating to any water source. • Prescribe and levy fees, payments and any other charges in relation to the performance of its functions and the exercise of its powers under the Enactment. • Construct, maintain, repair, restore, rehabilitate and use any structures, buildings or works within the limits of any water sources. • Regulate the issue of licenses and permits upon such terms and conditions deemed necessary on entry to and exit from any designated or protected areas, or the carrying on of any resource alteration activities	

Institution	Membership	Function	Powers	Legislation
		for such areas. • Protect the interests of the State in respect to the development, management, use and conservation of water sources. • Manage and control he installation, operations and maintenance of places and equipment belonging to the Authority. • Protect the interests of consumers of water in relation to quantity, quality, and the prices to be charged for water supply. • Encourage the formation of stakeholder organizations to assist the Authority in he sustainable development and conservation of water sources. • Grant license on such conditions as the Authority may think fit to any public authority or person to undertake any activity related to water sources and to regulate any activity related to water sources and to regulate the licensees and their activities. • Privatise, with the approval of the State Authority, any of its undertakings pursuant to the provisions of the Enactment. • Investigate any incident, infringement or accidents occurring on or in elation	within the limits of any water source and to impose fees payable on issue of such licenses and permits. • Advise the State Authority in respect of the transfer of water from, between and among States. • Coordinate the activities of public authorities, stakeholder organizations and any other person on matters pertaining to the efficient management, sustainable use and conservation of water sources. • Appoint or employ agents, technical advisors, consultants or other persons to transact any business or enter into contracts for the carrying out of any works, for sharing of profits or joint venture with any person or body of person. • Acquire by purchase, gift or otherwise and dispose of or otherwise deal with movable and immovable properties and any interests therein, upon such terms and conditions as the Authority sees fit. • Do or carry out any act as may appear to the Authority requisite, advantageous or convenient to be transacted or done in the execution of its duties or the better carrying out into effect the purpose of this	

Institution	Membership	Function	Powers	Legislation
		to water resources. • To do such other things as deems fit to enable it to perform its functions effectively or which are incidental to the performance of its functions.	Enactment. • Exercise all functions and powers and perform all duties which under or by virtue of any other written law may be vested or delegated to it.	
Pahang State Water Authority		• Overall responsibility for the control, management and regulation of water resources and raw water in the State of Pahang. • Authorise any supply authority or person to carry out the control and management of water resources and raw water.	• Declaration of catchment area and water supply area. • Licensing for raw water supply. • Imposition of raw water charges and deposits. • Enforcement of provisions concerning pollution, damage of raw water supply system and diversion of water resources. • Regulation of raw water abstraction • Restriction of development of river systems and wells.	Enakmen Sumber Air Pahang 2007/ Water Resources Enactment Pahang 2007
Negeri Sembilan State Water Authority		• To advise State Authority on matters relating to water resources. • To coordinate policies in relation to the usage of raw water and provide advise to the State Authority as to the policies, methods and measures to be adopted to promote, nurture and facilitate the sustainable development, efficient use and conservation of water resources for public purpose. • To regulate and control the allocation of inter basin transfer of raw water from, between and among states.		Enakmen Air (Pindaan Akta Air 1920) 2007

Institution	Membership	Function	Powers	Legislation
		• Advise the State Authority on the declaration of water catchment areas. • To coordinate, promote and implement policies to ensure the continuity and quality of raw water. • To promote the importance , and to encourage the efficient use of supply of raw water. • To do such other things as deemed fit to enable it to perform its functions effectively or which are incidental to the performance of its functions.		
Sabah Water Resources Council	• Chairman • Permanent Secretary of the Ministry of Culture, Environment and Tourism or authorized representative • Secretary of the Council - Secretary for Natural Resources or authorized representative • Director of the Department of Lands and Surveys or authorized representative • Director of the Forestry Department or his authorized representative • Director of the Department of Agriculture or authorized representative • Director of Water Resources or his authorized representative	• Advise the Minister on the management and use of water resources. • Report to the Minister on the condition of water resources. • Make recommendations on the improvement of the quantity and quality of water for the benefits of human use, the aquatic flora and fauna and the aquatic environment, including wetlands and floodplains. • Determine those water activity license applications which have State or regional significance or are of particular significance in a local area. • Adopt and review plans for the orderly and effective development of water resources. • Set priorities for, ensure the		Enakmen Sumber Air Sabah 1998/ Sabah Water Resources Enactment 1998

Institution	Membership	Function	Powers	Legislation
	• Director of the State Economic Planning Unit or his authorized representative • Director of the Department of Town and Regional Planning or his authorized representative • Director of the Department of Irrigation and Drainage or his authorized representative • Director of the Fisheries Department or his authorized representative • Director of the Water Department or his authorized representative • Director of the Department of Ports and Harbors or his authorized representative • Director of the Federal Department of Environment (Sabah Region) or his authorized representative • Director of the Department of Geological Surveys or his authorized representative • Two other members with appropriate technical or academic expertise in matters related to water resources	development of, recommend for approval and review catchment management plans developed under Part VI and other plans for the improvement of the management of water resources. • Develop and issue, with the approval of the Minister, State policies and guidelines for the management and protection of water resources. • Require public authorities to take action to implement the recommendations of an approved catchment management plan including taking enforcement action where relevant. • Act to minimize or prevent harm to water resources.		
Sarawak Water Resources Council	• Chairman - State Secretary or his nominee • Deputy Chairman - State Financial Secretary or his	• To identify all available water resources in the State and. to promote the conservation, augmentation, development,		Sarawak Water Ordinance 1994

Institution	Membership	Function	Powers	Legislation
	nominee • The Permanent Secretary to the Ministry of Resource Planning or his nominee • The Director of State Planning Unit or his nominee • The health authority or his nominee • The Director of Public Works or his nominee • The Director of Irrigation and Drainage or his nominee • Not less than two but not more than five other members appointed by the Yang di-Pertua Negeri.	management and proper use of these water resources. • To promote the integration of water resources and land-use, planning and management in the State. • To broadly monitor the plans and actions of any Government agencies or private agencies which may significantly affect the quality or quantity of the water resources of the State. • To advise the Government on: (i) the conservation, protection, development and management of the water resources of the State (ii) water and related land-use and environmental issues (iii) the formulation of policies and strategies to develop, manage and conserve water resources (iv) the system of supply and distribution of water in the State (v) subject to any guidelines and directions provided by the Natural Resources and Environment Board, the policies to be adopted in relation to the use, development and management of water resources • To consider any matter affecting water resources referred to it.		

Institution	Membership	Function	Powers	Legislation
		• In collaboration with the appropriate Government departments and agencies of the State or with any person or body, to initiate, conduct, or arrange studies, investigations and research relating to the water resources of the State in general and the availability and use of such water resources in particular. • On its own initiative, to make representation, to tender advice, and to make reports to the Government on any matter relating to the development, conservation and management of the Water resources of the State. • In consultation with the health authority to ensure that the standards for safe drinking water are maintained by a water supply authority. • To promote and undertake measures to foster public awareness and understanding the conservation, management and use of such water resources. • To carry out or undertake such other functions as the Yang di-Pertua Negeri may require or direct or as may be conferred by this Ordinance or any other written laws.		

Table A4.5.2 - Summary of Major Federal and State Ministries and Organizations and their Functions Related to Water Resources Management

Organisation	Vision and Mission	Functions
Prime Minister's Office	**Vision** To foster an office which embodies the Prime Minister's leadership vision towards an innovative government of excellence and integrity, in serving the people and the nation. **Mission** It is our mission to provide a conducive environment to assist the Prime Minister in carrying out his duties and responsibilities effectively, efficiently and in a timely manner.	• To carry out staff functions and duties related to specific fields as directed by the honourable Prime Minister. • To handle work plans and office management. • To prepare and coordinate draft of speeches, addresses and other forms of statements by honourable Prime Minister. • To ensure suitable mass media coverage for the honourable Prime Minister's activities.
Economic Planning Unit	**Mission** "We strive to be the centre of excellence in economic development planning for Malaysia" **Objectives** • To enhance Malaysia's socio-economic development towards achieving a developed-nation status by the year 2020. • To improve the quality of life of all Malaysians and promote balanced and sustainable development through effective development planning. • To strengthen internal resilience and international competitiveness and • To promote optimum utilization of available resources.	• Formulate policies and strategies for socio-economic development; • Prepare medium and long-term plans. • Prepare development programmes and project budget. • Monitor and evaluate the achievement of development programmes and projects. • Advise Government on economic issues. • Initiate and undertake necessary economic research. • Plan and coordinate the privatization programme and evaluate its achievement. • Coordinate Malaysia's involvement in the development of the Growth Triangle Initiatives. • Initiate and coordinate bilateral and multilateral assistance. • Monitor and evaluate investment activities to ensure they are in line with the corporate equity restructuring objective.
State Economic Planning Unit	Similar to EPU but at State Level	Similar to EPU but at State Level
Pengurusan Aset Air Berhad/ Water Asset Management Company	**Vision** To Be A World Class Water Asset Provider **Mission** • Commit to excellence in managing water assets, founded on the highest standards of ethics and technical innovation. • Promote continuous improvement in our business processes	• Construct, refurbish, improve, upgrade, maintain and repair water infrastructure and other related assets related to water systems. • Source and obtain competitive financing for the development of the nation's water asset and lease such assets to water operators licensed by SPAN for operation and maintenance.

Organisation	Vision and Mission	Functions
	through the provision of the highest Level of Services. • Make a positive difference in the quality of water assets in supporting the delivery of quality water services to the consumer. • Add value to the industry by providing the most innovative solutions in the management of water assets.	• Assist SPAN in restructuring the nation's water industry.
Indah Water Konsortium	**Vision** To be the most efficient environment caring sewerage company **Mission** Highly committed to providing efficient sewerage services to all customers besides striving towards developing the national sewerage system that will collectively contribute towards a sustainable and friendly environment	• Operating and maintaining the public sewage treatment plants and network of underground sewerage pipelines. • Appointed by Suruhanjaya Perkhidmatan Air Negara (SPAN) as Certifying Agency for Sewerage Works Approvals in accordance to Section 174 of Water Services Industry Act 2006 (Act 655) for all state in West Malaysia and Wilayah Persekutuan Labuan except the state of Kelantan. • Conduct R&D on sewerage related projects. • Carry out desludging services for residential IST, private STPs and pour flush toilets. • Carry out awareness and educational programs.
Ministry of Energy, Green Technology and Water	**Vision** To be the forefront in sustainable development of the energy, water and green technology industry for the Country **Mission** • To draft policies to act as the institutional framework and effective management • To determine the direction of the energy, green technology and water industry in line with the national development goals • To develop a management system and monitoring mechanism that is effective	• Ensure effective implementation of policies related to the energy, water and green technology industry. • Ensure integrated and adequate coverage of infrastructure according to standards and on time delivery. • Provide a conducive environment for development of industry and technology. • Ensure sustained research and development to increase use of technology. • To ensure effective and cost effective delivery of services. • Ensure mechanism for monitoring are in place in line with current legislation. • To continuously improve capacity building of the organization to achieve the goals of the industry and green technology.
Suruhanjaya Perkhidmatan Air Negara/ National	• To establish a transparent and integrated structure for water supply and sewerage services that delivers effective and efficient	• Advise the Minister to promote and implement matters relating to national policy objectives for water supply and sewerage services.

Organisation	Vision and Mission	Functions
Water Services Commission	service to consumers. • To ensure long term availability and sustainability of water supply including the conservation of water. • To promote the protection and preservation of watercourses and water catchments. • To facilitate the development of competition to promote economy and efficiency in water supply and sewerage services industry. • To establish a regulatory environment which facilitates financial self sustainability amongst industry players in the long term. • To regulate for the long-term benefit of the consumers. • To ensure the provision of affordable services on an equitable basis. • To improve the quality of life and environment through effective and efficient management of water supply and sewerage services. • To establish an effective system of accountability and governance between industry and players. • To regulate the safety and security of water supply and sewerage systems.	• Implement and enforce water supply and sewerage services laws and to recommend reforms. • To ensure productivity of water supply and sewerage services industry and to monitor operator compliance. • Improve operational efficiency of industry particularly for non revenue water reduction. • To advise the Minister on fair and efficient mechanism for determination of tariff. • To ensure national development goals pertaining to coverage, supply and access to water supply and sewerage services. • To ensure long-term sustainability of quality of water and sewerage services through continued capital works development and effective asset management. • To plan and formulate policy and general proposals in respect to the development of new sewerage systems and measures to improve existing systems.
Energy Commission	**Vision** The Energy Commission strives to be a highly recognized and effective energy regulator as well as the authority on energy matters **Mission** The Energy Commission aims to balance the needs of consumers and providers of energy to ensure safe and reliable supply are reasonable prices, protect public interest, foster economic development and competitive markets in an environmentally sound manner	• Enforcement, supervision and regulation of energy industries and electricity services under the Energy Commission Act 2001 and the Energy Commission Act 2001.
Jabatan Bekalan Air/ Water Supply Department	**Vision** To provide sufficient, safe, quality and reliable water supply for the whole nation to satisfy the needs of the people and nation	• To provide technical advisory services to the ministry and other agencies in planning, designing, implementing and managing water supply programmes. • To plan, implement, coordinate and monitor national water supply

Organisation	Vision and Mission	Functions
	Mission • To provide technical advisory services to the ministries and other agencies in planning, designing, implementation and managing water supply programmes. • To ensure sufficient, quality and reliable water supply for the public and industry.	development programmes/ projects to meet the target that fulfil the needs of the people and nation. • To plan, monitor and implement the development of water resources. • To monitor the quality of raw water at intakes in Malaysia and of treated water in Sabah and Sarawak. • To carry out safety monitoring on high-risk water supply dams and tanks on slopes. • To serve as committee member (SIRIM and SPAN) in preparing the list of approved materials for water supply projects. • To act as certifying agent for the Sungai Langat Water Treatment Plant implemented by PAAB. • To plan, implement and monitor NRW programmes. • To plan, prepare and maintain water supply infrastructure for domestic and industrial requirements in Labuan Island.
Federal Territory of Labuan Water Supply Division	**Vision** Create adequate water supply system, safe, good quality and sustainable around the nation for public satisfactory and Nation's need **Mission** • To provide technical advisory services to the ministries and other agencies in planning, designing, implementation and managing water supply programmes • To ensure sufficient, quality and reliable water supply for the public and industry	• Operation and maintenance of water supply services in the Federal Territory of Labuan.
Puncak Niaga Sdn Bhd	**Vision** To be the leading and dynamic integrated water services company **Mission** • To provide a synergy of socio-economic products and services in the realm of water treatment, management and distribution, and other related businesses. • To cater to the increasing challenges in the demand for high quality	• Operation, maintenance, management, construction, rehabilitation and refurbishment of water treatment facilities. • Supply and distribution of treated water within the State of Selangor and the Federal Territories of Kuala Lumpur and Putrajaya. • Undertaking research and development and technology development for the water, wastewater and environment sectors.

Organisation	Vision and Mission	Functions
	water production and distribution through the continuous implementation of high quality standards, efficient services, human resources development, innovative technology and operational systems. • To actively participate in regional and global business opportunities with linkages to the Company's core activities and related interests. • To actively support and participate in programmes and activities aimed at uplifting the community's living standards and value systems in line with the aspirations of Vision 2020. • To address national and international concerns pertaining to the protection, conservation and enhancement of the natural environment we live in.	
Jabatan Perkhidmatan Pembentungan/ Sewerage Services Department	**Vision** Committed in the development a world-class sewerage system **Mission** As the best technical department in providing appropriate and adequate sewerage infrastructure, to ensure continued protection of public health and protection of the country's water source	• Planning, designing, implementing and monitoring the sewerage services projects under the Government development expenditure. • Plan, supervise and enforce all the legislations and law pertaining with national sewerage sector according to Sewerage Services Act 1993. • Encourage implementation fluency suitable and modern sewerage system throughout the country according to standard that is set. • Encourage and develop the sewerage industrial in a way that can be efficient in cost, technology and workforce resources. • Protect consumer interest by ensuring best services in reasonable costs.
Ministry of Natural Resources and Environment	**Vision** To lead in sustainable management of natural resources and conservation of environment towards achieving national vision. **Mission** • Integrated planning of activities and programmes by the departments and agencies. • Optimization of manpower utilization, hi-end technologies and financial resources	• Legislate policy, laws, procedure and guidelines related to natural resources management and environmental conservation. • Monitor, coordinate and assess the implementation of policy, laws, procedure, guidelines and services while performing continuous restoration on natural resources management and environmental conservation. • Manage training programmes and human resource development to produce competent working society and members of knowledge society.

Organisation	Vision and Mission	Functions
	• Maximization of natural resources development in order to support value added activities • Enhancement and reinforcement of research and development activities • Effective dissemination and sharing of technical inputs and database management. • Effective cooperation among public, private and international sectors. • Enhancement of expertise and knowledge through effective and systematic training modules.	• Provide adequate infrastructure and tools to equip departments and agencies. • Inspire research and development (R&D) efforts in natural resources management and environmental conservation to enhance value added natural development. • Ascertain and maintain boundary issues to assure national interest, sovereignty and security. • Leading in information establishment and management of national geospatial and aspatial. • Ensuring natural resources planning and development with environmental conservation are well integrated. • Coordinate, supervise and enforce the legislations of natural resources management and environmental conservation. • Acts as a focal point for multi-lateral negotiations focusing on natural resources and environmental matters. • Safeguarding national interest in regional and international negotiations in terms of natural resources and environment. • Enhancing public awareness and public support in identifying the importance of well balanced utilization of natural resources and conservation of the environment. • Establish smart partnership among various authorities in managing natural resources and environment. • Ensure continuous improvement of the service delivery system in managing natural resources and environment.
Department of Environment	**Vision** Environmental Conservation for the Well-being of the People. **Mission** To ensure sustainable development in the process of nation building.	• Perform functions and exercise powers under the Environmental Quality Act 1974 and Part IV of the Economic Zone Act 1984. • Administration of activities for the prevention and control of environmental pollution. • Administration of activities for the protection and enhancement of environment quality.
Department of Irrigation and	**Vision** To be a world class organisation by 2010	• Implementation of planning and development of flood and drought forecast system, management of hydrological data and information

Organisation	Vision and Mission	Functions
Drainage	**Mission** • To manage water resources, river basins, flood risks and coastal zones to achieve environmental sustainability and enhanced quality of life.	and assessment and management of national water resources. • Development of planning and management of river basins. • Enhancing the planning and development of infrastructure as well as water management for crops and other agricultural needs. • Development of planning and management of flood mitigation programmes. • Implementation of development and management of coastal zones to reduce erosion and sedimentation problems at river mouths. • Managing and regulating the implementation of storm water in town areas management programmes. **Divisions** • Flood Management Division • River Division • Coastal Division • Water Resources Management and Hydrology Division • Urban Stormwater Division • Design and Dam Division • Special Projects Division • Quantity Survey and Contract Administration • Mechanical and Electrical Services Division • Corporate Division • Management Services Division • Human Capital Development Division • Humid Tropics Centre Division • SMART Control Centre Division • Information Management Division • Performance Audit Division • Building and Infrastructure Division
Department of Mineral and	• To provide mineral commodity information to enhance the growth of the mineral based industries.	• Performing functions and exercising powers under the Geological Survey Act 1974, Mineral Development Act 1994 and Tin Control Act

Organisation	Vision and Mission	Functions
Geosciences	• To encourage the optimal use of geosciences information and services for the sustainable development of the country. • To ensure the mineral resources are exploited in a systematic, safe, efficient and environmentally friendly manner as well as to secure their maximum returns to the country. • To encourage and diversify the use of local mineral resources so as to contribute towards the development of the country's industrilisation through research and development (R&D) activities. • To provide expert services in the fields of minerals, geosciences and mining at national and international levels so as to promote investments in the mineral sector and for national development planning.	1954. • Undertaking systematic mineral exploration • Undertaking systematic investigations in various geoscience disciplines. • Providing geochemical analysis and physical tests on rock materials and minerals. • Acting as the national depository for all information related to geosciences and mineral resources of the country. • Collection, analysis and dissemination of data and information relating to mineral exploration, mining and related activities. • Providing technical advisory services and expertise in the fields of mineral, geoscience, mining and quarrying. • Assisting the private sectors and industries in developing mineral sectors. • Ensuring minerals mining and related activities are carried out safely, efficiently and systematically. • Implementation of Government policies and directives.
Department of Forestry	**Vision** • To become the main agency in sustainable management of tropical forestry **Mission** • To manage and develop forestry resources in a sustainable manner and to optimise the contributions towards socio-economic development of the country. **Objectives** • To manage the forestry resources of the country for sustainable and optimum use and services of forestry resources in line with the needs of the environment. • To increase the supply of forestry resources and services through suitable forestry activities in improving the quality, productivity and	• In charge of the management, planning, protection and development of Permanent Forest Reserves (PFR) in line with the National Forestry Policy (NFP) 1992 and the National Forestry Act 1984.

Organisation	Vision and Mission	Functions
	use of forestry resources. • To continuously develop technology that is suitable with the needs of the environment for conservation, management and use of forestry resources. • To conserve and protect the diversity of forestry ecosystems, water and land and its continued use. • To increase the quality and efficiency of wood processing factories based on forest production and to increase the number of downstream industries by increasing through value adding. • To improve the development of manpower resources to suppot the forestry sector. • To increase public awareness on the role of forests towards the environment and to conserve through education as a medium to spread information. • To increase the contributions of the forestry sector to the national income, foreign exchange and employment opportunities.	
Department of Wildlife and National Parks (PERHILITAN)	**Vision** • To be an excellent institution in the conservation and sustainable management of biodiversity towards a developed nation **Mission** • To lead the integration and implementation of conservation programme and sustainable management of the nation's biodiversity efficiently and effectively. **Objectives** • Protection, management and preservation of biodiversity for optimum benefits. • Protection and development of protected areas for research, education, economic, aesthetic, recreation and ecological purposes • Enhancement of knowledge, awareness and public support on the needs and importance of biodiversity conservation.	• Perform functions and exercise powers under the National Parks Act 1980, Protection of Wild Life Act 1972, Taman Negara (Pahang) Enactment 1939, Taman Negara (Terengganu) Enactment 1939, Taman Negara (Kelantan) Enactment 1938. • Management of wildlife conflicts that cause damage to crops and properties. • Management of protected areas, national parks, wildlife reserves and wildlife sanctuaries. • Co-ordination of keeping and caring of wildlife in zoological parks. • Management and control of international wildlife trade as the Management Authority under the international trade in endangered species act 2008. • Management and implementation of wildlife captive breeding programmes.

Organisation	Vision and Mission	Functions
Jabatan Ketua Pengarah Tanah dan Galian	**Vision** Towards a First Class management and administration of land **Mission** • To provide professional and integrity in management and administration of land in line with the National Development Policy through: • Improvement in human resource development, use of latest technologies and optimum management of funds • Improvement in research and development activities • Management, dissemination and sharing of database in an efficient manner • Improve cooperation with all sectors at the international level	As the prime mover in the management of land in the country encompassing: • Revision of legislation involving land management • Management of records for Federal Lands • Land acquisition for Federal Projects • Rental and enforcement of Federal Land assets • Management of distribution of small inheritance
Marine Parks Department/ Jabatan Taman Laut	**Vision** To become the major agency in the management of natural resources and environment for marine environments with the best in the world **Mission** To manage natural resources to sustainable levels as well as to protect the marine ecosystem in an integrated manner based on scientific facts and the involvement of all stakeholders.	• Bahagian Khidmat Pengurusan • Bahagian Perancangan dan Pengurusan Taman Laut • Bahagian Pendidikan dan Intepretasi Maklumat • Bahagian Penyelidikan dan Inventori Sumber • Bahagian Penguatkuasaan dan Pelesenan • Bahagian Kejuruteraan
National Hydraulic and Research Institute of Malaysia (NAHRIM)	**Vision** • To be the premier hydraulic research centre for water and its environment in the world by 2030 **Mission** • To provide excellent services as an expert centre on water and its environment management to ensure sustainable growth in order to improve the quality of life and well being	• To conduct basic and applied research in the water sector such as water source, rivers, coastal, geohydrology and water quality. • To provide supporting services to all parties particularly the private and public sector in addressing problems relating to water and its environment. • To act as the national focal centre in research relating to water and its environment and to act as the coordinator at the federal level in related research and to take part in international research activities. • To act as advisor for all matters relating to water and its environment in ensuring sustainable economic development for the country.

Organisation	Vision and Mission	Functions
Ministry of Agriculture and Agro based Industry	**Vision** Forefront in Agriculture Transformation. **Mission** • To transform the agriculture and agro-based industry into a modern, dynamic and competitive sector • To position Malaysia as a major world food exporter. • To develop the agriculture sector as the country's engine of growth.	• To plan and formulate relevant policies, strategies and Agricultural Development Programmes. • To evaluate and coordinate the implementation of Agricultural Development programmes/project. • To carry out agriculture related data and information collection and economic analysis based on the collected data and information. • To plan and put in place publicity programmes for advisory and research services as well as for agricultural information management system. • To ensure the ministry's participation in international programmes and assignments. • To be a one stop agency on agro-food related expert and advisory services to the private sector.
Department of Agriculture/ Jabatan Pertanian	• To provide consultancy, technical support and advisory services in various agricultural fields, particularly in food crops and agro-processing industries in various agricultural fields, particularly in food crops and agro-based industries to ensure sufficient food production. • To guide and develop successful agricultural entrepreneurs in order to increase farm productivity and the national agricultural production • To develop trained and skilled manpower in the agricultural sector. • To protect agricultural crops from pests and diseases through crop protection programmes and plant quarantine services. • To ensure the production of food crops which are safe for consumption and to protect the environment through control of pesticides. • To control plant and germplasm materials of economic importance from being freely taken out of the country.	• To evaluate, modify and formulate technology packages from research institutions to suit localized conditions prior to its transfer to agricultural entrepreneurs. • To provide consultancy and technical support services in a package to entrepreneurs, private sector and agricultural development agencies. • To develop a national Source of Agricultural Information for purposes of planning and development of agricultural projects. • To conduct training at the Agricultural Institutes/ Agricultural Training Centres to fulfill the demand for skilled manpower in the agriculture sector. • To control the quality of seeds and planting materials produced and distributed in the Country. • To enforce the Pesticides Act 1974 to ensure that all pesticides imported, manufactured and sold in the country are of high quality and do not have adverse effects on humans, food crops and the environment. • To enforce the Plant Quarantine Act 1976 to control the entry of foreign noxious pests and diseases and to facilitate the export of

Organisation	Vision and Mission	Functions
		plants and plant products in order to fulfill the phytosanitary requirements of importing countries. • To enforce the Customs Order (Prohibition of Exports) 1988 and CITES Agreement to prevent plant species of economic importance from being freely brought out of the country and to prevent the extinction of endangered wild plant species. • To establish linkage and cooperation with the public and private sectors involved in the development, enforcement and trade in agriculture at both the national and international level.
Malaysian Agricultural Research and Development Institute (MARDI)	**Vision** To be a world-renowned R&D organisation in food, agriculture and bio-based industries by 2015. **Mission** To create, innovate, transfer and apply knowledge, competencies and services to transform the national food, agriculture and bio-based industries towards increased commercialisation and competitiveness. **Business** • To carry out research to generate innovative technologies for the development of the food and agriculture industries. • To provide consultancy and technical services to support the development of food and agriculture industries. • To offer joint ventures and licensing arrangements for the commercialisation of research results.	• Performing functions and exercising powers under the Malaysian Agricultural Research and Development Institute Act 1969.
Kemubu Agricultural Development Authority (KADA)	• To be an agency of excellence towards the increase of socio-economic standards of farmers and standards of food production of the State. • To produce padi crops and rice to sustain the needs of the State. • To produce other food products to meet local demands and sustain consumption needs of the State. • To develop downstream agro-based industries that rely on local	• To carry on all activities the carrying on whereof appears to it to be requisite, advantageous or convenient for or in connection with the discharge of its said functions, including the manufacturing, assembling, processing, packing, grading and marketing of products, research and training; • To co-operate with or act as agent or managing agent of or otherwise act in association with or on behalf of the Government of the

Organisation	Vision and Mission	Functions
	ingredients. • To develop and strengthen the institutional state of farmers so they are able to support their families. • To increase per capita income of farmers and their families on par with the per capita income of the State.	Federation or of the State, any public authority, any company, any corporation, any body or any person; • To promote and co-ordinate the carrying on of such activities by the Government of the Federation or of the State, public authorities, any company, corporation, or other body or person; • To establish or expand, or promote the establishment or expansion of companies, corporation or other bodies to carry on any such activities either under the control or partial control of the Authority or independently; • To give assistance to any public authority, company, corporation or other body or person appearing to the Authority to have facilities for the carrying on of any such activities, including financial assistance by the taking up of share or loan capital or by loan or otherwise; • To purchase, underwrite or otherwise acquire any stock and shares in any public or private company, and to dispose of the same on such terms and conditions as the Authority may determine; • To require departments, and governmental and non-governmental agencies engaged in carrying out or intending to carry out development in the Kawasan Kemubu to submit report regarding their activities or proposed activities containing such particulars and information as may be specified by the Authority; • To appoint agents or establish such other bodies as it may deem fit for the purposes of carrying out its functions; To impose fees or any other charges it deems fit for giving effect to any of its powers or functions; • To receive, in consideration of the services rendered by it, such commission or payment as may be agreed upon; • To regulate development in the Kawasan Kemubu; and • To do such other things as it deems fit for the effective carrying out of its functions and powers.
Muda Agricultural Development	**Vision** To be the lead agency in the development of a modern, efficient and	• To carry on all activities the carrying on whereof appears to it to be requisite, advantageous or convenient for or in connection with the

Organisation	Vision and Mission	Functions
Authority (MADA)	stable rice industry in Malaysia, and also as the prime mover in the socio-economic development of the farming community in the Muda area **Mission** • To transform the rice industry to a modern, efficient, sustainable and competitive sector. • To encourage the farmers' involvement in the whole value chain of the paddy and rice industry. • To maximize the income of the farmers through diversified sources. • To develop Farmers' Institutions as an economic entity that is competitive and viable.	discharge of its said functions, including the manufacturing, assembling, processing, packing, grading and marketing of products, research and training. • To co-operate with or act as agent or managing agent of or otherwise act in association with or on behalf of the Government of the Federation or of a State, any public authority, any company, any corporation, any body or any person. • To promote and co-ordinate the carrying on of such activities by the Government of the Federation or of a State, public authorities, any company, corporation, or other body or person. • To establish or expand, or promote the establishment or expansion of companies, corporation or other bodies to carry on any such activities either under the control or partial control of the Authority or independently. • To give assistance to any public authority, company, corporation or other body or person appearing to the Authority to have facilities for the carrying on of any such activities, including financial assistance by the taking up of share or loan capital or by loan or otherwise. • To purchase, underwrite or otherwise acquire any stock and shares in any public or private company, and to dispose of the same on such terms and conditions as the Authority may determine. • To require departments, and governmental and nongovernmental agencies engaged in carrying out or intending to carry out development in the Kawasan Muda to submit report regarding their activities or proposed activities containing such particulars and information as may be specified by the Authority. • To appoint agents or establish such other bodies as it may deem fit for the purpose of carrying out its functions. • To impose fees or any other charges it deems fit for giving effect to any of its powers or functions. • To receive, in consideration of the services rendered by it, such commission or payment as may be agreed upon.

Organisation	Vision and Mission	Functions
		• To regulate development in the Kawasan Muda. • To do such other things as it deems fit for the effective carrying out of its functions and powers.
Ministry of Science, Technology and Innovations	• To generate knowledge to spur the economic advancement through human capital and intellectual property development. • To value add the existing source of wealth and create new sources towards elevating national competitiveness and ensuring economic advancement. • To enhance societal well-being and improve the standard and quality of life.	• Formulation of national policy in the development of science, technology and innovation. • Promotion of on-going effort towards research and development in science, technology and innovation. • Promoting the commercialization of research and development products. • Formulation, monitoring and coordinating the implementation of national policy on information and communication technology (ICT) • Co-ordination of the development of information technology and communication technology (ICT) and multimedia. • Formulating, monitoring and coordinating the implementation of national biotechnology policy. • Promoting the understanding, awareness and appreciation on science, technology and innovation. • Secretariat for National Innovation Council (NIC). • Secretariat for National Information Technology Council (NITC).
Academy of Science/ Akademi Sains	To pursue, encourage and enhance excellence in the field of Science, Engineering and Technology, for the development of the nation and the benefit of mankind.	• To promote and stimulate the development of science, engineering and technology. • To prepare reports, papers and other documents relating to the national policy on science, engineering and technology and to present recommendations for the Government's consideration.
Ministry of Housing and Local Government	**Vision** • Towards establishing continual and sustainable living environment for all levels of Malaysian society inline with vision 2020 **Mission** • Planning, coordinating and implementing excellent human settlement through comprehensive housing programs, uniformed	• Planning and implementation of KPKT policies to achieve primary national development goals. • Provision of adequate housing for all citizens, particularly for the low-income group. • Setting up of Local Authorities which are strong and able to contribute to the establishment of a progressive society and a clean and healthy environment.

Organisation	Vision and Mission	Functions
	development control with integral infrastructure facilities, social and recreational services towards building a dynamic society. Objectives • To establish and implement comprehensive and uniform nationwide rural and urban planning to strengthen and promote physical, social, economic and environmental development. • To encourage, develop and guide Local Authorities to establish high quality urban, social and recreation services and to provide opportunities for uniform economic growth. • To ensure adequate comfortable and balanced housing development, complete with social and recreational facilities. • To ensure the safety of life and property through preventive and supervisory services regarding fire and dangerous materials, efficient and effective emergency and rescue services and the raising of public awareness and education on fires and fire prevention. • To develop landscaping, parks, and quality recreational facilities and achieve the objective of making Malaysia a garden nation.	• Provision of efficient Fire and Rescue Services for the safety of life and property. • Strengthening and implementation of physical, social, economic, and town and country environment planning in accordance with the Town and Country Planning Act. 1976.
Department of Town and Country Planning/ Jabatan Perancangan Bandar dan Desa	• To strengthen the physical, social and economic development system in urban and rural areas in an effort to upgrade the standard of living in line with the national objective. • To organize, regulate and coordinate land development, usage and conservation through the implementation of the Town and Country Planning Act and other related Acts. • To draft and implement planning methodologies, policies, plans and guidelines, as well as to ensure their effective usage by all agencies in the planning level. • To ensure quality town planning and information system service for the long term planning needs.	• Secretariat for the National Physical Planning Council established under the Town and Country Planning Act 1976. • Registration of town planners. • Advises the Federal Government on all planning matters in relation to land use and development. • Promotes a comprehensive, effective and efficient planning system through planning laws, methodology, research, standards and procedures. • Translates the national socio-economic policy into a physical and spatial form in accordance with the land use formula and settlement programme and policies. • Assists the State Government, local authorities and government agencies in preparing Development Programmes, i.e. State Structure.

Organisation	Vision and Mission	Functions
		Plans, Local District Plans and Special Area Plans
Local Government Department	• Guide and promote local authority in planning, control and implementation of development, socio-economic programmes and municipal service towards the formation of a prosperous, peaceful and viable society in accordance with national development objectives. • To determine existing local authority as local government units that is efficient and able to cope with the aspect of administration and finance to provide modern services of quality to the benefit and well-being of local communities managed by them. • To determine that local authority plays an active and effective role in the urban and rural development through the implementation of the infrastructure projects, business and semi-business and determine development activities in local authority level complies with requirements of the new economics from the angle of poverty eradication and restructuring of society. • To determine that local authority acts as an effective government administrative unit from the aspect of participation and involvement of local citizen in domestic affairs. • To form and to make local authority as effective authorities planner, capable and efficient in carrying out the tasks perfectly at local level following proper planning and systematic manner to control development activities in rural and urban areas through prescribed methods. • To establish and maintain cooperative relationship among central government and state government and also other government agencies in all levels relating with policy and administration of local government.	• Establishment of a viable, dynamic and sustainable local authorities in line with the Local Government Act 1976. • Issues guidelines and circulars pertaining to policies and regulations for local authorities. • Secretariat for the National Council for Local Government. • Planning and budget allocation for local authorities for the development projects including monitoring its implementation.
Solid Waste and Public Cleansing Management Corporation	**Vision** Turning Malaysia into a clean and prosperous country	• Administer and enforce the solid waste and public cleansing management laws and related matters. • Solid Waste and Public Cleansing Management Corporation Act 2007. • To advise and implement all decisions by the Government involving

Organisation	Vision and Mission	Functions
	Mission To implement the policies and strategies in solid waste management and public cleansing in an integrated and effective manner through the improvement of public awareness, usage of current technologies and the enforcement of laws to ensure a clean, safe and sustainable environment.	solid waste management and public cleansing and solid waste infrastructure projects. • To advise and ensure compliance to standards, specifications and guidelines involving solid waste management and public cleaning services to the Government. • To carry out regulation and enforcement of key performance indicators (KPI) and standards agreed upon with the concessionaires and contractors to ensure all obligations carried out meets the KPI and standards of the Government. • To increase awareness and public participation in solid waste management and public cleansing based on the 3R (Reduce, Reuse and Recycle) approach. • To use scientific experimentation, evaluation and advise in encouraging and increasing the quality of solid waste management and public cleansing. • To determine and impose fees or service charges by the Corporation.
National Solid Waste Management Department	**Vision** Provide an integrated, efficient, effective and cost effective solid waste management system. **Mission** Constantly improve the quality of solid waste management and public cleansing through drafting of law, strategy, plan of action and legislations.	• Implementation of Solid Waste Management Policy in a holistic, integrated, cost-effective and sustainable manner which places great importance on the environment, affordable technology and ensuring public health. • Coordination of development planning and monitoring the implementation of solid waste management projects. • Registeration and issuance of solid waste management licenses. • Solid Waste and Public Cleansing Management Act 2007.
Perbadanan Putrajaya	**Vision** Putrajaya will be a well-managed, vibrant and prosperous Federal Administrative Capital, that fulfils the socio-economic, recreational and spiritual needs of (its) residents, workers and visitors. **Mission** • Formulating the right policies and framework for development • Developing constructive engagement and alliances with all	• To perform all functions of a local government in Federal Territory of Putrajaya. • To promote, stimulate, facilitate and undertake commercial, infrastructure and residential development in the area. • To promote, stimulate and undertake economic and social development in the area. • To control and co-ordinate the performance of the above activities in the area.

Organisation	Vision and Mission	Functions
	stakeholders and partners • Building a high-performance, efficient and customer-friendly organization • Providing world-class public amenities and facilities • Cultivating a conducive environment for thriving commercial activities • Practicing a high degree of good governance and integrity	
Ministry of Transport	• To develop an integrated transport infrastructure network based on a supply driven approach. • To implement an efficient, modern and high-tech transport system. • To develop public and goods transport services which are seamless, safe and efficient. • To create a competitive environment in the transport industry. • To implement an efficient enforcement and regulatory function with integrity.	• Formulation, implementation and co-ordination of policies and strategies of land, air and sea transport, including development of ports, air traffic rights and research and planning on transportation services. • Domestic Shipping Licensing Board. • Participation in conventions, forums and committees at international level concerning transportation.
Ministry of Health	**Vision** A nation working together for better health **Mission** • To facilitate and support the people to • Attain fully their potential in health • Appreciate health as a valuable asset • Take individual responsibility and positive action for their health	
Ministry of Rural and Regional Development	**Vision** Forming a Progressive Society Through Consistent Rural Development **Mission** To Generate a Progressive Rural Community Through Strengthening Human Capital, Infrastructure and Competitive Economy In a Consistent Environment.	• Development of basic rural infrastructure such as rural roads and village roads. • Development of utilities such as electricity supply, water supply and social amenities. • Poverty eradication programmes and people's well being development in rural areas. • Development and modernization of villages and rural areas. • Restructuring of traditional villages.

Organisation	Vision and Mission	Functions
		• Rural economic improvement programmes. • Development of rural industries. • Development of rural ICT. • Community and human development.
District and Land Office		• Coordinate planning and implementation for district infrastructure sector. • Plan and implement the technical aspect of district office projects. • Implement and monitor finished projects for payments. • Implement and surveillance of federal, state and private projects. • Manage, provide and certify works specs and civil engineering plans • Plan and coordinate district physical development. • Involve in local government authority and town and country planning department infrastructure planning meeting. • Coordinate and surveillance of local development planning with local government authority. • Coordinate central development agencies of district level. • Monitor the implementation of federal project development in district through SPPII.

Table A4.5.3 - Summary of Existing Arrangements for Water Supply Sector

Organisation	Mission and Vision	Functions
Perbadanan Bekalan Air Pulau Pinang Sdn Bhd (PBA)	**Vision** Meeting All of Your Water Supply Needs **Mission** We will be a leading organisation in water supply	• Production and distribution of treated water to consumers within the service area. • To maintain all existing infrastructure and dams. • To design new infrastructure and upgrade operations. • To develop raw water resources based on the guidelines determined by the State Government.
Badan Kawal Selia Air Pulau Pinang (BAKSA)		**Water Asset Management** • Record list of water assets. • Coordinate the preparation of tender documents. • To coordinate the terms of agreements for tender documents. • To prepare proposals for development budgets. • To coordinate the allocation and spending of development budgets. • To prepare the proposal budgets for water supply projects under the Malaysia Plans. • To audit the allocations and spending of the budget under the Malaysia Plans. • Management and audit of other matters under water asset management.
Syarikat Air Negeri Sembilan (SAINS)	**Vision** To become the best operator through excellence, innovation and responsibility towards the community and environment. **Mission** Provision of continuous water supply that meets national standards in an economical manner.	• Production and distribution of treated water to consumers within the service area. • To maintain all existing infrastructure and dams. • To design new infrastructure and upgrade operations. • To develop raw water resources based on the guidelines determined by the State Government.
Badan Kawal Selia Air Negeri Sembilan		**Development** • Coordinate policies and regulations concerning raw water resources development. • To enforce provisions under the Water Act 1920 (Revised – 2007). • To manage the license for raw water abstraction.

Organisation	Mission and Vision	Functions
		• To control raw water source pollution. • To regulate activities within water catchments, rivers, dams, coastal areas and water intake points. • To identify water catchment areas and to propose gazettment of water catchment reserves and dam areas. • To supervise dams and water transfer schemes and to control rivers and other water bodies. • To monitor the services of Syarikat Air Negeri Sembilan. **Legislation and Enforcement** • Coordinate policies and regulations concerning raw water resources development. • To manage matter concerning amendments, drafting concerning the provisions under the Water Act 1920 (Revised – 2007). • Enforce monitoring requirements, conditions and laws concerning catchment areas, rivers, dams, coastal waters and water intake points under the Water Act 1920 (Revised – 2007). • To produce notices and to take action against any premises and companies in violation of the Water Act 1920 (Revised – 2007). • To carry out inspections and enforcement towards pollution of raw water sources. • To supervise and manage public complains. **Registration and Income** • Manage registration concerning raw water usage. • To collect income from users of raw water. • To manage all activities and process involving income and collection of income. • To assist in the process of engaging maintenance work.
Syarikat Air Melaka Berhad (SAMB)	**Vision** To be the world class water provider.	• Management of water supply to consumers and related services.

Organisation	Mission and Vision	Functions
	Mission Excellence in water management for the betterment and development of all.	
Badan Kawal Selia Air Melaka	**Vision** Towards state management as the main agency in planning, implementation and management based on professionalism, integrity and new technologies in line with the objectives of the State of Melaka to become a developed state by 2010. **Mission** Ensure water sources and the environment are in a state of protection and sustainable to support the socio-economic development of the state to be always competitive.	• To carry out regulation concerning water supplt services by the license holders including determining service standards for infrastructure, services, implementation and enforcement. • To ensure optimum supply of water at reasonable charges and to promote effectiveness in water supply. • To advise the State authorities on the supply of water and water supply services. • To encourage, improve and ensure the safe and sufficient supply of water. • To encourage and intensify the supply of water for reasons of state economic development. • To regulate and ensure that license holders can carry out the activities and regulations under the enactment. • To provide license to Syarikat Air Melaka Berhad (SAMB) until the implementation of the Water Services Act 2006.
Syarikat Air Johor Holdings Sdn Bhd	**Mission** We shall continuously satisfy our customers and stakeholders, delivering quality services to become a world class water utility provider.	• Abstraction of raw water from the catchment areas for treatment. • Distribution of treated water to domestic, commercial and institutional customers. • Collect and retain from the customers charges and fees relating to the supply of treated water for different classes of consumers. • Operations, maintenance and development of water treatment, reticulation and supporting systems.
Aliran Ihsan Resources Berhad (AIR Berhad)/ Equiventures Sdn Bhd		• Concessionaire for the supply of potable water to Johor Bahru District (under Equiventures Sdn Bhd). • Operations of water treatment plants within Johor (Northern, Southern and Central Regions) (under Southern Water Corporation Sdn Bhd). • Construction of waterworks and water treatment plants.

Organisation	Mission and Vision	Functions
Badan Kawal Selia Air Johor (BAKAJ)	**Vision** Cooperate with government departments, NGOs, corporate sector and the public to achieve a sustainable environment and good water quality. **Mission** To become a world class organization by the year 2020.	**Management Unit** • Administrative functions, human resource management, finances, legislation, customer services, agreements/ documentation, enforcement, training, licensing. **Catchment Management Unit** • Integrated management of water catchment areas. • Coordinate and implement sampling and analysis of raw water quality. • To supervise and examine the quality of water in reservoirs and rivers. • To analyse hydrological and height data for reservoirs and rivers. • Coordinate and manage research and development for catchment. • To investigate and enforce against pollution to the catchment area. • Manage and provide briefs towards environmental impact assessments. • Manage, monitor and maintain existing reservoir structures based on the "Guidelines for Operation, Maintenance and Surveillance of Dams". • Coordinate and manage integrated information management system, GIS, remote sensing for river basins and reservoirs. **Water Resource Management Unit** • To supervise the implementation of the Johor-Singapore Agreement. • To supervise the implementation of the Johor-Melaka Agreement. • Analyse hydrological data. • To implement sampling and analysis of raw water quality. • To coordinate and supervise the collection of raw water income from PUB Singapore, Melaka government, plant operators, factories and so forth/ • To supervise studies on river rehabilitation. • To investigate the source of pollution and to take action against any parties identified as polluting rivers.

Organisation	Mission and Vision	Functions
		• To manage and collect income from water sources. • To coordinate and manage education programs concerning water resource management and water quality. • To provide, update software and contents of the web site. • To keep records and documents of water supply assets and water sources. • To carry out research towards the development of water sources.
Badan Kawal Selia Air Pahang	**Vision** To ensure that the state administration remains as the foremost organization in terms if planning, implementation and management based on professionalism, integrity and current technology in line with the State of Pahang's objective to become a developed state. **Mission** To ensure that water resources and the environment are kept in a conserved and sustainable state to support the socio-economic development of the State to be continuously competitive.	• Manage, control and coordinate water resource and water quality in the State of Pahang. • Manage and control water catchment areas in an integrated manner. • Manage and issue licenses for the supply of raw water.
Jabatan Bekalan Air Pahang		• Water supply to the State of Pahang. • Maintenance of infrastructure and services. • Collection of fees and income.
Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS)	**Vision** To the leading water provider of quality. **Mission** • To deliver unrivalled water products and service to out domestic, commercial and industrial customers. • To deliver a better quality of life for all. • To continuously invest in improving our facilities and in technology to meet and exceed the highest of standards. • To ensure the preservation of our environment. • To be a customer-friendly organization that provides excellent.	• Supply of potable water to consumers. • Maintenance of infrastructure and water-related assets, replacement of aging pipes and water meters. • Collection of service fees from consumers. • Awareness promotion on water-related issues towards ensuring the standard quality of life is sustained.

Organisation	Mission and Vision	Functions
	service at all times	
Syarikat Pengeluar Air Sungai Selangor Sdn Bhd(SPLASH)		• Concessionaire to build, operate and maintain the Sg Selangor Water Supply Scheme Phase 3 (SSP3). • Operation and maintenance of the Sg Tinggi Dam. • Production and supply of bulk treated water to SYABAS.
Taliworks Corporation		• Management, operations and maintenance of water treatment facilities under Sungai Selangor Phase 1 (SSP1). • Water supply and distribution system for the whole of Langkawi, Kedah and Sg Baru water treatment plant in Perlis.
Puncak Niaga Holdings Berhad	**Vision** To be a leading regional integrated water, wastewater and environmental solutions provider and to emerge as a significant player in the oil and gas sector. **Mission** • To meet the increasing challenges in the demand for high quality water supply, wastewater and environmental systems through the continuous implementation of high quality standards, efficient services, human capital development, innovative technologies and operational systems. • To share our experience and offer our expertise through Smart Business Partnerships, Public Private Partnerships or other innovative business models. • To actively participate in local, regional and global business opportunities with linkages to the Company's core activities, waste water & solid waste management, environment management and oil & gas sectors. • To actively support and participate in programmes and activities aimed at uplifting the community's living standards and value systems in line with the aspirations of Vision 2020. • To address national and international concerns pertaining to the	• Management of 29 water treatment plants and dams servicing Selangor and Wilayah Persekutuan Kuala Lumpur. • Operates the Sg Langat, Klang Gates and Tasik Subang Dams • Provision of water services and distribution through its subsidiary of SYABAS. • Professional consultancy and research and development in the water sector.

Organisation	Mission and Vision	Functions
	protection, conservation and enhancement of the natural environment we live in.	
Air Kelantan Sdn Bhd	**Vision** To become a world class water supply provider. **Mission** To provide water supply services that are effective to the customers based on current technologies and committed and professional man power in a conducive work environment.	• Management of water supply in the State of Kelantan including water source, treatment, supply and distribution). • To provide water supply to the agreed standards and quality. • Consultancy and management of projects. • Control of non revenue water. • Planning and implementation of water supply infrastructure. • To improve and upgrade existing systems. • To collect income and fees.
Jabatan Air Negeri Kelantan	**Vision** To ensure sustainable use of the State's water resources in terms of quality and quantity. **Mission** Manage the State's water resources to ensure that it is clean and adequate for the well-being of the people.	• Gazettment and management of water catchment. • To regulate the water supply within the state through the EBA 1995 and concessionaire agreements. • To evaluate and decide on matters related to water supply charges and water tariffs. • To assist the concessionaires in carryout the tasks of effective water supply in the state. • To plan and coordinate new projects on water supply. • To take action against any complains concerning services by the concessionaires. • To issue and renew licenses for plumbers and well licenses.
Lembaga Air Perak	**Vision and Mission** To provide clean water for the needs of all, including urban and rural populations as well as for the commercial and industrial sectors.	• Water supply to the State of Perak. • Maintenance of infrastructure and services. • Collection of fees and income.
Syarikat Air Terengganu Sdn Bhd (SATUWATER)	**Vision** Towards becoming the main water supply organization in the Country. **Mission** To provide quality and adequate clean water while improving the quality of service to fulfill the satisfaction of the consumers.	• Water supply to the State of Terengganu. • Maintenance of infrastructure and services. • Collection of fees and income.

Organisation	Mission and Vision	Functions
Syarikat Air Darul Aman Sdn Bhd (SADA)	**Vision** To become the major regional clean water supply company. **Mission** • To provide clean, safe and adequate water through planning and development of complete water infrastructure, effective distribution system, effective monitoring and control of water quality, use of latest technologies and effective customer service to all domestic and commercial users. • To improve income collection through efficient fee collection, reduction of NRW, minimizing costs and diversifying income sources to increase profits for the company.	• Water supply to the State of Kedah. • Maintenance of infrastructure and services. • Collection of fees and income.
Indah Water Konsortium (IWK)	**Vision** To be the most efficient and environmental caring sewerage company. **Mission** We are highly committed to providing efficient sewerage services to all customers besides striving towards a sustainable and friendly environment.	• Provision of sewage collection and treatment services. • Construction, operation, maintenance and monitoring of sewerage related infrastructure in Peninsular Malaysia. • Refurbishment and upgrading of existing sewage treatment plants. • Integrated centralized sewage system planning and catchment management. • Certification of sewage equipment and facilities. • Research and development. • Project management consultancy.

Table A4.5.4 - Summary of Existing Arrangements for Water Resources Management in Sabah

Organisation	Mission and Vision	Functions
Sabah State Water Department	**VISION** To make Sabah Water Department financially viable by 2010. **MISSION** To provide quality treated water to consumers in Sabah under the Sabah Water Supply Enactment 2003. **OBJECTIVE** 1. To provide sufficient good quality treated water in line with the increase in population and the State social economic growth; 2. To provide good customer service including accurate and efficient billing system and revenue collection; 3. To attain a suitable percentage in providing potable water to urban and rural population; and 4. To provide water supply facilities to fulfill the people needs in districts by way of; • Accurate scheduling in revenue collection; • Complete water supply distribution; • Water supply which is adequate in quantity and satisfy the quality standards; and • Service which is efficient and customer oriented.	• Manage the production and distribution of water, and the collection of revenue; • Regulate and control the supply of water; • Ensure efficiency and quality in the supply of water; • Exercise regulatory functions as prescribed under this Enactment and the Regulations made hereunder; • Investigate any accidents involving any part of a water supply system arising out of the operations and maintenance of any water supply system or water supply services; • Require a Water Supply Authority to perform any duty imposed on him by or under this Enactment or any regulations made hereunder; • Prescribe a code of practice for Water Supply Authority; • Prosecute any offence under this Enactment; • Issue license; • Review the regulations made hereunder and to make recommendations to the Minister; and • Carry on all such other activities as may appear to the State Water Authority necessary and incidental for the purpose of carrying out or in connection with the performance of his functions and duties under this Enactment.
Ministry of Tourism, Culture and Environment, Sabah	**Vision** • Sabah, a premier eco-tourism destination; • A clean, healthy and safe environment; and • A well-conserved cultural and natural heritage	• Develop and provide a policy and guidelines for sustainable tourism development for Sabah in line with national policies. • Provide input on suitability/appropriateness of tourism development project if it involves: • application of state land, and appropriateness • private land, to ensure it is in line with state policies, legal

Organisation	Mission and Vision	Functions
	Mission • The tourism industry as the main and consistent contributor towards the state as well as the national economy; • The protection and conservation of the environment for a clean, healthy and safe living; • The conservation of natural and cultural heritage (both tangible and intangible) for posterity.	requirements, zoning, marketing and promotional efforts. • If the project is viable and developers show capacity to be able to carry out the project successfully according to state and federal policy and guidelines, the Ministry may provide appropriate letters of support and recommendations for the applicant and developers to secure the necessary financial support/loans from commercial banks.
Sabah Parks	**Vision** • Committed to even maintain the natural beauty by preserving and conserving them to be a treasure trove of natural heritage in the state of Sabah in particular and Malaysia in general. • Continuing research efforts for the important of scientific research which give benefit to the society of today and the generations to come. • To increase the amount areas of the park by gazetting areas that suitable and meet the criteria required, in addition to make strategic certificates to solve problems associated with the park. **Mission** • To protect, sustain, preserve and conserve nature areas that was gazetted as Sabah Parks areas as well as to make as one of nature heritage treasure that Malaysian especially Sabahan to be proud of. • To conduct researches which emphasize the aspects of scientific & sociocultural that has human being biosphere. • Organize and conduct educational programs to increase public awareness of the environment or society, especially areas that been gazetted as Park areas. • Try the best to make the park areas as an area that received recognition through awards such as the World Heritage Area (World Heritage Conservation). • Provide recreational areas and leisure-oriented natural beauty that is not contaminated, as well as helping the government to develop the	• To carry out functions within the Sabah Parks Enactment 1984

Organisation	Mission and Vision	Functions
	tourism industry.	
Sabah Wildlife Department	**Vision** Sabahans living in a just world that value and conserve nature. **Mission** To conserve the integrity and diversity of nature and ensure the sustainable and equitable use of the state's wildlife resources. **Objectives** 1. To conserve the flora, fauna and nature of Sabah so as to ensure the perpetuation of all species within their natural habitats. 2. To manage the State's wildlife resources for the benefit of the people of Malaysia in general and of Sabah in particular.	• **Wildlife Research** – Issuance of research permits to carry out activities for scientific or educational purposes and for the collection of specimens for animals and plants. • **Wildlife Tour Operators** – Issuance of permits for wildlife tour operators in protected areas under the authority of the department. • **Wildlife Guides** - Issuance of license for wildlife guides for the purpose of carrying out specific functions in protected area. • **Honorary Wildlife Wardens** – Appointment of suitable persons to be Honorary Wildlife Wardens to assist in carrying out effective provisions of the Wildlife Conservation Enactment or as a mark of recognition of valuable services rendered to wildlife and wildlife habitat conservation in the State. • **Wildlife Filming** – Issuance of permits to carry out commercial filming, still photography, video or sound recording relating to wildlife or the habitats in protected areas under the authority of the department. • **Hunting Licenses** – Issuance of hunting or collection licenses under the department. • **Wildlife Farming** – Issuance of permit to carry out business of breeding, rearing or keeping wildlife species for sale, slaughtering, preserving or otherwise processing of slaughtered animals, sale of meat and animal products or display in public in return for payments or rewards. • **Wildlife Trade** - The department may allow a person to sell live protected animal or product of a protected animal if the following rules are followed: a. holding a certificate of ownership in respect to that animal or animals product; b. holding an animal dealer's permit issued by the department; c. holding an animal farming permit issued by the department; d. where the person has captured or killed the animal under the

Organisation	Mission and Vision	Functions
		authority of a commercial hunting license and sells the animal or animal product therefrom to a person having an animal dealer's permit or animal farming permit; e. where a member of a kampung sells an animal product of a protected animal obtained pursuant to an animal kampung license to a person f. holding an animal dealer's permit or sell such animal product to another member of the kampung in that kampung market. • **Wildlife International Trades** – Control of movement of protected animals/ plants into or out of the State. • **Zoo and Botanical** – Issuance of permit for private zoological garden for the right to keep animals. • **Protection of land and property and self defense** - assistance to an owner of land to control any protected animal presence in the vicinity of his land that is likely to endanger life or property.
Environment Protection Department	**Vision** To transform the Environment Protection Department into an organisation that excels in environmental management. **Mission** To protect the environment so that it is clean, healthy and safe for quality living. **Objectives** • Integrate environmental factors into the planning and implementation of development activities and exploitation of natural resources; • Regulate development activities and the exploitation of natural resources that cause environmental pollution and degradation or have the potential to cause significant residual impact on the environment; • Protect sensitive areas for the maintenance of environmental quality and stability, and	• Environmental planning • Environmental screening on proposed development activities • Environmental assessment • Environmental monitoring and enforcement • Environmental development projects • Environmental information management • Environmental extension and awareness • Environmental advisory

Organisation	Mission and Vision	Functions
	• Enhance public awareness on the importance of environmental protection and conservation.	
Kementerian Pembangunan Infrastruktur	**Vision** Towards achieving sustainable infrastructure development in line with the needs and vision of the State of Sabah **Mission** • To implement and complete all projects allocated according to specifications within the allocated timeframe with fair costs. • To provide qualified man power with the professionalism, skills and ability in all tasks that ahs been entrusted within the projects. • To provide infrastructure and public facilities that are appropriate and to meet the existing needs. • To summarise, plan and implement infrastructure and public facilities involving roads, water supply, buildings, rail transportation, ports and oil rigs to fulfill the needs of social and economical development of the state especially for the rural areas while maintaining, improving the quality of existing infrastructures and public facilities.	• Provision of road systems that are efficient and safe for use, in urban and rural areas for the development of industry, agriculture, forestry and tourism. • Provision and maintenance of rail services as a step towards achieving socio-economic objectives. • Provision, development and upgrading of port facilities. • Provision of clean and adequate water supply to urban areas. • Hasten the provision of water supply to rural areas. • Encourage the private sector to participate in the provision of water supply to the rural areas. • Provision of drainage systems in urban areas and ensure there are systematic maintenance towards the sewage treatment facilities until taken over by the local authorities. • To administer and coordinate activities and functions of the department and all agencies below it.
Department of Irrigation and Drainage Sabah	**Vision** Towards excellence in the planning, development and management of water resources for sustainable agricultural and socio-economic growth in line with the national vision. **Mission** To provide quality, efficient and effective services in the fields of irrigation, drainage, river engineering and coastal engineering through sustainable development and integrated management of the Sabah state's water resources.	• Irrigation: provide irrigation facilities and infrastructures for cultivation of padi and other crops. • Agriculture drainage: To plan and design drainage facilities and infrastructures to support the development of tree crops and commercial crops. • River engineering: To carry out flood mitigation works in rural and urban areas to alleviate flooding through maintenance and reformation of rivers such as dredging, diversion and river training. • Coastal engineering: To undertake studies and to implement works on coastal erosion and river mouth siltation and to carry out the collection of coastal engineering data. • Urban drainage: To carry out master plan studies as well as planning, design, implementation and management of urban drainage works to

Organisation	Mission and Vision	Functions
		overcome flooding and drainage problems in urban areas. • Water resources management: To manage and regulate the state's water resources. • Supporting services: To provide professional civil engineering support services to departments and agencies under the Ministry of Agriculture Development and Food Industry.

Table A4.5.5 - Summary of Existing Arrangements for Water Resources Management in Sarawak

Organisation	Mission and Vision	Functions
Sarawak State Planning Unit		• To formulate the State socio-economic development policies and priorities at the macro, sectoral and regional level, especially in the formulation and review of the State Five Years Development Plan inline with the national development agenda, and thus to formulate allocation distribution based on such policies and priorities through close cooperation with the State ministries and agencies (especially with the State Financial Office). • To advice the Government of Sarawak (GOS) on macro, sectoral and regional socio-economic issues especially in the area of economic growth and distribution. • To develop, manage, analyze and disseminate the State macro, sectoral and regional database (inclusive the digital spatial information) which are relevant to the State socio-economic and resource development and management. • To initiate, manage, and coordinate the master plan and feasibility studies, and socio-economic programs/projects impact assessment and thereafter to present the Studies findings and proposals for GOS (and GOM) consideration and accordingly undertake all the necessary follow-up actions. • To coordinate all Socio-economic Research and to source and manage Foreign Technical Assistance (TA). • To serve as secretariat to various planning council/committees at the

Organisation	Mission and Vision	Functions
		State level.
Ministry of Environment and Public Health		**Policy making and advisory** • Identify and create policies relevant to the needs of the current time in fulfilling the Ministry's roles and objectives. • Advise the Government on issues related to environment and local authorities. **Development planning and monitoring** • Bid, plan and monitor development projects implemented through the Ministry and its agencies and report to the State and Federal Governments. **Regulatory Monitoring** • Uphold and review where necessary, the rules, regulations and ordinances governing the functions of the Ministries and its agendies • Monitor the enforcement of rules, regulations and ordinances relating to environment and local authorities. **Provision of services to target groups** • Provide services to support the delivery of local authorities services to the public.
Ministry of Land Development	**Vision** To be the leader in the development of the oil palm industry in the State in order to transform Sarawak into the Oil Palm State of Malaysia. **Mission** To provide efficient and effective leadership in the monitoring of oil palm plantation development on both NCR Land and State Land and to provide policy direction on the development of NCR Land into commercial oil palm plantations in order to create employment opportunities in the rural areas, safeguard the interest of both the landowners and investors in their efforts to optimize returns from the oil plantation development. We are also committed to preserve the environment towards achieving sustainable socio-economic development.	• Formulate policy, plan and monitor land development programme in the state. • Monitor poverty eradication programmes. • Plan and monitor development of plantations and agriculture estates undertaken by the Sarawak Land Development Board. • Plan, monitor and coordinate development of land held under native customary rights. • Provision and management of drainage and irrigation systems plan for agricultural projects, coordinate and monitor development of peat soil regions and wetland in the state. • Keep a watching brief over the operations of FELCRA Berhad and FELDA Berhad in the State.

Organisation	Mission and Vision	Functions
Ministry of Public Utilities Sarawak	**Vision** To be the lead authority that provides the strategic direction and policy thrust for utilities sector development in Sarawak. **Mission** • To develop and formulate innovative policies in the State. • To strive for adequate, reliable, quality, efficient, affordable and safe water, energy, telecommunication infrustructure and gas for industrial, commercial and domestic users in the State. • To adopt environmentally friendly approach and initiative in the utilities sector in the State.	**Water Supply** • To ensure an adequate, reliable, quality, efficient, affordable and safe supply of treated water to meet the growing demands in urban areas. • To plan for adequate capacity for the ever increasing demand in utility sectors from domestic, commercial and industrial consumers or users. • To ensure projects are implemented according to policy, schedule, budget and approved scheme values. • Administration and enforcement of water ordinance, water supply regulations and licensing provisions in the State. • Development and management of existing water resources • Planning, coordinating and monitoring of water supply development projects in Sarawak. • Planning, formulation and implementation of policies on water supply sector in Sarawak. • To extend the supply coverage of treated water to rural areas especially to kampungs and longhouses throughout Sarawak. **Rural water supply and rural electrification scheme** Planning, coordination and monitoring the rural electricity and rural water supply development projects in Sarawak.
Kuching Water Board	**Vision** To be a dedicated and dynamic water supply agency with culture and values that are excellence driven and performance oriented which consistently provides services that meet full consumer satisfaction. **Mission** To provide adequate and reliable, quality potable water supply at acceptable charges to all consumers within its area of jurisdiction at the highest attainable standards in quality and service.	• Administration, management and supervision of all waterworks situated within its area of supply and to ensure adequate production and supply of quality treated water to consumers within its supply area and to meet increasing demand brought about by development and growth in the area.
LAKU Management	**Vision** To be a caring, responsive and progressive Water Specialist.	• Concession agreement with the State Government for the production, distribution of potable water and collection of water revenue in the 3

Organisation	Mission and Vision	Functions
Sdn Bhd	**Mission** • Providing safe, reliable and affordable water with quality service. • Diversifying and widening the business and service prospects. • Continually improving the efficiency and effectiveness.	northern urban townships of Miri, Bintulu and Limbang in Sarawak.
Sibu Water Board	**Vision** Towards world class provision of potable water for the central region of Sarawak. **Mission** The provision of safe, reliable and competitively priced water supply at the highest attainable standards in quality and service.	• Custody, management and administration of water works and the water therein and the management of supply and distribution of such water within its area of supply subject to the general control and supervision of the State Water Authority. • To supply water to consumers within the limits of its area of supply subject to the provision of the Water Ordinance 1994 and any regulations made there under.
Ministry of Tourism and Heritage	**Vision** Leading a vibrant and sustainable tourism industry. **Mission** • To develop and promote through partnership, best practices and sustainable utilisation of natural and cultural resources thereby increasing tourism benefits from global tourism networks. • To preserve and share Sarawak's unique heritage as a tourism product.	
Ministry of Housing and Urban Development	**Vision** A premier organisation in achieving sustainable housing and urban development for the people. **Mission** To serve the people. To strive to enhance the urban environment and quality of life through development and improvement of housing, urban infrastructures, facilities and services.	• To monitor and control the private housing developer. • To plan the development of public housing estate implement by Housing Development Corporation, Sarawak. • To co-ordinate public housing activities. • To plan and establish Service System, Infrastructure and Amenity Services at the Urban. • To formulate government policies relating housing and urban development.
Sewerage Services	**Vision** Sustainably managed water resources for our State.	• To plan, design and establish public sewerage systems. • To appoint a management agency to manage, operate and maintain

Organisation	Mission and Vision	Functions
Department of Sarawak	**Mission** To protect our State's water resources against pollution from domestic wastewater. **Objectives** • To provide efficient centralised public sewerage systems. • To provide efficient isolated sewage treatment facilities. • To ensure private wastewater systems are regulated and monitored. • To improve the sewage treatment efficiency through research and development.	any public sewerage system or to provide sewerage services. • To supervise, monitor and provide direction for the performance and activities of any management agency. • To issue guidelines for design standards and specifications of septic tanks, private and public sewerage systems. • To regulate the process for treatment and disposal of sewage and sewage sludge and its by-products. • To fix fees and other charges for sewerage services provided by a management agency and the payment or recovery of such fees or charges. • To exercise such powers and to perform such functions and duties conferred by the Ordinance or as the Majlis Mesyuarat Kerajaan Negeri may from time to time, by Order in the Gazzette.

Ministry of Infrastructure Development and Communication	**VISION**
	To be the prime mover in infrastructure development and communications in Sarawak.
	
	MISSION
	To plan, develop and provide infrastructure facilities with full commitment and effectiveness in line with the policies and the economic and social development needs of the state government.
		• Formulation of infrastructure development and communication policies.
		• Planning and co-ordinating the implementation of infrastructure development projects and communication facilities.
		• Co-ordination of ferry services.
		• Co-ordination of the activities of Agencies under MIDCom such as:
		  • Public Works Department
		  • Brooke Dockyard and Engineering Works Corporation
		  • Kuching Port Authority
		  • Rajang Port Authority
		  • Miri Port Authority
		  • Sarawak Rivers Board
		  • Buoys and Lights Board
		  • Watching brief for the development of the following infrastructure and communication facilities under the Federal Government:
		  - Land, Sea and Air Transportation
		  - Airports and Airfields
		• Liaising with Federal Ministries and agencies on matters affecting

Organisation	Mission and Vision	Functions

		Infrastructure Development and Communication facilities in Sarawak.
		• Co-ordinates activities of the Road Safety Council (RSC), Brunei, Indonesia, Malaysia and Philippines - East Asean Growth Area (BIMP-EAGA) and Socio-Economic Exchange for Malaysia-Indonesia (SOSEK-MALINDO).
		• Management of State Trust Funds
		  • The Infrastructure Development Trust Funds and
		  • The Sungai Sarawak Barrage Fund.

Public Works Department of Sarawak	**Vision**
	To provide the public with good infrastructure.
	
	Mission
	Leading agency for infrastructure development in the State.
		• Human Resource Management Branch.
		• Building Branch.
		• Water Supply Branch
		  • Manage and operating all 88 gazetted JKR water supply authorities in accordance with the requirement of the Water Ordinance 1994.
		  • Formulating and coordinating programme in the planning, design and construction of water supply schemes for the provision of adequate quantities of safe and wholesome water for domestic, commercial, industrial and other uses, all in accordance with the aims and objectives of the development plan.
		  • Collecting revenues from water sales.
		  • Formulating and implementing multifaceted training programme for its staff.
		  • Testing and licensing of pipe-fitters and mains layers
		  • Establishing and upholding water supply standards and criteria, with the aim to promote and advance the good practice and design of all water supply works.
		• Geotechnical and Structural Engineering Branch
		• Defence and Home Affairs (DHA) Branch
		• Mechanical Branch
		• Electrical Branch

Organisation	Mission and Vision	Functions
		• Road Branch • Account Branch • Quantity Surveying Branch • Store Branch • Technical Management Branch
Sarawak River Board	**Vision** • **Safe** - Ensuring the safety of riverine traffic in order to promote the development of a safe and efficient inland water transport system which can contribute to a balanced environomic and social development of Sarawak. • **Clean** - Ensuring the rivers remain clean and free from pollution by any means for domestic, commercial and recreational purposes. • **Natural** - Ensuring the rivers remain in their natural state as our common heritage, free from man-made structures and obstructions, for the benefit of the present and future generations. **Mission** **Sustainable Development** - There should be a balanced development to meet the expectations of the society. The development of inland water transport which can fuel the economic growth of the state should not produce detrimental impact to the environment which is crucial to sustain rivers for the well being of the present and future generations. **Quality Services** - As society progresses and becomes more affluent, their needs for quality services become more demanding. The Sarawak Rivers Board, being a service-oriented agency therefore needs to position itself to provide the quality services. **Optimum** - Rivers are natural assets, a gift from nature, which require little or no maintenance. Therefore, by adopting sustainable development through quality services in managing these natural assets, the use of the	• To plan and make recommendations to the State Government for the development and improvement of riverine transport system within the State. • Control and regulate traffic by water in ports and harbours or on rivers and in the foreshore within the limits of Sarawak. • To take all lawful, necessary and reasonable practicable measures to keep river or port clean and free from filth, rubbish or refuse. • To take all appropriate measures to prevent or reduce rate of erosion of the banks of rivers and for the protection and restoration. • To examine, study and determine the utility and practicability of improving the navigability of all rivers as against the encroachment of debris and other refuse from industrial factories operating along the river. • To provide buoys, moorings and lights including other aids to navigation for the guidance of vessels in the rivers. • To provide facilities such as wharves, jetties or other passenger landing terminals and maintenance thereof. • To prevent the obstruction of any river or watercourse. • To make recommendations for the safety of vessels plying in the river and the prevention of collisions. • To operate and maintain any barrage or shiplock and to control and regulate the passage of vessels through such barrage and shiplock. • To manage and maintain any wharf, jetty or passenger landing terminal, on behalf of the government, or any other person, body corporate or authority, upon such terms and conditions as may be agreed between the Board and the owner.

Organisation	Mission and Vision	Functions
	rivers for domestic, commercial and recreational purposes could be exploited to the optimum level.	• To carry out such duties as the Majlis Mesyuarat Kerajaan Negeri may require.
Ministry of Industrial Development, Sarawak	**Vision** To be the lead government agency in accelerating high growth rate of the manufacturing sector in the state. **Mission** Our primary role is to spearhead the promotion and orderly development of the manufacturing sector in the State. In our endeavours, we will: • Promote Sarawak as an attractive and viable investment location. • Facilitate and expedite the approval of manufacturing project proposal. • Provide excellent infrastructure and facilities at reasonable cost. • Develop more SMIs and Bumiputera entrepreneur. • Provide quality services through our highly committed staff and efficient delivery systems.	• Formulate policies, strategies and programme on industrial development. • Undertake investment promotion locally and abroad. • Plan, develop and manage industrial estates. • Process and evaluate applications for industrial lots in industrial estates developed by MID. • Act as Secretariat to the Industrial Coordination Committee. • Act as Secretariat to the State Industrial Coordination Committee. • Act as watching briefs on matters relating to the MITI and MDTCA.
Ministry of Modernisation of Agriculture	**Vision** To be a pre-eminent and competent Ministry to lead the agriculture sectors that is competitive, modern and sustainable. **Mission** The Ministry is committed to the development of a globally competitive, modern and sustainable agriculture through the provision of appropriate policy, legislation, information and services for the betterment of producers, processors, marketers, consumers and economy.	• To formulate policies and development programmes that will enable agri-food industry to be globally competitive, modern and sustainable. • To monitor and evaluate the implementation of policies and programmes carried out by the agencies under its purview. • To review and modify the policies and programmes when necessary. • To formulate and review the existing legislation with the view to enhance conducive agricultural development. • To initiate or undertake research purposes if necessary. • To exercise smart partnership with other agricultural agencies so that their programmes and activities are in harmony with the Ministry's policies.
Ministry of Planning and Resource	**Vision** To become a ministry that is prestigious in planning and management of natural resources for long-term development.	• Policy issues in the field of forestry, land development, mining, quarrying and urban planning. • Provide laws to ensure the smooth implementation of government

Organisation	Mission and Vision	Functions
Management	**Mission** To transform the services of the ministry through a high prestige team.	policy. • Secretary to the various committees in implementing and monitoring the implementation of relevant government policies (Jabatan Tanah dan Survei, Jabatan Hutan, Perbadanan Kemajuan Perusahaan Kayu Sarawak, Lembaga Lindungan dan Kemajuan Tanah, Sarawak Biodiversity Centre, Sarawak Forestry Corporation).
Forestry Department of Sarawak	**Vision** To be recognised as the agency of excellence in sustainable management of tropical forest. **Mission** To sustainably manage and develop the forest resources and optimise their contributions to the socio-economic development of the nation.	• To constitute areas of forest as Forest Reserves, Protected Forest, Communal Forest, National Park, Nature Reserves and Wildlife Sanctuar. • To impose and collect royalties, premia, fees and other payments due to the Government. • To issue licences and permits under the Forests Ordinance (Cap. 126), National Parks & Nature Reserves Ordinance (1998) and Wildlife Protection Ordinance (1998). • To regulate production and export of logs from Sarawak. • To renew licenses. • To compound offences under the Forests Ordinance (Cap. 126), National Parks & Nature Reserves Ordinance (1998) and Wildlife Protection Ordinance (1998);
Natural Resources and Environment Board Sarawak	**Vision** Towards integrated environmental quality management leading to sustainable development in Sarawak. **Mission** As the lead agency to protect and manage the environmental quality and natural resources in Sarawak through the promotion of the principles of sustainable development in consonant with the National and State's vision.	• To determine the mode and manner whereby the exploitation and utilization of the natural resources in the State will not damage, pollute or cause adverse impact to the environment; • To determine and take necessary measures, including the issue of directive or order to any Environmental Authority or any other person to prevent, abate or stop the pollution of waters in the rivers or in water catchments areas; • To control, stop, or prohibit the destruction of vegetation for the protection of natural resources, rivers and other environmental elements; • To liaise with and make representation to the National Environmental Council or relevant Ministry at the Federal level to determine the

Organisation	Mission and Vision	Functions
		standards for control of environment and the enforcement of relevant rules; • To provide rules, guidelines and directions for the protection and enhancement of environment relating to land use, protection of sources of water supply, exploitation of aquatic life & plants in rivers and foreshores, and any other matters over which State exercise legislative authority or powers; • To provide information and education to the public regarding the protection and enhancement of the environment; and • To direct any Environmental Authority or any person to undertake environmental monitoring and auditing of any prescribed activities.
Ministry of Rural Development	**Vision** To be at the forefront of planning and development of rural areas into a modern, progressive and modern. **Mission** Human resource development, socio-economic development, infrastructure and amenities development, sustainable development.	
Ministry of Social Development and Urbanisation	**Vision** As the main ministry towards the formation of a caring, progressive, healthy, patriotic, self-assured, harmonious, cultured and peaceful society. **Mission** To draft and assess the policies/ programmes through studies/ research and observation of current social and urbanisation issues. Continuously improve the quality of delivery of programmes, activities, services and amenities towards social development.	
Department of Irrigation and Drainage Sarawak	**Vision** To be a world class organisation by the year 2020.	**Agriculture and land development** • Agricultural drainage and irrigation schemes • Rural growth centres

Organisation	Mission and Vision	Functions
	Mission To provide excellent services in the field of irrigation, drainage, river, coastal, hydrology and water resources development and management which will contribute towards the improvement of quality of life of the peole and the environment. **Objectives** To provide engineering services which are beyond the capability of the target group itself and subsequently to ensure optimum land utilisation and more efficient management of the state's resources.	• Peat swamp development • Granary areas **Flood mitigation and urban drainage** • Stormwater management/ Urban drainage/ Flood mitigation • Wastewater management • Integrated waste management for Kuching **River engineering** **Coastal engineering** • Integrated coastal zone management • Coastal erosion • Coastal erosion protection projects **Hydrology** • Water resources management • Sarawak weather news • Weather satellite images

Annex 4.6 - Current State and Federal Territories Institutional Organisational Structures For Water Sector In Malaysia

ANNEX 4.6 - CURRENT STATE AND FEDERAL TERRITORIES INSTITUTIONAL ORGANISATIONAL STRUCTURES FOR WATER SECTOR IN MALAYSIA

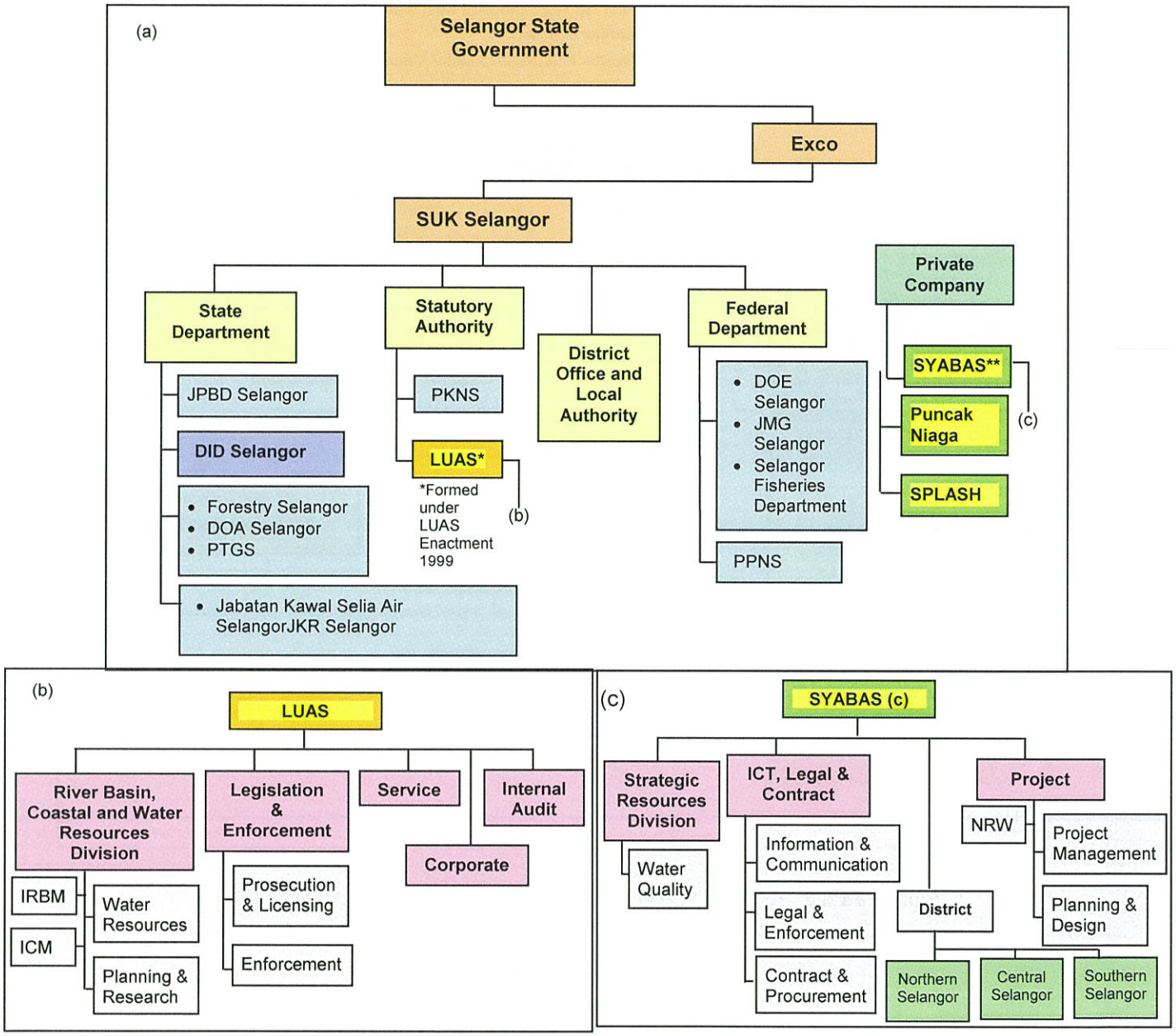


Figure A4.6.1 - Current Water Sector Arrangement in the State of Selangor

Source: Adapted from www.selangor.gov.my, www.luas.gov.my, www.syabas.com, accessed on 11 October 2010.

Notes:

- SUK – State Secretary
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- DID – Department of Irrigation and Drainage
- DOA – Department of Agriculture
- PTGS – Pejabat Tanah dan Galian Negeri Selangor (Land and Mines Office)
- JKR – Jabatan Kerja Raya (Public Works Department)
- LUAS* – Lembaga Urus Air Selangor (Selangor Water Resources Board) forms under LUAS Enactment 1999
- PKNS – Perbadanan Kemajuan Negeri Selangor (Selangor Development Corporation)

- DOE – Department of Environment
- JMG – Jabatan Mineral dan Geosains (Mineral and Geoscience Department)
- PPNS – Pejabat Pembangunan Negeri Selangor (Selangor Development Office)
- SYABAS** – Syarikat Bekalan Air Selangor Sdn Bhd (Selangor Water Supply Company) – certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006
- SPLASH – Syarikat Pengeluar Air Sungai Selangor Sdn Bhd

IRBM – Integrated River Basin Management; ICM – Integrated Coastal Management; NRW – Non Revenue Water

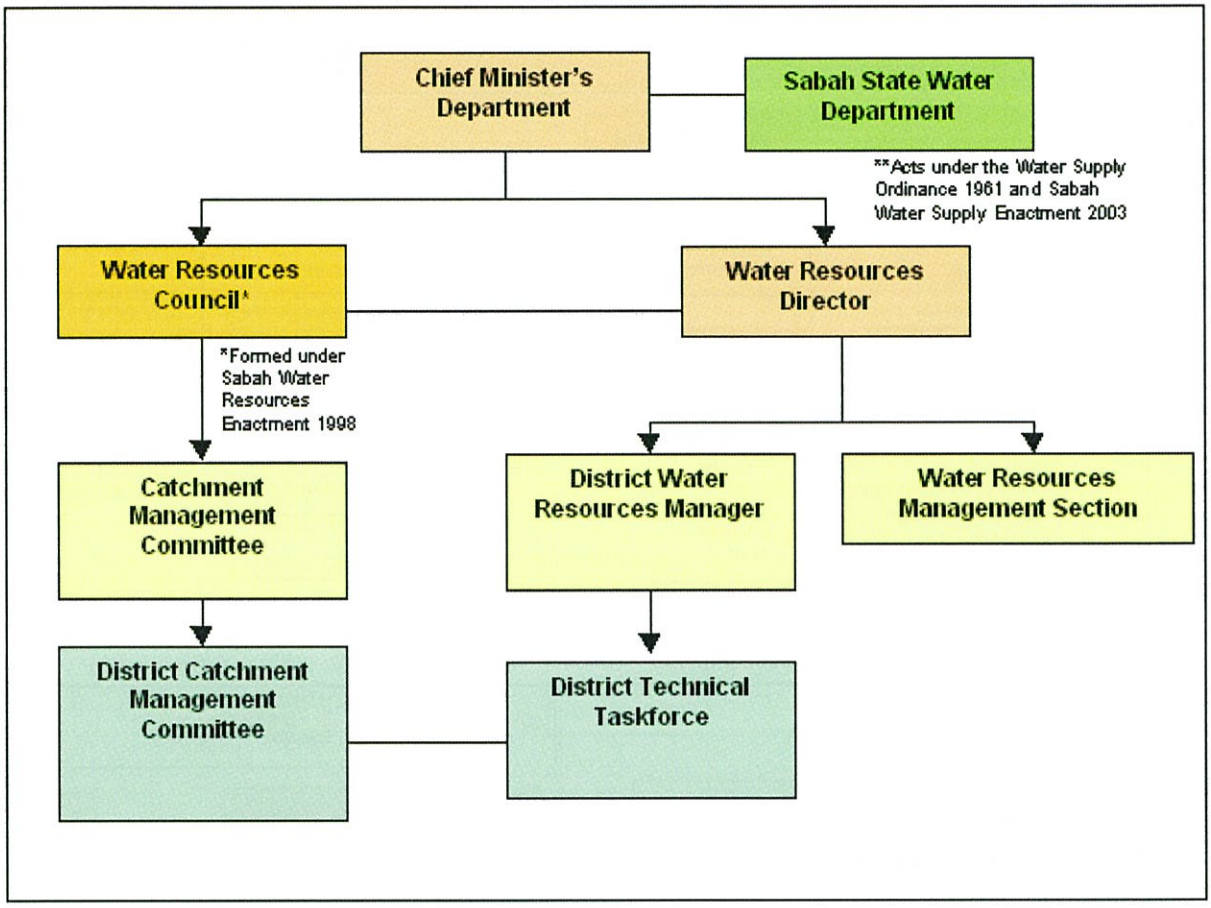


Figure A4.6.2 - Current Water Sector Arrangement in the State of Sabah

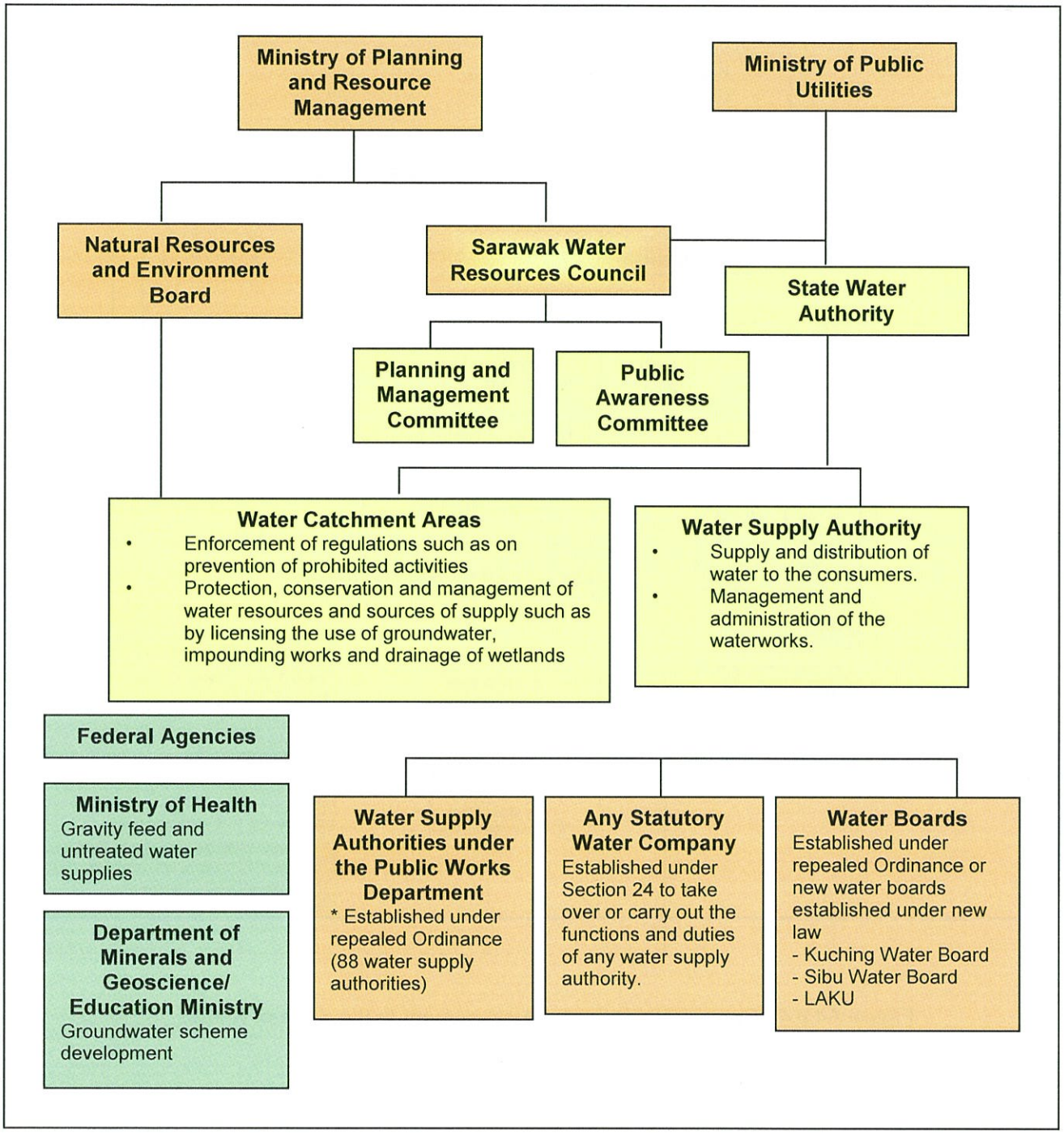


Figure A4.6.3- Current Water Sector Arrangement in the State of Sarawak

Source: Adapted from www.sarawak.gov.my, www.did.sarawak.gov.my accessed on 11 October 2010; and The Sarawak Integrated Water Resources Management Master Plan Study, 2009.

Note: DID – Department of Irrigation and Drainage

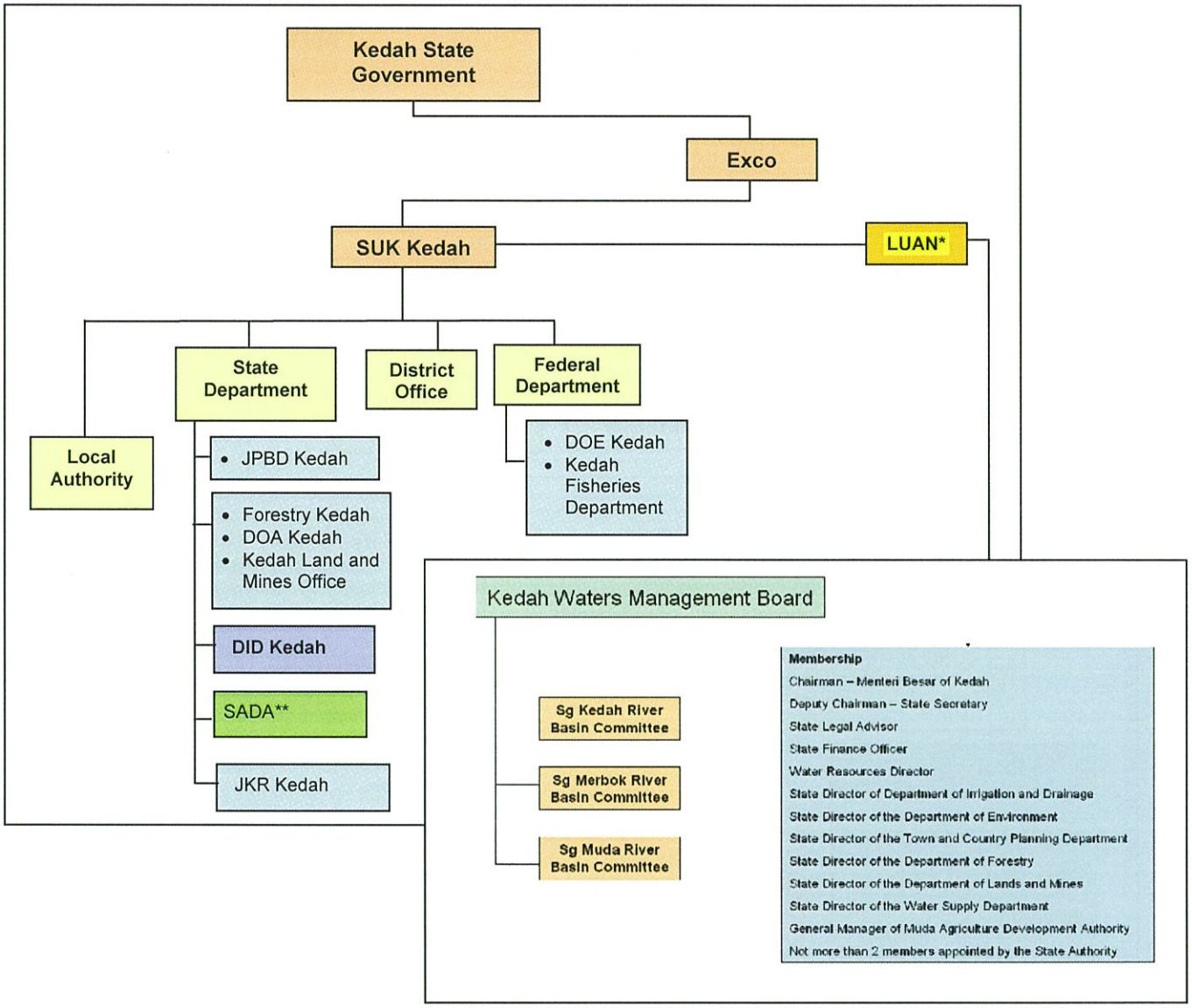


Figure A4.6.4 - Current Water Sector Arrangement in the State of Kedah

Source: Adapted from www.kedah.gov.my, accessed on 11 October 2010.

Notes:

- SUK – State Secretary
- SPA - Suruhanjaya Perkhimatan Awam (Public Services Commission)
- LUAN* – Lembaga Urus Air Kedah (Kedah Water Resources Board)* forms under Kedah Water Resources Enactment 2007 Part II 4(1)
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- DOA – Department of Agriculture
- DID – Department of Irrigation and Drainage
- SADA** – Syarikat Air Darul Aman – certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006
- JKR – Jabatan Kerja Raya (Public Works Department)
- DOE – Department of Environment

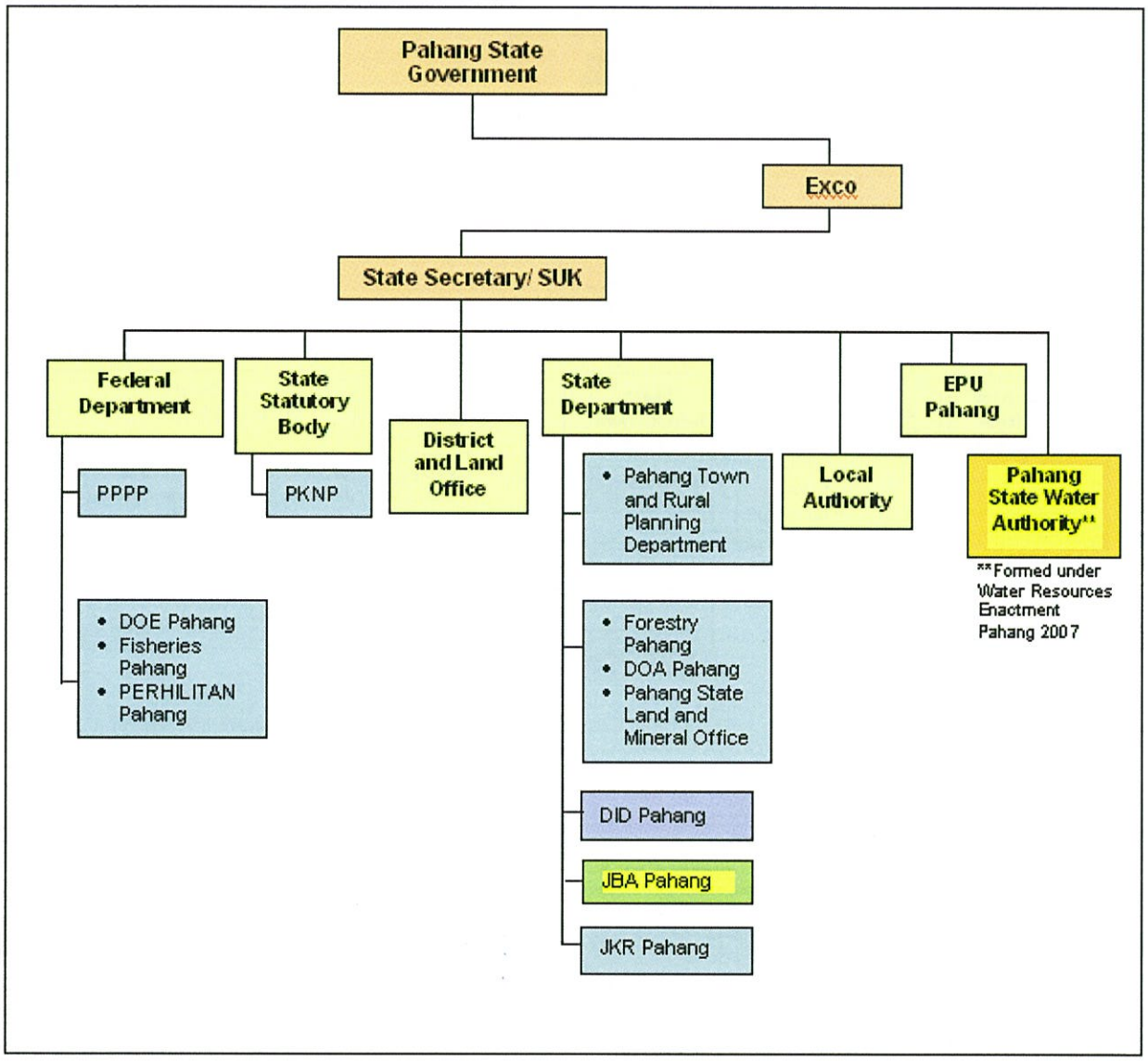


Figure A4.6.5 - Current Water Sector Arrangement in the State of Pahang

Source: Adapted from www.pahang.gov.my

Notes:

- PPPP - Pejabat Pembangunan Persekutuan Negeri Pahang (Pahang Federal Development Office)
- DOE – Department of Environment
- PERHILITAN – Jabatan Perlindungan Hidupan Liar dan Taman Negara (Department of Wildlife and National Parks)
- PKNP – Pejabat Kemajuan Negeri Pahang (Pahang Development Office)
- DOA – Department of Agriculture
- DID – Department of Irrigation and Drainage
- JBA Pahang – Jabatan Bekalan Air Pahang (Pahang Water Supply Department) certified as water supply operator appointed by SPAN
- JKR – Jabatan Kerja Raya (Public Works Department)
- Pahang State Water Regulatory Body** - Formed under Water Resources Enactment Pahang 2007

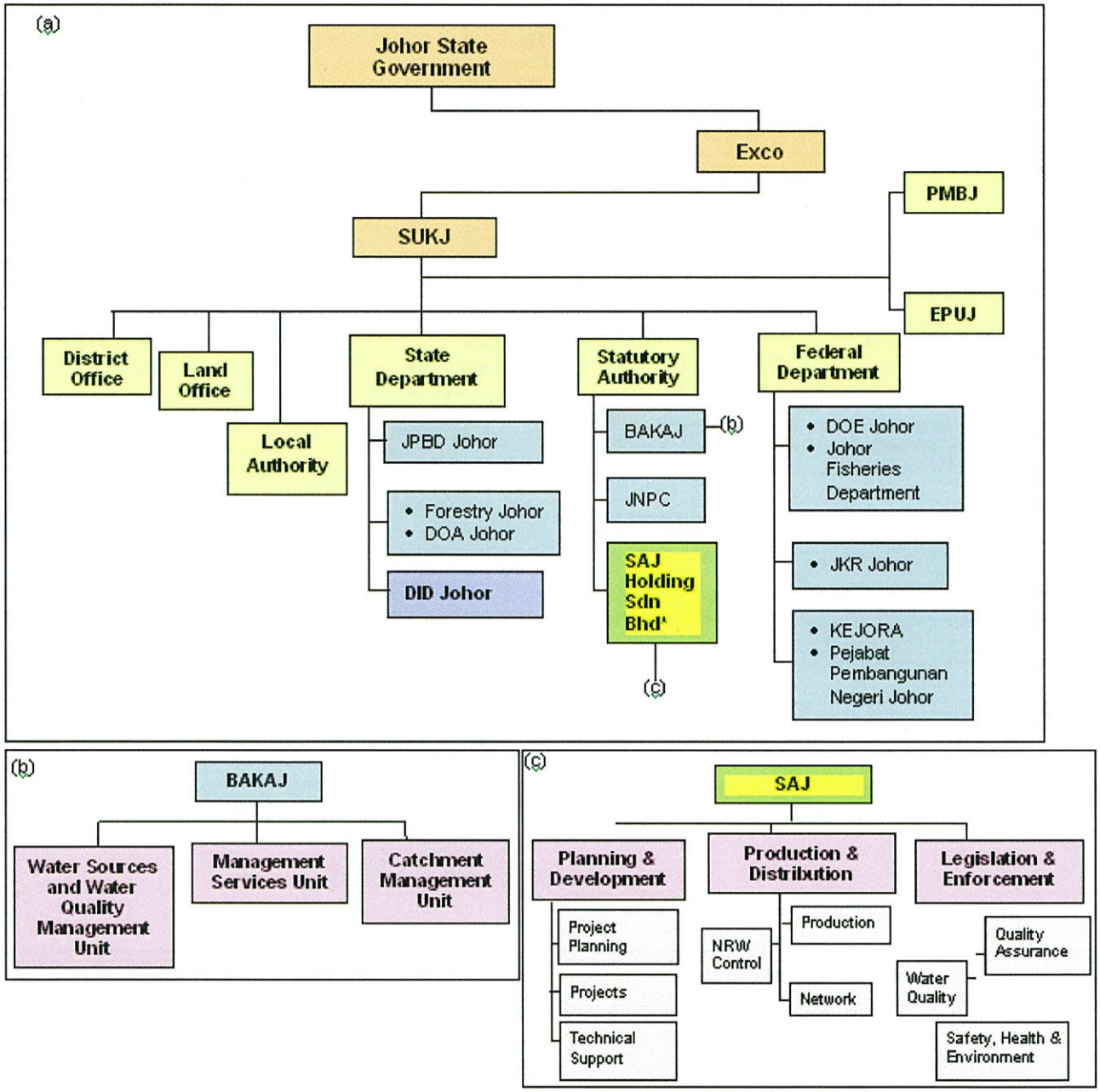


Figure A4.6.6 - Current Water Sector Arrangement in the State of Johor

Source: Adapted from www.johordt.my, www.saj.com.my, accessed on 11 October 2010.

Notes:

- SUKJ – Johor State Secretary
- PMBJ – Pejabat Menteri Besar Johor (Chief Minister Johor Office)
- EPUJ – Economic Planning Unit Johor
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- DOA – Department of Agriculture
- DID – Department of Irrigation and Drainage
- IWK – Indah Water Konsortium Sdn Bhd
- BAKAJ – Badan Kawal Selia Air Johor (Johor Water Regulator Body)
- JNPC – Johor National Parks Corporation
- SAJ Holding Sdn Bhd* – Syarikat Air Johor (Johor Water Company) – certified as water supply operator appointed by SPAN
  DOE – Department of Environment

- JKR – Jabatan Kerja Raya (Public Works Department)
- KEJORA – Lembaga Kemajuan Johor Tenggara (Johor Tenggara Development Authority)

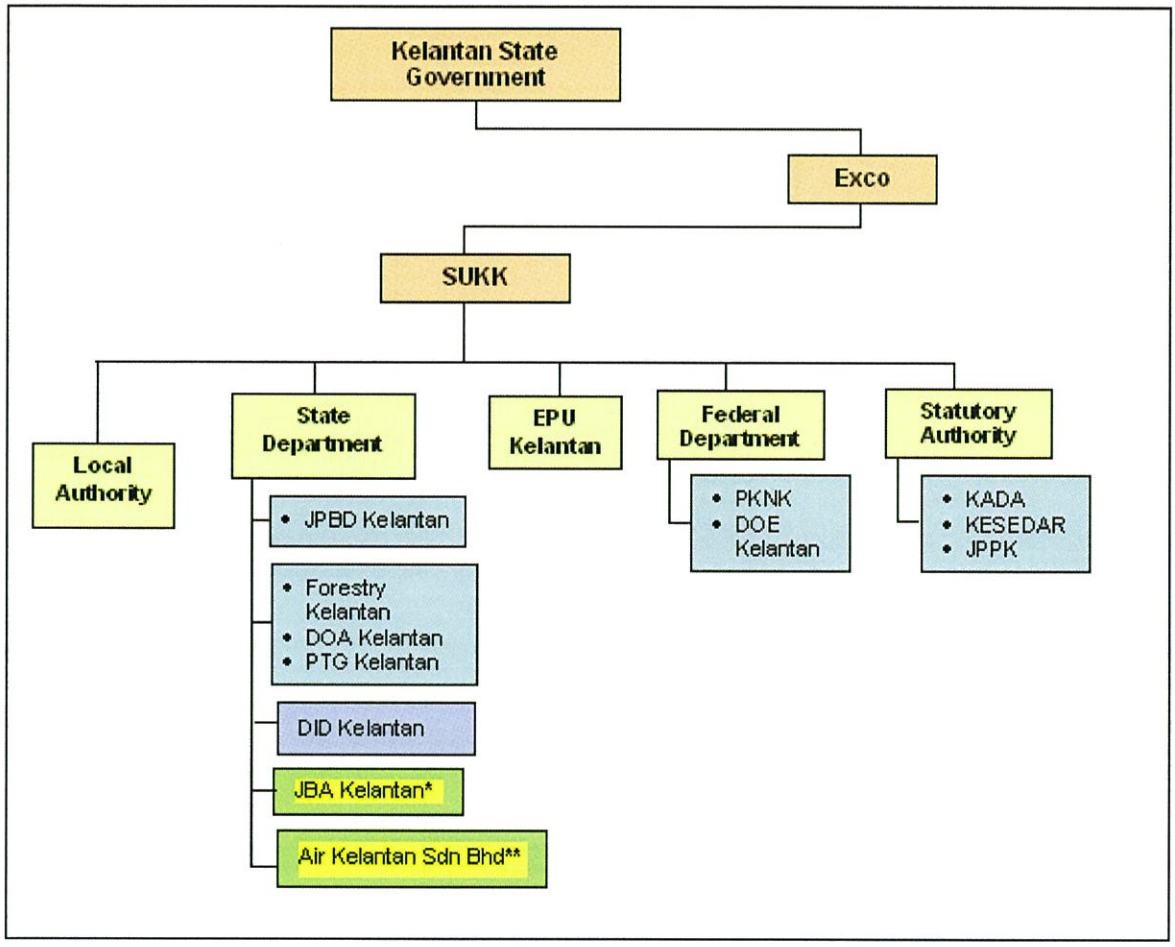


Figure A4.6.7 - Current Water Sector Arrangement in the State of Kelantan

Source: Adapted from www.kelantan.gov.my, www.airkelantan.gov.my, accessed on 11 October 2010.

Notes:

- SUK – State Secretary
- EPU – Economic Planning Unit
- JPBD – Jabatan Perancangan Bandar dan Desa
- DOA – Department of Agriculture
- PTG – Pejabat Tanah dan Galian Negeri Kelantan (Kelantan Land and Mines Office)
- DID – Department of Irrigation and Drainage
- JBA Kelantan* – Jabatan Bekalan Air Kelantan (Water Supply Department of Kelantan) – formed under Water Supply Enactment 1995. In accordance to Water Services Industry Act (WSIA) 2006, water supply regulator was taken over by SPAN, after the acquisition, currently the department serves as regulator of water sources which include catchment areas, wells and other sources of raw water and still control the water supply projects under 9th Malaysia Plan
- Air Kelantan Sdn Bhd** - certified agency as water supply operator appointed by SPAN under WSIA 2006
- EPU – Economic Planning Unit
- PKNK – Perbadanan Kamajuan Negeri Kelantan (Kelantan Development Corporation)
- DOE – Department of Environment
- KADA – Kemubu Agricultural Development Authority
- KESEDAR – Lembaga Kemajuan Kelantan Selatan (South Kelantan Development Board)
- JPPK – Jabatan Pembangunan Persekutuan Kelantan (Kelantan Federal Development Department)

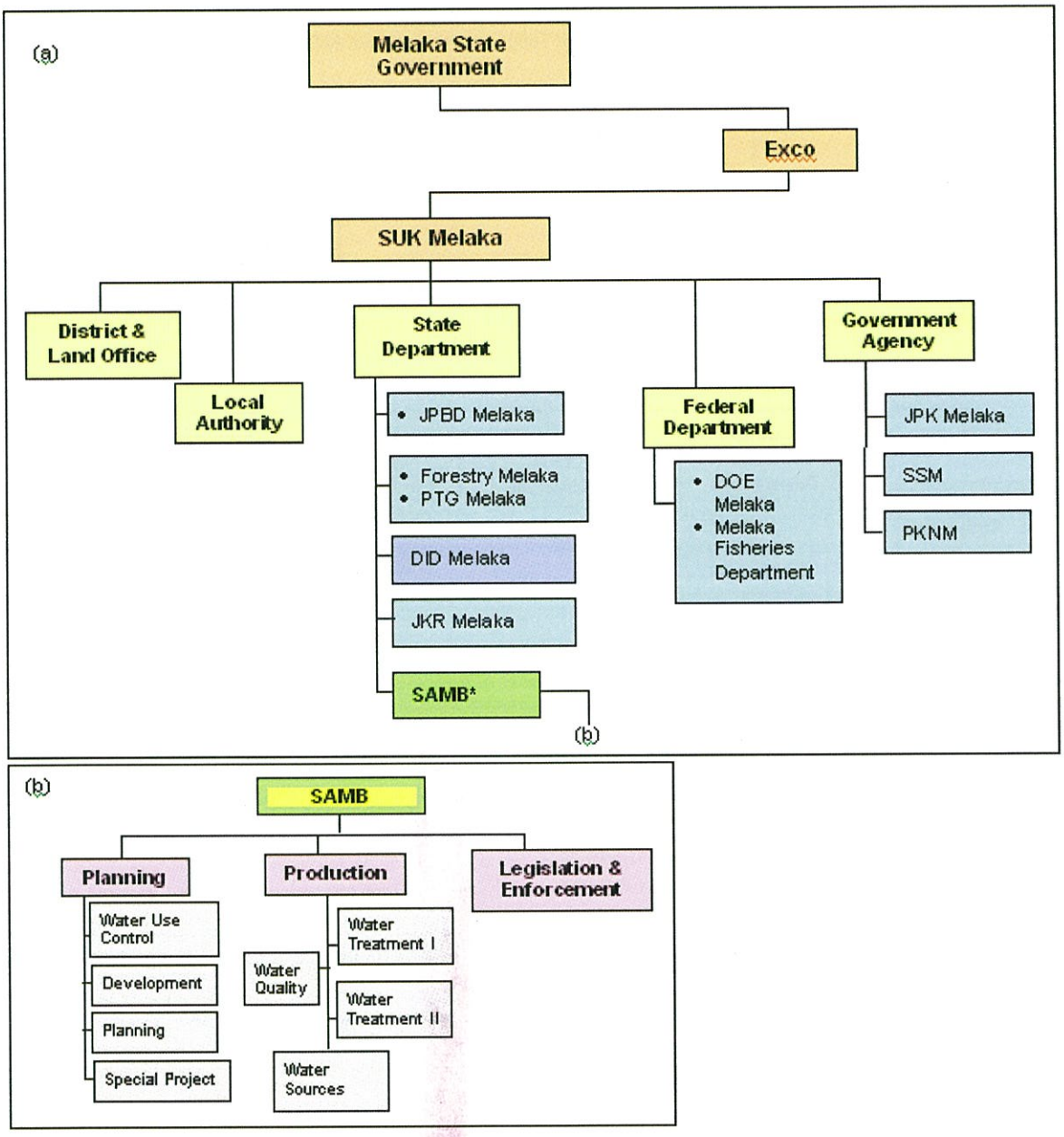


Figure A4.6.8 - Current Water Sector Arrangement in the State of Melaka

Source: Adapted from www.melaka.gov.my, www.samb.com.my, accessed on 12 October 2010.

Notes:

- SUK – State Secretary
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- PTG – Pejabat Tanah dan Galian (Land and Mineral Department)
- DID – Department of Irrigation and Drainage
- JKR – Jabatan Kerja Raya (Public Works Department)
- SAMB* – Syarikat Air Melaka Bhd – licensed for water supply by Enactment of Agreement 2004 with Melaka State Government – certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006
- DOE – Department of Environment
- JPK – Jabatan Pembangunan Koperasi Melaka (Melaka Cooperative Development Department)
- SSM – Suruhanjaya Syarikat Melaka (Company Commission of Melaka)
- PKNM – Perbadanan Kemajuan Negeri Melaka (Melaka Development Corporation)

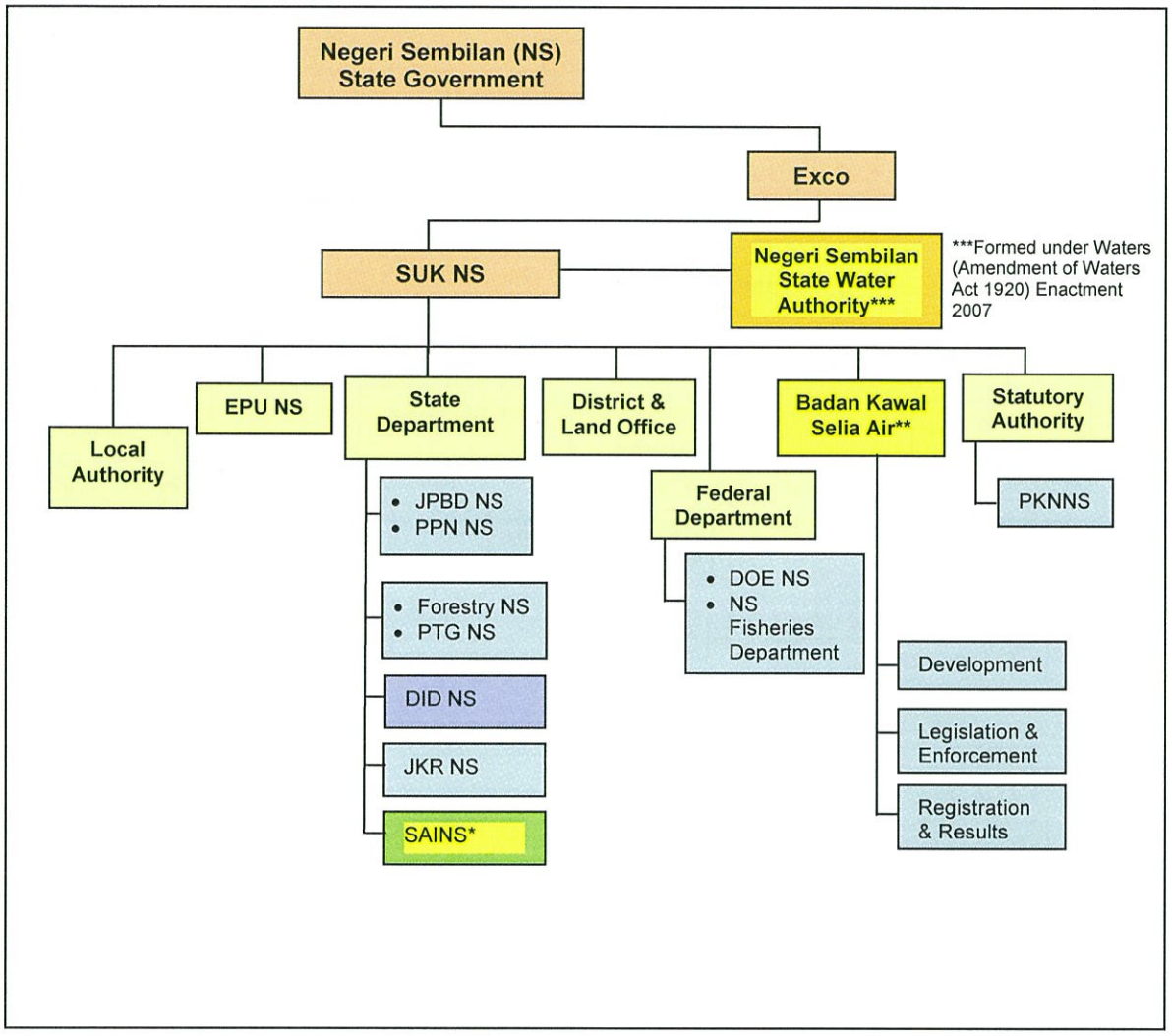


Figure A4.6.9 - Current Water Sector Arrangement in the State of Negeri Sembilan

Source: Adapted from www.ns.gov.my, accessed on 11 October 2010.

Notes:

- NS – Negeri Sembilan
- SUK – State Secretary
- EPU – Economic Planning Unit
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- PPN – Pejebat Pembangunan Negeri (State Development Office)
- PTG – Pejabat Tanah dan Galian (Land and Mineral Department)
- DID – Department of Irrigation and Drainage
- JKR – Jabatan Kerja Raya (Public Works Department)
- SAINS* – Syarikat Bekalan Air Negeri Sembilan – certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006
- DOE – Department of Environment
- Negeri Sembilan State Water Authority*** - formed under Waters (Amendment of Waters Act 1920) Enactment 2007 to advise State Authority on matters relating to water resources
- Badan Kawal Selia Air** – enforce under the Water Act 1920 (Revised – 2007) (Act 418)
- PKNNS – Perbadanan Kamajuan Negeri Sembilan (Negeri Sembilan Development Corporation)

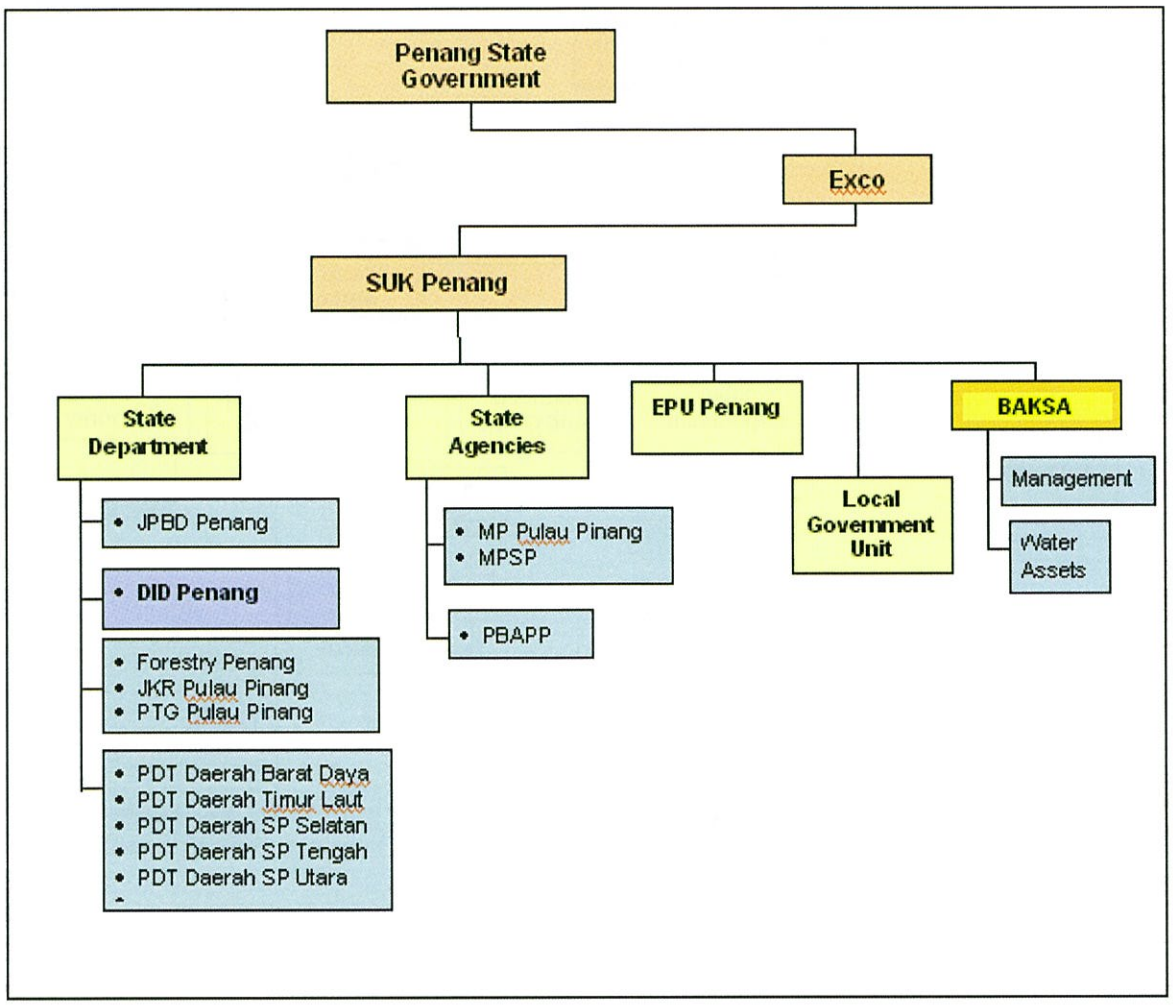


Figure A4.6.10 - Current Water Sector Arrangement in the State of Pulau Pinang

Source: Adapted from www.psuk.penang.gov.my, accessed on 11 October 2010.

Notes:

- SUK – State Secretary
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- DID – Department of Irrigation and Drainage
- JKR – Jabatan Kerja RayaPDT Daerah Barat Daya
- PTG – Pejabat Tanah dan Galian (Department of Land and Mines)
- PDT – Pejabat Daerah dan Tanah (District and Land Office)
- SP – Seberang Perai
- MP – Majlis Perbandaran (Municipal Council)
- MPSP – Majlis Perbandaran Seberang Perai (Municipal Council of Seberang Perai)
- PBAPP* – Perbadanan Bekalan Air Pulau Pinang (Pulau Pinang Water Supply Corporation Sdn Bhd) – certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006
- EPU – Economic Planning Unit
- BAKSA – Badan Kawalan Selia Air (Water Regulatory Body)

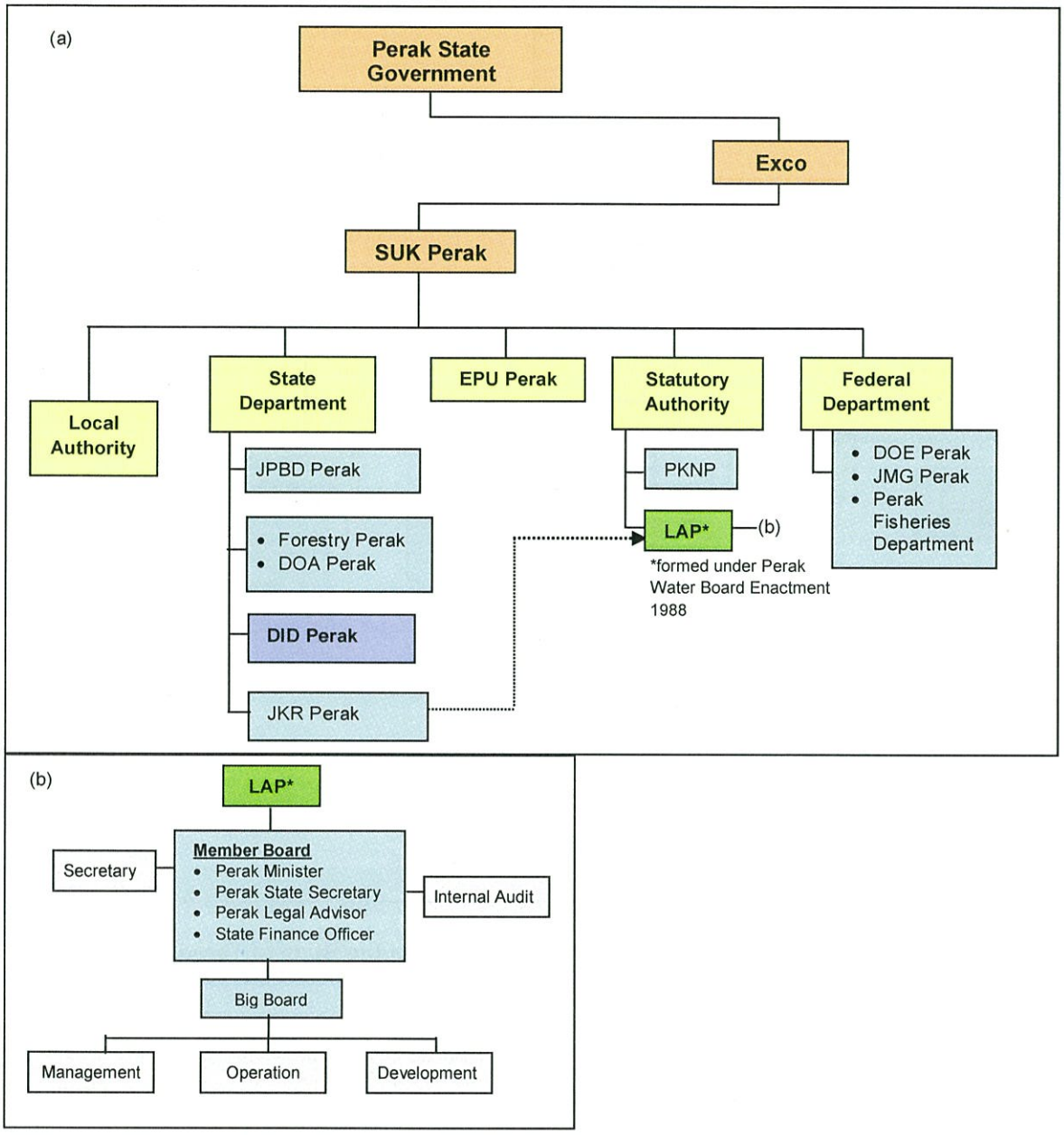


Figure A4.6.11 - Current Water Sector Arrangement in the State of Perak

Source: Adapted from www.perak.gov.my and www.lap.com.my accessed on 12 October 2010.
Notes: SUK – State Secretary

- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- DOA – Department of Agriculture
- DID – Department of Irrigation and Drainage
- JKR – Jabatan Kerja Raya (Public Works Department)
- EPU – Economic Planning Unit
- LAP – Lembaga Air Perak (Perak Water Board) – formed under Perak Water Board Enactment 1988, Perak Water Board Enactment (Amendment) 2003 and Perak Water Board (Successor Company) Enactment 2008; certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006;
- PKNP – Perbadanan Kamajuan Negeri Perak (Perak Development Corporation)
- DOE – Department of Environment
- JMG – Jabatan Mineral dan Geosains (Department of Mineral and Geoscience)

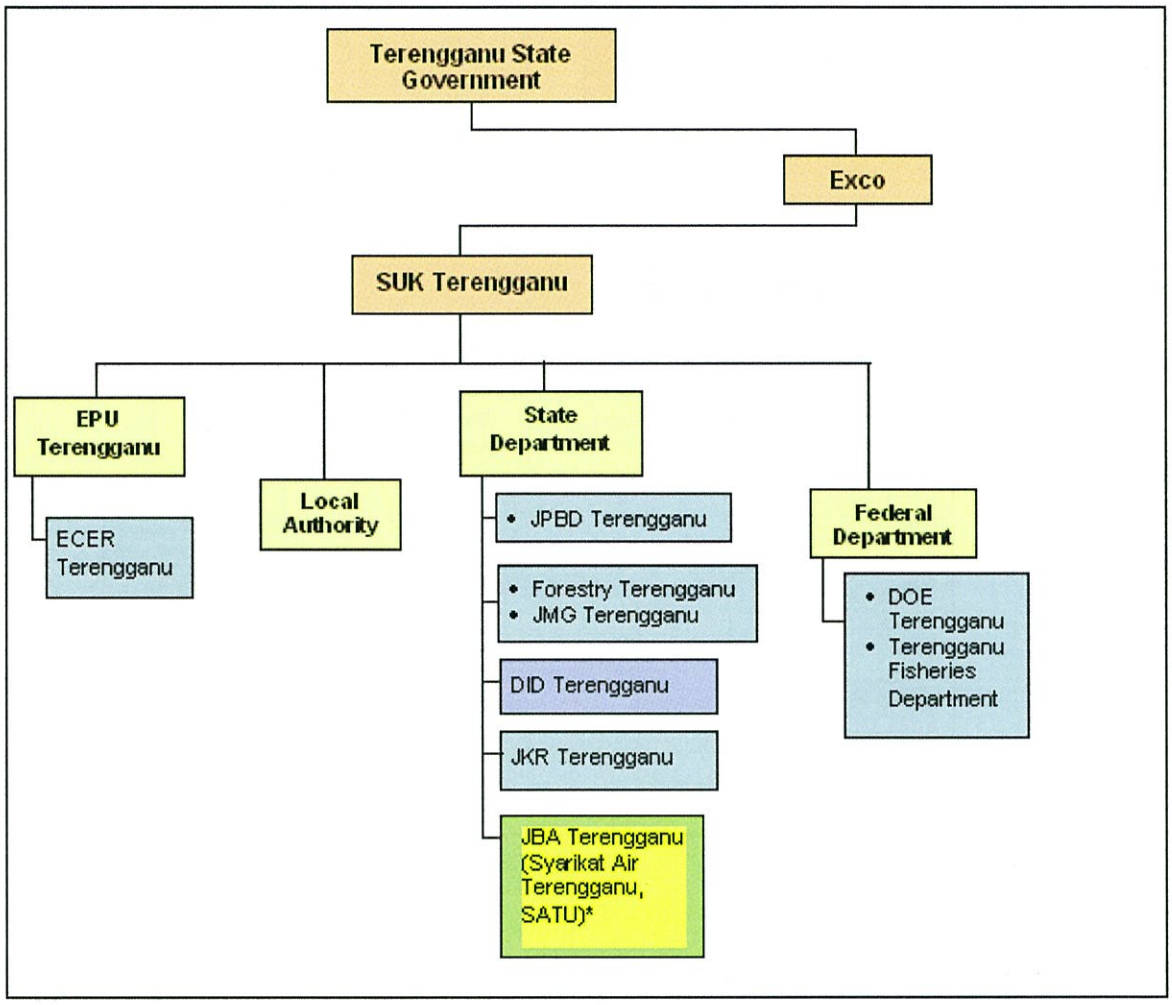


Figure A4.6.12 - Current Water Sector Arrangement in the State of Terengganu

Source: Adapted from www.terengganu.gov.my, www.jba.terengganu.gov.my, accessed on 11 October 2010.
Notes:

- SUK – State Secretary
- EPU – Economic Planning Unit
- ECER – East Cost Economic Region
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- JMG – Jabatan Mineral dan Geosains (Department of Mineral and Geosciences)
- DID – Department of Irrigation and Drainage
- JKR – Jabatan Kerja Raya (Public Works Department)
- JBA Terengganu (Syarikat Air Terengganu, SATU)* - Terengganu Water Company - certified agency as water supply operator appointed by SPAN under Water Services Industry Act (WSIA) 2006
- DOE – Department of Environment

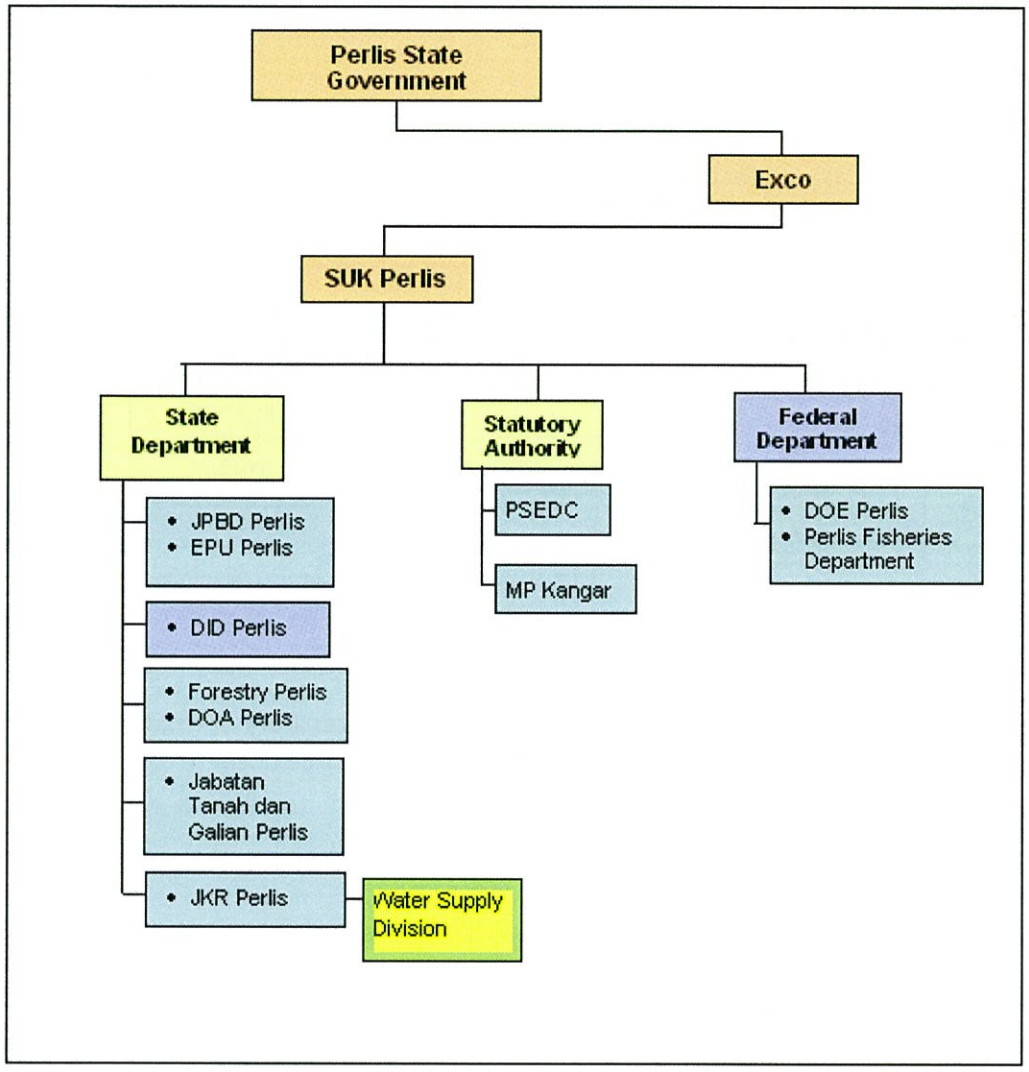


Figure A4.6.13 - Current Water Sector Arrangement in the State of Perlis

Source: Adapted from www.perlis.gov.my, accessed on 11 October 2010.

Notes:

- SUK – State Secretary
- JPBD – Jabatan Perancangan Bandar dan Desa (Town and Country Planning Department)
- EPU – Economic Planning Unit
- DID – Department of Irrigation and Drainage
- DOA – Department of Agriculture
- JKR – Jabatan Kerja Raya (Public Works Department of Malaysia)
- PSEDC – Perlis State Economic Development Corporation
- MP – Majlis Perbadanan
- DOE – Department of Environment

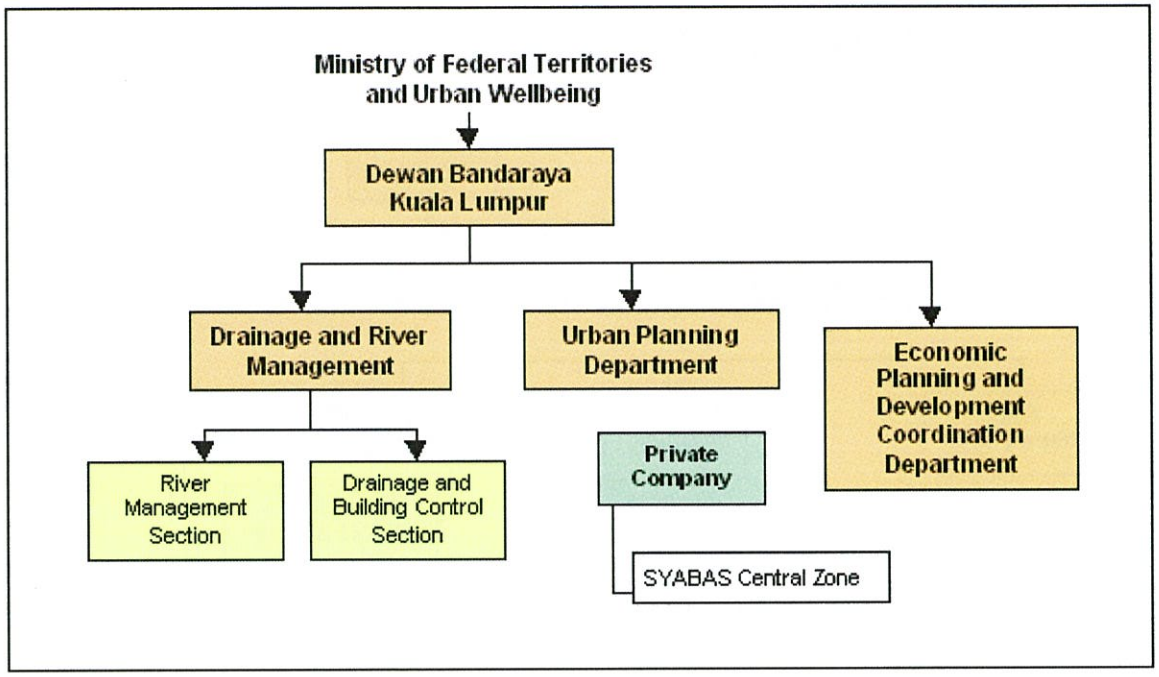


Figure A4.6.14 - Current Water Sector Arrangement in the Federal Territory of Kuala Lumpur

Source: Adapted from www.dbkl.gov.my, accessed on 12 October 2010

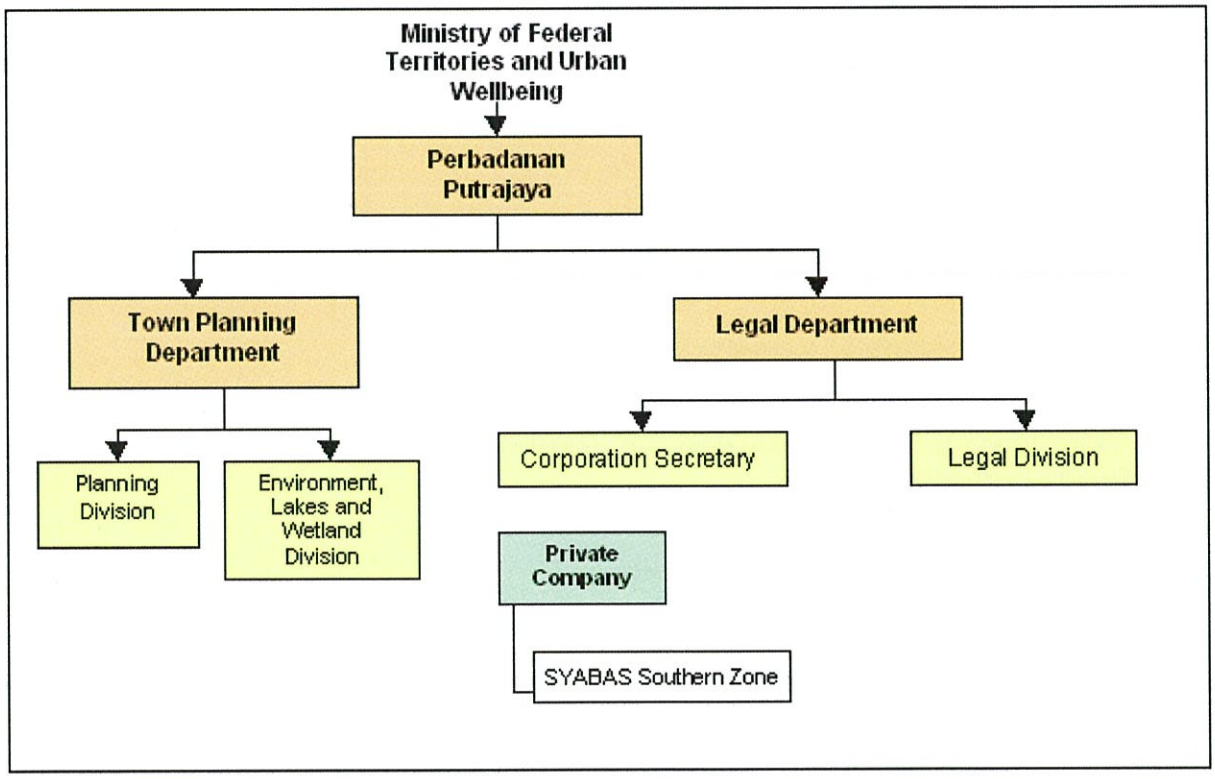


Figure A4.6.15 - Current Water Sector Arrangement in the Federal Territory of Putrajaya

Source: Adapted from www.ppj.gov.my, accessed on 12 October 2010

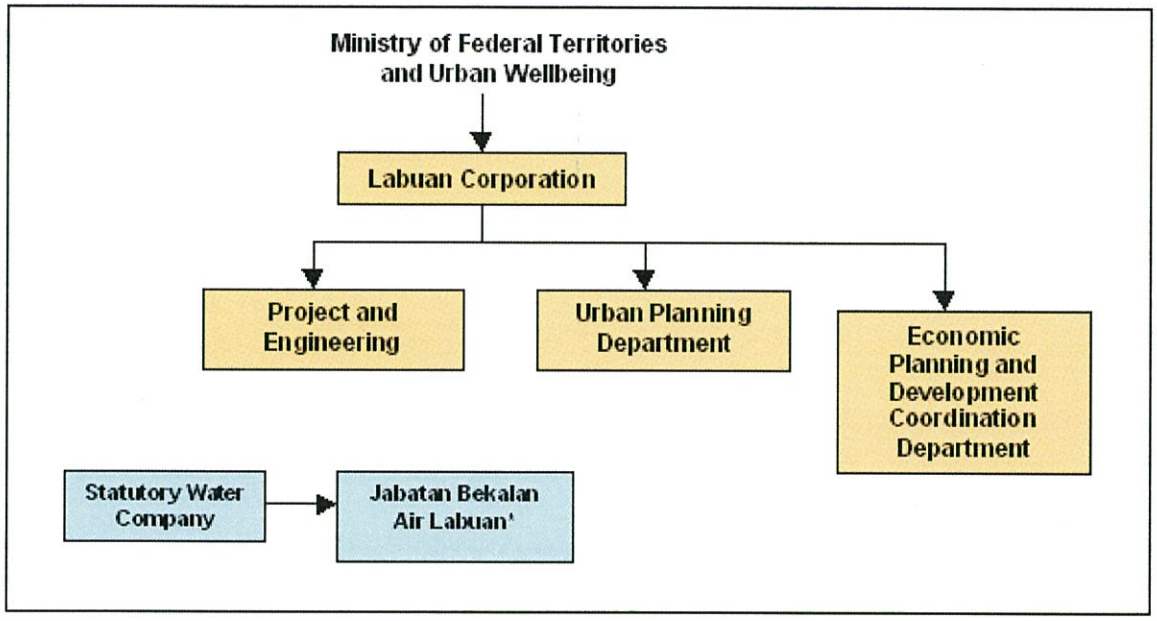


Figure A4.6.16 - Current Water Sector Arrangement in the Federal Territory of Labuan

Source: Adapted from www.pl.gov.my, accessed on 11 October 2010
Note: Jabatan Bekalan Air Labuan* is the main water supplier to Labuan Island

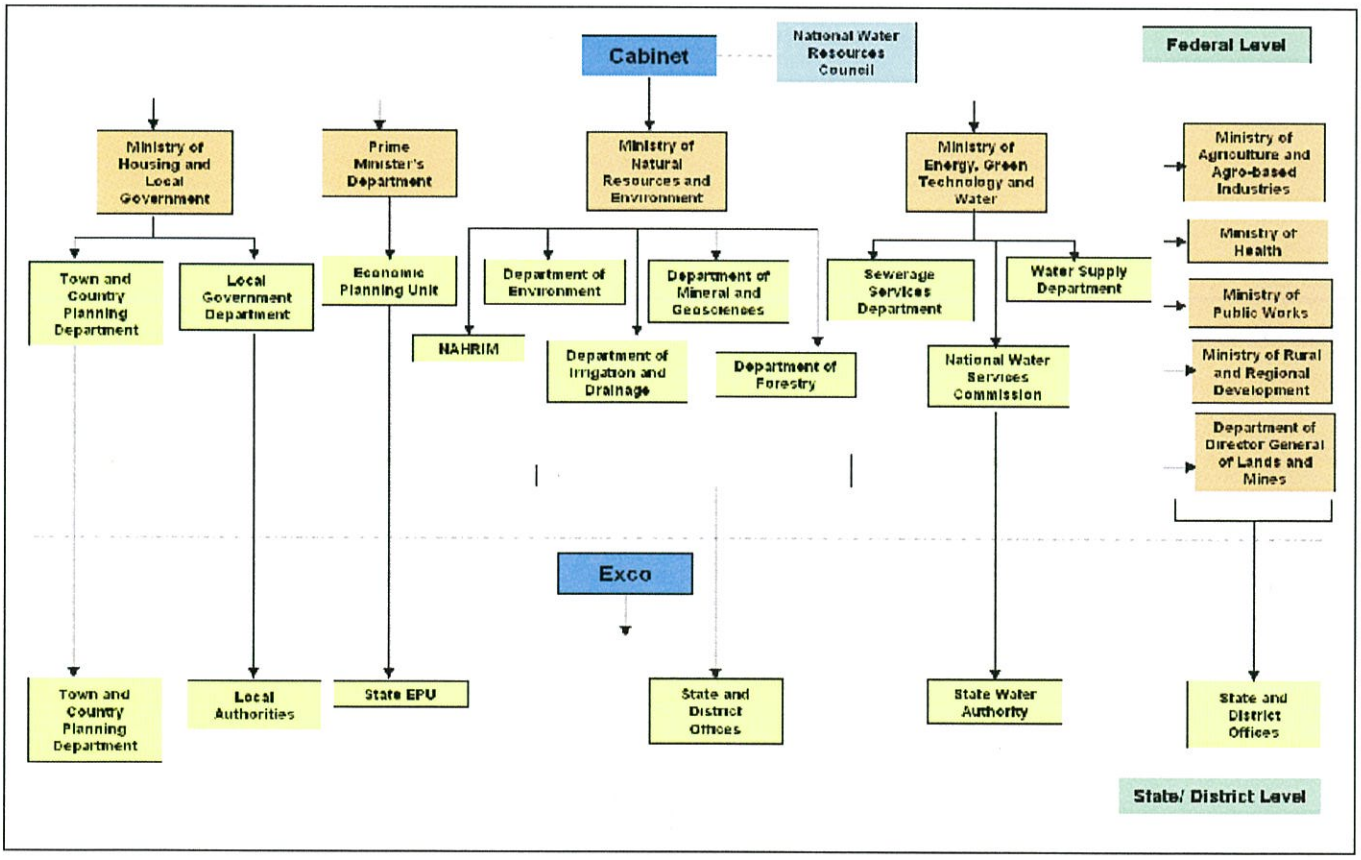


Figure A4.6.17 - Institutional Arrangement of Water-related Ministries in Peninsular Malaysia

Source: Adapted from Water Environment Partnership in Asia, accessed 21 March 2010.

Annex 4.7 – Summary of Institutional Arrangements in the States

ANNEX 4.7 – SUMMARY OF INSTITUTIONAL ARRANGEMENTS IN THE STATES

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
Kedah	Kedah Water Resources Enactment (2007) WSIA (2006)	Syarikat Air Darul Aman	Kedah Water Management Board (LUAN)	-	Not fully implemented	Menteri Besar of Kedah	• Deputy Chairman – State Secretary • State Legal Advisor • State Finance Officer • Water Resources Director • State Director of DID • State Director of DOE • State Director of JPBD • State Director of Forestry Department • State Director of Department of Lands and Mines • State Director of Water Supply Department • General Manager of MADA	• Ensure, maintain and facilitate the integrated and sustainable management of water resources and the water environment. • To regulate inter-basin transfer of water within the State. • To promote and facilitate cooperation and coordination between different agencies for multi functional uses of water resources. • To coordinate the exploration and development of additional water resources. • To develop its capacity and expertise to act as the central point of reference for IWRM issues in the State. • To advise the State Authority in respect of Inter-State management and transfer of water.

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
Pulau Pinang	WSIA (2006)	Perbadanan Bekalan Air Pulau Pinang	X	X	X	X	X	X
Perlis	X	JKR-JBA Water Supply Division	X	X	X	X	X	X
Perak	Perak Water Board Enactment 1988/ Perak Water Board Enactment (Amendment) 2003/ Perak Water Board (Successor Company) Enactment (2008)	Perak Water Board (LAP)	X	X	X	Perak Menteri Besar	• Perak State Secretary • Perak Legal Advisor • State Finance Officer	• Supply clean water to meet the needs of the population, both urban and rural, and the requirements of commerce and industry.
Selangor	LUAS Enactment (1999) WSIA (2006)	SYABAS	Lembaga Urus Air Selangor (LUAS)	-	X	Menteri Besar	• Deputy Chairman –State Secretary • State Legal Advisor or representative • State Financial Officer or representative Two members of the State Executive Council appointed by the Menteri Besar	• Provide advice to the State Authority on policies, methods and measures to be adopted to promote, nurture and facilitate the sustainable development, efficient use and conservation of water sources. • Develop, implement and promote infrastructure projects.

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
							• Director of the Federal DID • No more than 5 members appointed by State Authority who has substantial expertise in the management and conservation of river basins, ground water and water resources. • The Director shall be the Secretary of the Authority	Regulate and control inter-basin transfer of water within State. • Develop and implement guidelines, performance standards, methods and procedures pertaining to the management, utilisation and conservation of water sources. • Coordinate multi agency relationships in the State and promote cooperation and coordination for multi functional uses of water sources. • Adopt and implement policies, plans or projects by the Federal government as directed by the State Authority. • Undertake research pertaining to the management, efficient use, development and conservation of water sources and resources

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
								therein. • Provide training and maintain facilities for training related to the functions of the Authority.
Melaka	WSIA (2006) Water Enactment (2004)	Syarikat Air Melaka Bhd	X	X	X	X	X	X
Johor	WSIA (2006)	Syarikat Air Johor Holdings	X	X	X	X	X	X
Pahang	Water Resources Enactment Pahang (2007) WSIA (2006)	JBA Pahang	Pahang State Water Authority	-	X	Not available	Not available	• Overall responsibility for the control, management and regulation of water resources and raw water in the State of Pahang. • Authorise any supply authority or person to carry out the control and management of water resources and raw water.
Terengganu	WSIA (2006)	JBA Terengganu (Syarikat Air Terengganu, SATU)	X	X	X	X	X	X
Kelantan	Water Supply	Air Kelantan	X	X	X	X	X	X

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
	Enactment 1995, WSIA 2006	Sdn Bhd						
Sabah	Sabah Water Resources Enactment (1998)	Jabatan Air Negeri Sabah	Sabah Water Resources Council	-	X	State Secretary, Sabah	• Permanent Secretary of the Ministry of Culture, Environment and Tourism or the Secretary for Natural Resources • Director of the Department of Lands and Surveys • Director of the Forestry Department • Director of the Department of Agriculture or • Director of Water Resources • Director of the State EPU • Director of the Department of Town and Regional Planning • Director of the DID	• Advise the Minister on the management and use of water resources. • Report to the Minister on the condition of water resources. • Make recommendations on the improvement of the quantity and quality of water for the benefits of human use, the aquatic flora and fauna and the aquatic environment, including wetlands and floodplains. • Determine those water activity license applications which have State or regional significance or are of particular significance in a local area. • Adopt and review plans for the orderly and effective development of water resources. • Set priorities for, ensure the

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
							• Director of the Fisheries Department • Director of the Water Department • Director of the Department of Ports and Harbours • Director of the Federal Department of Environment (Sabah Region • Director of the Department of Geological Surveys • Two other members with appropriate technical or academic expertise in matters related to water resources.	development of, recommend for approval and review, catchment management plans developed under Part VI and other plans for the improvement in the management of water resources. • Develop and issue, with the approval of the Minister, State policies and guidelines for the management and protection of water resources. • Require public authorities to take action to implement the recommendations of an approved catchment management plan including taking enforcement action where relevant. • Act to minimise or prevent harm to water resources.
Sarawak	Sarawak Water Ordinance (1994)	• Kuching Water Board (KWB);	State Water Resources Council or	-	X	State Secretary, Sarawak	• Deputy Chairman - State Financial Secretary	• To identify all available water resources in the State and to promote the

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
		• Sibu Water Board (SEB), • Laku Management Sdn Bhd; • JKR (Water Supply Branch)	equivalent				• The Permanent Secretary to the Ministry of Resource Planning • The Director of State Planning Unit • The health authority • The Director of Public Works • The Director of Irrigation and Drainage • Not less than two but not more than five other members appointed by the Yang di-Pertua Negeri.	conservation, augmentation, development, management and proper use of these water resources. • To promote the integration of water resources and landuse, planning and management in the State. • To broadly monitor the plans and actions of any Government agencies or private agencies, which may significantly affect the quality or quantity of the water resources of the State. • To consider any matters affecting water resources referred to it. • In collaboration with the appropriate Government departments and agencies of the State or with any person or body, to initiate, conduct, or arrange studies, investigations and research relating to the water resources of the State in

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
								general and the availability and use of such water resources in particular. • On its own initiative, to make representation, to tender advice, and to make reports to the Government on any matters. relating to the development, conservation and management of the water resources of the State. In consultation with the health authority to ensure that the standards for safe drinking water are maintained by a water supply authority. • To promote and undertake measures to foster public awareness and understanding the conservation, management and use of such water resources. • To carry out or undertake such other functions as the

State	Mandate/ Legislation	Role	Structure			Membership		
		Water Service Provisions by	Board/ Department/ Agency or equivalent	SWRC	SWRD	Chairman	Members	Responsibilities
								Yang di-Pertua Negeri may require or direct or as may be conferred by this Ordinance or any other written laws.

Note:
SWRC: State Water Resources Council
SWRD: State Water Resources Department
X: not implemented or none or not applicable

Annex 4.8 – Benchmarking the Functions of DID

ANNEX 4.8 - BENCHMARKING THE FUNCTIONS OF DID

This **Annex 4.8** will deal with the selection of an agency to be the NWRD, and once selected, to benchmark the functions of the NWRD to a **Water Resource Functional Model (WRF Model)** that will provide the gaps and duplications in functions that need to be filled or dispensed with, respectively. This is followed by a set of recommendations regarding the functions and responsibilities of the NWRD, vis-à-vis the NWRC and the NWR Secretariat at the Federal level, and the SWRC at the State levels.

A4.8.1 WATER RESOURCE FUNCTIONAL MODEL (WRF MODEL)

(i) **Objectives:** In the Third Workshop from 30th September to 1st October 2010, the stakeholders have expressed that the DID is a prime candidate to become the NWRD as it is already providing technical support to the NWR Secretariat and the NWRC. This recommendation is now examined in more detail in this Section, with the first step to carry out a comparative analysis of the functions of all the major water–related agencies in the country. This is followed by the second step of benchmarking the functions of DID to the WRF Model.

(ii) To be objective, it is first assumed that any existing Government agency that is performing most of the water-related functions can become a prime candidate as the NWRD. The main criteria are that the NWRD must support the core thrust areas stated in the national water resources policy and legislation, and secondly, it must have corresponding line agencies that can translate the policies to the States

A8.1.1 Overview of the WRF Model

(i) The WRF Model consists of a list of water resource functions that a NWRD must and should have to be considered as a truly NWRD. The functional areas in the WRF Model and the sub-set functions identified under each were developed based upon a review of international best practices of functional institutional arrangements previously discussed in the Interim Report and a range of literature on water resources (Bandaragoda, 2000; North, 1990; Salath and Dinar, 1999a and 1999b; Hill et al, 2002; ADB, 1999; and Alaerts, 1996). The functions represent a broad range of functional requirements to achieve sustainable integrated water resources management (**Table A4.8.1**).

(ii) The WRF Model prescribes six (6) main functions; i.e. Water Resources Assessment; Water Resources Sustainable Integrated Management; Water Resources Allocation and Regulation; Water Hazards Management; Water Resources Technical and Scientific Support; and Intra-, Inter- and International Technical Water Resources Services.

(iii) The main functional criteria are divided into sub-functions, some of which are quite prescriptive, e.g. 'Water availability Audits' through to those that are more principles-based, e.g. the provision of specialist services. What is clear from the Model is that no single agency can achieve all the functions in the Model, but rather the main

component functions. In a country that has federal-state systems of government such as Malaysia, the functions can be further divided at the Federal and State levels or shared among the two levels. This division and/or sharing of functions (through a partnership approach) is often prescribed by the requirements in the Constitution (eg. The Federal List, the State list, or he Concurrent List), thus making the organizational functions more complex.

A4.8.1.2Description of the Six Main Functions

(i) The WRF Model (**Table A4.8.1**) provides for six main functions, these being;

(a) Water Resources Assessment;
(b) Water Resources Sustainable Integrated Management
(c) Water Resources Allocation and Regulation
(d) Water Hazard Management
(e) Water Resources Technical and Scientific Support
(f) Intra-, Inter- and International Technical Water Resources Services (sometimes the intra- and inter- technical services are separated from the international services, the latter will the form the seventh category of functions if is separated).

(ii) **Water Resources Assessment**: The function of '*Water Resources Assessment*' has two core functional areas, i.e. water quantity and water quality. The categories of water types shown in the WRF Model are; surface, ground, and coastal waters in all water bodies, i.e. rivers, lakes, wetlands, aquifers (groundwater), and coastal waters. The WRF Model divides the sub-set functions of *Water Resources Assessment* under four mid-level functions, i.e. '*water availability & audits*', '*national water resources census*', '*water requirement & demand assessment*', and '*pollution prevention & control*'. These sub-set function areas under each of these mid-level functions are not exclusive to the specific mid-level function *per se.* Some of the sub-set functional areas also relate to other main functions within the WRF Model. Therefore, these and many other functions should also be understood as potential cross-cutting functions.

(iii) **Water Resources Sustainable Integrated Management**: There are 10 separate yet linked sub-set functions in this major function, which relates to all water bodies, not just rivers and coastal waters. It focuses on conserving and/or sustainably managing water resources and the inherent ecosystems associated with them, including the applications of engineering and technological solutions.

(iv) **Water Resources Allocation and Regulation:** This function has four sub-set function areas; (a) to determine water abstraction and allocation limits; (b) to coordinate development and review of a raw water abstraction tariff structure; (c) the development and promotion of guidelines for raw water abstraction and return flow discharges, including setting minimum standards of discharges and return flows to be implemented by the States, and implementation of effective monitoring and review; (d) the development of a water abstraction prioritization system, and principles and

guidelines for a pricing structure (also implemented at State level). These sub-set function areas require implementation of the Model's main function '*Water Resources Assessment*'. Without implementation of the Water Resources Assessment function, much of the latter function of 'Water Resources Allocation and Regulation' will be impossible.

(v) **Water Hazard Management**: There are four core thematic water hazard threats identified. These are: (a) flooding, (b) tsunami, (c) storm surge, and (d) erosion. Also identified in the Model, are the processes for Water Hazard Management, i.e. risk assessment, monitoring, planning, management, implementation, and regulation.

(vi) **Water Resources Technical and Scientific Support**: Water resource technical and scientific support as a function, comprises of 10 sub-set functions. Grouped, the sub-set functions broadly relate to: (a) provisions of specialist service; (b) testing and development of new technology in water resource management; (c) project management of water development; (d) modeling and data management; (e) inclusion in EIA and other consultative processes; (f) in-house, specialist and non-specialist training and capacity building; (g) public education; and (h) publication of information and data on hydrology, morphology and water quality.

(vii) **Intra-, Inter- and International Technical Water Resources Services**: The essence of this function prescribed within the Model, is to provide for all commitments, obligations and treaties on all aspects of water resources management entered into by the government. The main function is divided into five sub-set functions; i.e. (a) inter-basin transfer of water; (b) advice and solutions on any trans-boundary water resource issue; (c) sale and administration and monitoring etc for water abstraction to other countries; (d) technical and specialist services relating to any international obligation in water resources management; and (e) management of projects and programs of an inter-State or inter-departmental basis.

(viii) If the international functions are separated from the intra- and inter- services, then the international functions will form the seventh category of functions.

Table A4.8.1 - Model Functions for Best Practices in Water Resources Management

MAIN FUNCTIONS	TYPES /LOCATIONS /COMMENTS	I.D	SUB-SET FUNCTIONS DESCRIPTIONS
1: *WATER RESOURCES ASSESSMENT* (planning, development, implementation, monitoring)	1.1 WATER BODY Water Quantity: • Surface water • Groundwater Coastal waters	**WATER AVAILABILITY AND AUDITS:**	
		1.1.1	• Water quantification and audit (including of water quality) of all water bodies, such as river systems (more than 189 large rivers), lakes (more than 900) and wetlands (more than 36), groundwater and coastal areas by seasons and peak use.
		1.1.2	• Provide detailed hydrological information and water balance data necessary for effective overall water allocation.
		1.1.3	• Undertake Water Basin Carrying Capacity Audit. - Strategically guided, supported, monitored and reviewed at Federal level - Implemented at State level
		1.1.4	• Determine quantity of water by water body sources that can be abstracted, taking into consideration factors such as seasonality, high and low flows and water body biological and ecosystem requirements etc.
		NATIONAL WATER RESOURCES CENSUS:	
		1.1.5	• Conducted once every five years or shorter periods to provide assessment of total water quantity and water quality status.
		1.1.6	• Custodian of a centralized storehouse and distribution centre for data and research on hydrological, morphological, biological and river water quality.
		1.1.7	• Coordinate standardized data collection, storage and use with other government institutions and provide a central data repository for water resource management related data.
		1.1.8	• Arbitration centre for all water resources conflicts between water sector use.
		WATER REQUIREMENT AND DEMAND ASSESSMENT:	
		1.1.9	• Identify and quantify abstraction water demand for all sectors, such as: industrial, commercial, energy production, agricultural and domestic requirements.
		1.1.10	• Determine water availability (with seasonal adjustments and environmental flow requirements etc) by location based on variable thresholds to minimize adverse effects on water body systems (e.g. water quality and ecosystem needs are met).
		1.1.11	• Provide policy guidelines regarding water allocations to non-financial sector use of water.
		1.1.12	• Administer environmental flow management requirements for all water bodies.

MAIN FUNCTIONS	TYPES /LOCATIONS /COMMENTS	I.D	SUB-SET FUNCTIONS DESCRIPTIONS
	1.2 WATER BODY Water Quality in all: • rivers • Lakes and wetlands • Groundwater • Coastal waters	**POLLUTION PREVENTION AND CONTROL:**	
		1.2.1	• Assess and monitor, and regulate point source pollution of all small and medium industries that discharge less than 60 m^3 per day (presently not under the jurisdiction of any department).
		1.2.2	• Assess, monitor and mitigate non-point source pollution or ambient pollution and sedimentation in rivers, lakes, wetlands and coastal waters.
		1.2.3	• Water quality maintenance in all the rivers, lakes, wetlands and groundwater.
		1.2.4	• Manage sand mining impacts on water resources, associated ecosystems and river morphology.
		1.2.5	• Promote, develop and coordinate activities to enhance the water body health, including biological functioning.
2: *WATER RESOURCES SUSTAINABLE INTEGRATED MANAGEMENT*	For water bodies such as rivers, lakes, wetlands, hill cloud forests as water source areas etc. Water is conserved for various uses, including non-abstractive uses. An ecosystem management approach is developed, promoted and applied through engineering and non-engineering innovative and adaptive technological solutions.	2.1.1	• Water resources conservation and sustainability planning in rivers and river basins (for lakes, wetlands and coastal areas with emphasis on water and aquatic ecosystem health and enhancement).
		2.1.2	• Manage maintenance programs of water source areas including cloud forest areas.
		2.1.3	• Rehabilitation, beautification and restoration of water bodies and their margins.
		2.1.4	• River reserve or river corridor, assessment, monitoring and management (riparian management and regulation).
		2.1.5	• Environmentally sensitive areas management (including for SNA where water is a factor; likely to be multiple agencies).
		2.1.6	• Non-consumptive use of water services/needs assessment & management (pollution control and monitoring), i.e. for: - Tourism; and - Transportation (navigation in freshwater areas)
		2.1.7	• Water body ecosystem research, management and planning for water bodies including coastal waters, and development and management of environmental engineering design guideline and/or standards.
		2.1.8	• Saline intrusion monitoring, control and mitigation, including through the control of groundwater abstraction.
		2.1.9	• Quantification, assessment and advice for all water impoundment (quantification and assessment).
		2.1.10	• Coordinate and guide IRBM planning for all 189 river basins, with inclusion of all water bodies, e.g. rivers, coastal waters, wetlands, lakes, and groundwater, to support State implementation.

MAIN FUNCTIONS	TYPES /LOCATIONS /COMMENTS	I.D	SUB-SET FUNCTIONS DESCRIPTIONS
3: *WATER RESOURCES ALLOCATION AND REGULATION*	Objective: Fair tariffs to reflect the real cost of raw water from the water body and return flows.	3.1.1	• Determine water abstraction limits for each water body (including seasonal and other factors in variable volume limit determinations), and determine allocation limits etc of water to water services sector, including; - Where abstraction can occur; - Inspection and monitoring of abstraction sites for compliance; - Guidance on water treatment systems/methods; - Managing and regulating water treatment locations; and Regulating and monitoring water treatment return flow locations to ensure standards are met (e.g. specified river water classification)
		3.1.2	• Coordinate development and review of a raw water abstraction tariff structure on the basis of water body carrying capacity, market forces, equitability and socio-economics.
		3.1.3	• Development and promotion of Guidelines for raw water abstraction and return flow discharges (in consultation with water services sector), including setting minimum standards of discharges and return flows to be implemented by States, and implementation of effectiveness monitoring and review
		3.1.4	• Develop a water abstraction priorisation system, and the principles and guidelines for water pricing structures for States.
4: *WATER HAZARD MANAGEMENT* (risk assessment, monitoring, planning, management, implementation, and regulation)	Risk assessment and planning over short & long term for all river systems & coastal areas, including wetlands, lakes, floodplains. Promote Best Management Practices. Focus on management and reduction of threat from floods, tsunami, storm surge & erosion.	4.1.1	• Conduct risk assessments for all major communities, and for communities that have been affected by water hazards, and oversee, support and review effectiveness of water hazard management planning at the river basin level (covering flood, tsunami, storm-surge and erosion threats).
		4.1.2	• Manage early warning systems, and enhance and promote risk management.
		4.1.3	• Assess and monitor urban drainage effectiveness and provide technical services to drainage system administrators, whilst promoting the use of MASMA.
		4.1.4	• Identify, assess, monitor, and regulate all flood management structures and works, and evaluate, and identify, assess and promote responsible management and placement of other structures or works that have a potential to lead to water hazard threats.
	Use of, Drainage Master Plans, River Basin Master Plans, MASMA, ESCP, Coastal Zone Management Plans.	4.1.5	• Manage, coordinate and/or promote the use of technical solutions for all aspects of flood-proofing, flood control and drainage, including provision of guidelines and standards promoting best management.

MAIN FUNCTIONS	TYPES /LOCATIONS /COMMENTS	I.D	SUB-SET FUNCTIONS DESCRIPTIONS
		4.1.6	• Be responsible for all technical aspects of coastal hazards management (including coastal stability, function and hazard management planning & research).
		4.1.7	• Provide technical solutions and inputs for rainfall maximization such as harvesting procedures, dams etc.
		4.1.8	• Control of erosion and sedimentation in rivers and all other water bodies including coastal waters.
		4.1.9	• Drought management, research, monitoring, early warning and mitigation.
		4.1.10	• Develop, coordinate and/or administer the provision of guidelines, standards, procedures, manuals and technical support in regard to water transportation in freshwater water bodies; and provide or raise necessary funding for navigational works required to promote safe, efficient and effective freshwater transportation practices.
5: *WATER RESOURCES TECHNICAL AND SCIENTIFIC SUPPORT* (research, development, pilot studies, testing, project management, awareness creation, capacity building, educational services in water resources management)	All aspects of water resources and water – related services and management	5.1.1	• Provision of specialist services (including provision of technical advice, development of guidelines and standards) to all water resources related service/management sectors or government agencies.
		5.1.2	• Testing and development of new technologies in water resources and biodiversity management, and water related industries.
		5.1.3	• Project management of large water resources projects.
		5.1.4	• Specialist input, advice and consultation on coastal development applications; and review and comment on EIA, detailed EIA, MEIA, PEIA, EA reports), and appraisal of hydraulic reports prepared by other institutions.
		5.1.5	• Computer and/or numerical Modelling and data management.
		5.1.6	• In-house formal and informal training and capacity building.
		5.1.7	• Specialist training for new technologies or water-related natural resource management requirements (e.g. aquatic ecosystems management, and water sciences etc).
		5.1.8	• Non-specialist training.
		5.1.9	• Develop and strategically guide a 'Public Education Program' for water resources management & water hazards management (in cooperation with other Federal Government Ministries & State governments).
		5.1.10	• Publish for open access & dissemination hydrological, morphological and water quality information and data (including for coastal areas).
6: *INTRA-, INTER- AND INTERNATIONAL TECHNICAL WATER*	Be the technical agency and one-stop centre in charge of all commitments, obligations and	6.1.1	• Inter-basin transfer of water.
		6.1.2	• Advice and technical solutions on any trans-boundary water resources issues within and between countries.
		6.1.3	• Sale, administration, monitoring, inspection and licensing for all abstraction of water by international countries.

MAIN FUNCTIONS	TYPES /LOCATIONS /COMMENTS	I.D	SUB-SET FUNCTIONS DESCRIPTIONS
RESOURCES SERVICES	treaties on all aspects of water resources entered into by the Government. Offer water resources technical and coordinating services.	6.1.4	• Technical and specialist services to all international treatise, obligations, programs and projects, entered into by the Federal Government with regards to all aspects of water resources management (MDG, climate change, WSSD, Agenda 21, etc).
		6.1.5	• Inter-State, inter-departmental water resources-related programs, projects, and committees.

A4.8.1.3Selection of NWRD: Comparative Analysis of Functions against the WRF Model

(i) The functions of existing water-related agencies at Federal level was assessed to provide the rationale in the choice of DID as the NWRD by the stakeholders. Some of the agencies in the States of Sabah and Sarawak have been included in this exercise due to their higher level of autonomy in water resource management. Essential to the outcome, was the raw scoring approach applied to determine the potential candidate agency best suited to be given the responsibility for water resources management at the national level and State level (one of the criteria is that, the Federal agency must have line agencies at the State level).

(ii) The scoring exercise is attached as **Table A4.8.2**. For the purpose of this benchmarking exercise, the sixth main function of the WRF Model was further divided into "International" and "Intra and Inter-State Matters". The scoring system was based on 7 main functions of the WRF Model (**Table A4.8.2**). A scoring system of 1 to 7 with the higher score being the best match was used for each agency. The agency with the highest score was then chosen as the NWRD.

(iii) In some cases, the functions of the agencies to the functions in the WRF Model were at best tenuous; but nevertheless, a score was still applied to acknowledge some functionality no matter how minimal or subsidiary to the Ministry's or department's core functions.

(iv) An important outcome of the scoring exercise was the realization that although the DID has had functions that fit most of the functions in the WRF Model, there are other government agencies also having direct or related functions in water resources management that should not be discounted. These agencies should not be seen to duplicate the functions of DID, but more as complementing the functions of each other. The primary reason for this conclusion is that each government agency related to the subject of water resources management, has often a unique purpose or aim for undertaking their water-related functions (e.g. the Department of Fisheries has a keen interest in water quality, but only insofar as it relates to fisheries and aquaculture), which is not necessarily solely for the purpose of sustainable water resources management, which comes directly under the portfolio of the NWRD. In

such cases, good water quality becomes complementary functions with all departments working towards the same goal of keeping the water clean.

(v) As can be seen in **Table A4.8.2**, the overall outcome is that no agency can have a full score of 7 out of 7, or 100%. The DID (scoring 5.5 out of 7) tops of the list in terms of relevance to water resource functions and therefore justified the choice made by the stakeholders.

(vi) At the Federal level, the DID scored the highest, with KeTTHA through SPAN coming in second with a score of 4 out of 7, followed by the Department of Environment with a score of 3.5.

(vii) At the State level, the State DIDs also come out very strongly in terms of scoring in all the States except in the Sarawak, where the Sarawak Water Resources Council has a score of 5 out of 7. All the States water resources councils, boards or departments also have high scores, mostly 3 out of 7, mainly because of their core functions.

(viii) In conclusion, based on the list of scores, the Study concurs with the recommendations and opinions of the stakeholders that the DID will be in a good position to take on the functions of the NWRD. However, in doing so, the DID should change it's name to reflect the functions of a water resource department, and this is recommended to be carried out immediately.

Table A4.8.2 - Macro Functions of Agencies against the Functions in the WRF Model for Best Practices in Water Resources Management

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
1.1	Department of Mineral and Geoscience/ Jabatan Mineral dan Geosains (JMG)	F	• Collection, analysis and dissemination of data and information relating to mineral exploration, mining and related activities, and groundwater status. • Ensuring mineral mining is conducted safely.	±	×	±	×	±	×	×	1.5/7
1.2	Department of Environment (DOE)/ Jabatan Alam Sekitar (JAS)	F	• Performs power under EQA1974. • Administration of activities for the prevention and control of environmental pollution and protection and enhancement of environment quality.	±	√	±	×	±	±	±	3.5/7
1.3	**Department of Irrigation and Drainage (DID)/ Jabatan Pengairan dan Saliran (JPS)**	F	• Development of planning and management of river basins. • Management of national water resources & hydrological data collection and research. • Planning and development of	√	√	√	×	√	√	±	**5.5/7**

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			infrastructure and water management for crops and other agricultural needs. • Planning and management of flood mitigation programs • Coastal Management.								
1.4	Department of Wildlife and National Parks (DWNP)/ Jabatan Perlindungan Hidupan Liar dan Taman Negara (PERHILITAN)	F	• Management of protected areas, national parks, wildlife reserves and wildlife sanctuaries. • Licensing under Protection of Wildlife Act 1972.	×	± i.e. Flora/Fauna mgt & biod	×	×	×	×	×	0.5/7
1.5	National Hydraulic and Research Institute of Malaysia (NAHRIM)	F	• Research relating to water resources, river, coastal, geo-hydrology and water quality.	±	×	±	×	√	±	×	2.5/7
1.6	Department of Marine Park Malaysia/ Jabatan Taman Laut Malaysia (JTLM)	F	• Restoration and conservation of the natural habitats of endangered aquatic species. • Establishment of	×	√	×	×	×	×	×	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			management zones for the conservation of aquatic flora and fauna.								
1.7	Forestry Department of Peninsular Malaysia/ Jabatan Perhutanan Semenanjung Malaysia	F	• Management of forestry resources, virgin forests, forest reserves and utility of forests (including catchment management of gazetted water catchments).	±	√	±	×	±	±	×	3/7
1.8	Department of Director of Lands and Mines/ Jabatan Ketua Pengarah Tanah dan Galian (JKPTG)	F	• Approving authority for sand mining and earth sources.	×	±	±	×	±	×	±	2/7
2.0	**Ministry of Housing and Local Government (MHLG)/ Kementerian Perumahan dan Kerajaan Tempatan (KPKT)**	F	• Responsible for development of housing. • Setting up & overseeing Local Authorities to establish a progressive society and a clean and healthy environment. • Strengthening and implementation of physical, social,	×	±	±	×	×	×	×	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			economic, and town and country planning environment in accordance with the Town and Country Planning Act 1976.								
2.1	Town and Country Planning Department/ Jabatan Perancangan Bandar dan Desa (JPBD)	F	• Secretariat for the National Physical Planning Council established under Town and Country Planning Act 1976. • Land-use and development planning. • Assist the State Government, local authorities and government agencies in preparing development programs.	×	±	×	×	×	×	×	0.5/7
2.2	Local Government Department	L	• Planning and budget allocation for local authorities for development projects including monitoring its implementation.	×	±	±	×	×	×	×	1/7
2.3	National Solid Waste Management Department/	F	• Coordination of development planning and monitoring the implementation of solid	×	×	±	×	×	×	×	0.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
	Jabatan Pengurusan Sisa Pepejal Negara		waste management projects.								
2.4	Solid Waste and Public Cleansing Management Corporation	F	• Administer and enforce the solid waste and public cleansing management laws and related matters.	×	×	±	×	×	×	×	0.5/7
3.0	**Ministry of Energy, Green Technology and Water/ Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA)** **(through SPAN)**	F	• Formulation of national policy on energy, renewable energy, energy efficiency. • Formulation of national policy on water supply services and sewerage services industry. • Planning and developing strategic directions for the water supply services and sewerage services industry. • Formulating and determining policy for Water Industry Fund and Sewerage Capital Contribution Fund. • Establishment and operation of Appeal Tribunal for water	±	±	±	√	±	±	±	4/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			supply services and sewerage services industry. • Joint secretariat with the Ministry of NRE and Environment for the National Water Resource Council Meeting.								
3.1	Sewerage Services Department/ Jabatan Perkhidmatan Pembetungan (JPP)	F	• Planning, designing, implementing and monitoring sewerage services projects.	×	×	±	±	√	×	±	2.5/7
3.2	Water Service Commissioner / Suruhanjaya Perkhidmatan Air(SPAN)	F	• Implement and enforce water supply and sewerage services laws. • Advise Minister on matters related to national policy objectives for water supply and sewerage services & tariff structure in water services sector. • To ensure productivity of water supply and sewerage services	×	±	±	±	×	±	±	2.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			industry and to monitor operator compliance. • Ensure implementation of privatisation projects in water services sector. • To ensure long-term sustainability of quality of water and sewerage services.		In relation to water services sector		In relation to water services sector				
3.3	Indah Water Konsortium Sdn Bhd	F	• Management, operation and maintenance of public sewerage system. • Certifying Agency for Sewerage Works Approvals in accordance to Section 174 of Performs power under WSIA 2006 (Act 655) for all state in West Malaysia and FT Labuan except Kelantan State (under Air Kelantan Sdn Bhd).	×	±	×	×	±	×	×	1/7
3.4	Water Supply Department/ Jabatan Bekalan Air (JBA)	F	• Performs power under WSIA 2006. Planning, designing, implementing and monitoring water supply projects.	×	×	×	±	±	×	×	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
3.5	Federal Territory of Labuan Water Supply Division	S	• Performs power under WSIA 2006. Operation and maintenance of water supply services in the FT Labuan.	×	×	×	±	±	×	×	1/7
4.0	**Ministry of Agriculture and Agro-based Industry**	F	• Formulation, planning and implementing National Agriculture Policy • Integrated Agricultural Development Area (IADA) • Agricultural irrigation and drainage	×	×	×	± In relation to water services sector only	±	×	×	1/7
4.1	Department of Agriculture/ Jabatan Pertanian	F	• Advice and technical support services in the agricultural sector.	×	±	±	±	±	±	×	2.5/7
4.2	Department of Fisheries/ Jabatan Perikanan	F	• Formulation of policies and strategies for the development and management of the fisheries sector. • Enforcement of Fisheries Act 1985. • Development and management of aquaculture and inland fisheries.	±	±	×	×	×	×	×	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			• Management and monitoring of recreational fisheries. • Sustainable development, management and conservation of fisheries resources.								
4.3	Malaysian Agricultural Research and Development Institute (MARDI)		• Consultancy and technical services to support the development of food and agriculture industries.	×	±	×	×	±	×	×	1/7
4.4	Lembaga Kemajuan Pertanian Kemubu (KADA)		• Modernising irrigation systems, pump houses and other basic facilities to improve efficiency and effectiveness of water supply.	×	±	×	×	± For irrigation and drainage of agricultural lands	×	×	1/7
4.5	Lembaga Kemajuan Pertanian Muda (MADA)		• Rice production.	×	±	×	± For irrigation and drainage of agricultural lands	×	×	×	1/7
5.0	**Ministry of Plantation Industries and**	**F**	• Planning and formulation of policies	×	±	×	×	±	×	×	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
	Commodities		and strategies as well as monitoring the development of upstream and downstream plantation industries.								
6.0	**Ministry of Works**	F	• Public health, disease control • Monitor and enforce water drinking standards.	×	×	±	×	×	×	×	0.5/7
6.1	Public Works Department of Malaysia/ Jabatan Kerja Raya (JKR) Malaysia	S	• Planning, supervision and maintenance the implementation of development projects, road, bridge, building construction and State and Federal level.	×	×	±	×	±	×	±	1.5/7
7.0	**Ministry of Rural and Regional Development (MRRD)**	F	• Manage the rural water supply scheme.	×	×	×	±	×	×	×	0.5/7
8.0	**Ministry of Health**	F	• Monitoring of the raw water quality at water intake points and for treated water quality	×	×	±	×	×	×	± Health matters only	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
8.1	Department of Health	F	• Monitor Water Quality for public health purposes	±	×	±	×	×	×	±	1.5/7
9.0	Ministry of Transport	F									
9.1	Marine Department, Peninsular Malaysia	F	• Safety of navigations in Malaysian waters • Marine Accident Investigation (oil spills, etc.)	×	×	±	×	×	×	×	0.5/7
10.0	**State Water Resources Councils/Boards**	S									
10.1	**Selangor Water Management Authority/ Lembaga Urus Air Selangor (LUAS)**	S	• Zoning, planning, research and information management in river basin and water resources management • Environmental management for activities excluded from jurisdiction of EQA1974 and Local Government Act 1976 • Control, manage and develop water resource infrastructure and	±	√	×	√	±	×	±	3.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			pollution control.								
10.2	**Kedah Water Resources Board/ Lembaga Urus Air Kedah (LUAN)**	S	• Facilitating the integrated and sustainable management of water resources and water environment of the state.	±	√	×	√	×	×	±	3/7
10.3	**Pahang State Water Authority LUAP)**	S	• Control, management and regulation of water resources and raw water in Pahang State. • Authorise any supply authority or person to carry out of water resources and raw water.	±	√	×	√	×	×	±	3/7
10.4	**Negeri Sembilan State Water Authority**	S	• Advise State Authority on matters relating to water resources, declaration of water catchment. • Coordinate policies in relation to the usage of raw water and raw water quality. • Encourage the efficient use of raw water supply. • Regulate and control	×	±	×	√	×	×	±	2/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			the allocation of inter basin transfer of raw water from, between and among States.								
10.5	Sabah Water Resources Council	S	• Management, use and protection of water resources. • Water activity licensing. • Adopt and review plans for orderly and effective water resource development, and set priorities for catchment management planning. • Develop State-level policies and guidelines for management and protection of water resources. • Require authorities to take action to implement recommendations from approved catchment management plans. • Act to minimise harm to water resources. • Recommendations on the improvement of water quality and	±	√	×	√	±	×	±	3.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			quantity to ensure sustainable outcomes for humans and ecosystems.								
10.6	Sarawak Water Resources Council	S	• Identify water resources and promote conservation, augmentation, development and management of water resources. • Promote integrated water resources and land-use planning and management. • Monitor plans or action of any government or private agency which may significantly effect water quantity or quality. • Advise on the formulation of policies and strategies to develop, manage and conserve water resources. • Participate in collaborative research relating to water resources.	√	√	±	√	±	±	±	5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			• Advise on supply and distribution of water. • Promote public awareness and understanding for water resource conservation.			Mainly so that public health-drinking water standards are maintained					
	Sabah										
11.0	**Ministry of Agriculture and Food Industry Sabah**										
11.1	Department of Irrigation and Drainage Sabah/ Jabatan Pengairan dan Saliran Sabah	S	• Planning and development of infrastructure and water management for crops and other agricultural needs • Implementation and management of coastal and river mouth siltation • Management of state water resources • Planning and management of flood mitigation works in rural and urban areas	√	±	√	±	±	×	±	4/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
11.2	Department of Agriculture Sabah	S	• Consultancy and technical support services in the agricultural sector in state	×	±	±	±	±	±	×	2.5/7
11.3	Department of Fisheries Sabah/ Jabatan Perikanan	S	• Sustainable development, management and conservation of state fisheries resources • Development and management of capture fisheries and aquaculture	×	±	×	×	×	×	×	0.5/7
12.0	**Ministry of Infrastructure Development Sabah**	**S**									
12.1	Sabah State Water Department/ Jabatan Air Negeri Sabah	S	• Acts under the water Supply Ordinance 1961 state water supply regulator and service provider • Water catchment management • Monitoring of raw water quality in the State • Regulator for privatized bulk water supply	±	×	±	√	±	±	±	3.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			schemes								
12.2	Sabah Works Department/ Jabatan Kerja Raya Negeri Sabah		• Planning, supervision and maintenance the implementation of development projects, road, bridge, building construction at State level	×	×	±	×	±	×	±	1.5/7
13.0	**Chief Minister's Department Sabah**	**F**									
13.1	Sabah Forestry Department	S	• Management and development of forestry resources in the State • Gazettement of forest reserves including water catchment areas	±	√	±	×	±	×	×	2.5/7
13.2	Natural Resources Office/ Pejabat Hasil Bumi	S	• Preparation of policy relating to natural resources (land, forest, mineral, mining, water resources)	×	√	×	×	×	×	×	1/7
13.3	Sabah Forestry Development Authority (SAFODA)	S	• Implementation and supervision of development of suitable areas from which timber has been extracted and other suitable areas	×	±	×	×	×	×	×	0.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			including planting or replanting								
14.0	**Ministry of Local Government and Housing**	**S**	• Strengthening and implementation of physical, social, economic, and town environment planning in the State	×	±	±	×	×	×	×	1/7
14.1	Town and Regional Planning Department Sabah	S	• State-wide planning services • Advisor to the Federal State Government and planning, landuse and development control matters	×	±	×	×	×	×	×	0.5/7
15.0	**Ministry of Tourism, Culture and Environment, Sabah**	**S**									
15.1	Sabah Wildlife Department (SWD)	S	• Implementation and administration of the Sabah Wildlife Conservation Enactment1997 • Conserves and regulates wildlife utilisation in Sabah and it manage a number of	×	√	×	×	×	×	×	0.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			protected areas								
15.2	Environment Protection Department	S	• Environmental planning, environmental screening on proposed development activities, Environmental assessment, environmental monitoring and enforcement, environmental development projects	×	√	×	×	±	×	±	2/7
15.3	Sabah Parks	S	• Protection and management of designated conservation areas as parks, for conservation needs and other uses	×	√	×	×	×	×	×	1/7
15.4	Environmental Action Committee	S	• To initiate a joint responsibility between the government and the people to carry out environmental activities that can contribute towards enhancing environmental quality	×	×	×	×	√	×	×	1/7
16.0	**Ministry of Rural Development Sabah**	**S**	• Planning and implementing socio-economic research programs for rural	×	±	×	×	×	×	×	0.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			communities								
	Sarawak										
17.0	**Chief Minister's Department Sarawak**	**S**									
17.1	Sarawak State Planning Unit	S	• Formulating the State socio-economic development policies and priorities at the macro, sectoral and regional level • To initiate, manage and coordinate the master plan and feasibility studies, and socio-economic programs/projects impact assessment	×	±	×	×	×	×	×	0.5/7
18.0	**Ministry of Environment and Public Health Sarawak**	**S**	• Policy making and advisory on issues related to environment and local authorities	×	×	±	×	×	×	×	0.5/7
19.0	**Ministry of Land Development**	**S**	• Formulate policy, plan and monitor land development program in the State • Plan and monitor	±	±	±	×	×	×	±	2/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			development of plantations and agriculture estates undertaken by the Sarawak Land Development Board • Provision and management of drainage and irrigation systems plan for agricultural projects, coordinate and monitor development of peat soil regions and wetland in the state								
19.1	Department of Irrigation and Drainage Sarawak	S	• Stormwater management, flood mitigation, urban drainage, wastewater water management, integrated coastal zone management, water resources assessment	√	√	√	×	±	±	±	4.5/7
20.0	**Ministry of Public Utilities Sarawak**	**S**	• Management of treated water in the State • Administration and enforcement of water ordinance, water supply regulations and licensing provisions in	×	±	±	±	±	×	±	2.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			the State • Development and management of existing water resources • Planning, coordinating and monitoring of water supply development projects in Sarawak • Planning, formulation and implementation of policies on water supply sector in Sarawak								
21.0	**Ministry of Housing and Urban Development Sarawak**	**S**									
21.1	Sewerage Services Department of Sarawak/ Jabatan Perkhidmatan Pembetungan Sarawak	S	• Planning, design and establishment of public sewerage systems • Regulation and management of sewerage services	×	×	±	± Service sector focused	√	√	√	1/7
22.0	**Ministry of Planning and Resource Management**	**S**	• To provide outline on the government's policies concerning forestry, development of land and natural	×	±	×	×	×	×	±	1/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			resources as well as physical planning development of the state								
22.1	Land and Survey Department Sarawak	S	• Urban and regional planning and design, control of development, control of subdivision of land, Issue of prospecting licences and mining leases	×	×	± In terms of planning	×	×	×	×	0.5/7
22.2	Department of Forestry Sarawak	S	• To constitute areas of forest as Forest Reserves, Protected Forest, Communal Forest, National Park, Nature Reserves and Wildlife Sanctuary	±	±	±	×	±	×	±	2.5/7
23.0	**Ministry of Infrastructure Development and Communication Sarawak**	S									
23.1	Public Works Department of Sarawak	S	• Manage and operating all 88 gazetted JKR water supply authorities in accordance with the requirement of the Water Ordinance 1994	×	±	×	√	±	×	±	2.5/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
			• Formulating and coordinating program in the planning, design and construction of water supply schemes • Establishing and upholding water supply standards and criteria								
24.0	**Ministry of Modernisation of Agriculture**	**S**	• Legislation in agriculture development	×	±	×	×	±	×	×	1/7
24.1	Department of Agriculture Sarawak	S	• Agriculture extension and development	×	±	×	×	±	×	×	1/7
25.0	**LAKU Management Sdn Bhd**	**S**	• Concession agreement with the State Government for the production, distribution of potable water and collection of water revenue in the 3 northern urban townships of Miri, Bintulu and Limbang in Sarawak	×	×	×	±	×	×	×	0.5/7
26.0	**Natural Resources and Environment Board**	**S**	• To control, stop, or prohibit the destruction of vegetation for the protection of natural resources, rivers and	×	√	±	±	×	×	×	2/7

No	Government Department/ Agency/ Authority	Level	Function in Relation with Water Resources	Main Functions of the Water Resources Management Model[2]							Function Match to MAIN FUNCTIONS (frequency)
				1) Water Resource Assessment	2) Water Resources Sustainable Management	3) Water Hazard Management	4) Water Resources Allocation and Regulation	5) Water Resources Technical and Scientific Support	6) International Technical Water Resources Services	7) Inter and Intra-State Matters	
	Sarawak/ Lembaga Sumber Asli dan Alam Sekitar Sarawak		other environmental elements • To provide rules, guidelines and directions for the protection and enhancement of environment relating to land use, protection of sources of water supply, exploitation of aquatic life & plants in rivers and foreshores, and any other matters over which State exercise legislative authority or powers								

A4.8.2 BENCHMARK ASSESSMENT OF FUNCTIONS IN DID AGAINST THE REQUIREMENTS OF THE WRF MODEL

Objectives: Having chosen the DID as the NWRD, the second exercise is to gauge the DID's current functions with the full requirements of the WRF Model (**Table A4.8.2**). In doing so, the gaps and duplications will be identified so that the functions of DID can be properly aligned as a truly functional NWRD in future in the country (**See Table A4.8.3** and **Table A4.8.4**).

A4.8.2.1Assessment Approach

(i) The assessment has identified some functional areas of the WRF Model for which DID has strong or moderate capacity at present or under the proposed re-organisation of DID, and those functional areas for which DID presently has limited or no capacity. In many instances, the areas in which DID have limited or no capacity, are in the main, relevant to functions of either the NWRC, Secretariat and State equivalent SWRCs. However, the analysis found that in many areas, the DID has a close functional correlation to the requirements of the WRF Model.

(ii) Currently, DID is undergoing a re-structuring exercise, which will make it more aligned to the water resources functions. Discussions with the DID personnel have indicated that some of the future functions will need to be benchmarked against the WRF Model too and therefore these will be included as part of the exercise.

(iii) Upon comparison of Federal DID Division Organisation Structures available on the DID website and those provided in reference documents, it became apparent that some re-organisation (as previously requested by DID in 2009) have already occurred. Accordingly, this has resulted in a need to carefully compare the difference between the current organization structure diagrams on the web site, and those additional functions from the re-structuring exercise, and those which are still considered to be proposed functions.

(iv) This exercise does not include an analysis of the functions of sections or divisions concerned within the internal working and/or administration of the DID, nor sections or divisions charged with non-water resources management engineering-type functions if not related to water resource management, e.g. structural or electrical engineering services offered in relation to on-going maintenance of DID or NRE buildings etc. The gap analysis focused specifically on functions related to water resources management only.

A4.8.2.2General Observations of Functional Gap and Duplication Analysis

A number of macro-level trends and patterns related to the institutional functional capacity for water resources management emerged during the analysis. These include:

(i) An assessment of current and proposed functions taken together suggested a stronger ability of DID to being able to meet more of the requirements in the WRF Model especially after the re-organization of DID functions.

(ii) If DID becomes the new NWRD, then further detailed assessment of the institutional arrangements and functionality will be required. However, for the purpose of this Study, the analysis shows a strong enough correlation to the WRF Model for DID to take on the functions of the NWRD.

(iii) Water quality management and control of pollution from causes other than erosion sources is not yet a significant aspect of DID function.

(iv) Functions related to water conservation and integrated approaches to water resources management need to be strengthened to fit in with the WRF Model requirements more closely, although many functional matches are evident.

(v) Current and proposed Federal DID functions are divided into very micro-level functions amongst various divisions that can cause duplications of functions.

(vi) A select few function descriptions within DID have yet to be clearly articulated and therefore can leave areas of ambiguity leading to uncertain purpose of functions.

(vii) A large number of proposed new functions under new sections or units within the *'Water Resources Management & Hydrology Division'* overlap and/or duplicate a number of water resources management functions currently prescribed within other DID divisions.

(viii) Frequent cases of potential duplication related to the compilation or development of guidelines, standards and procedures.

(ix) Current and proposed Federal DID functions are described at the micro-level and divided variously amongst divisions so as not to provide a solid base for a unified approach between or within DID division, which is essential to be able to meet a number of the main or sub-set functions of the WRF Model. Further elaboration on these initial observations is provided below.

(x) A limited ability or mandate to manage the effects of activities that may lead to adverse outcomes in flood hazard management, including limits to the scope of application of guidelines and standards developed by DID, i.e. they are often only for DID projects/structures or promoted to be referred to as best practice. A stronger legislative mandate for adherence to such instruments would provide more sustainable outcomes. All these will be discussed in more detail below.

A4.8.2.3Functions Assessment

(i) The requirements of the WRF Model are comprehensive and can be very challenging to meet, and hence it is conceived that even the best water resource management agencies in other countries, may not be able to always meet all the requirements of the WRF Model. Nevertheless, the Model is an ideal for which a DID can aim towards achieving. This will likely take some time, but the process of emulating the

requirements of the WRF Model is one step towards acknowledging the DID as the NWRD in the country. On the other hand, the DID/NWRD need not adhere strictly to the components in the WRF Model, but to customise the components as it deems fit to suit the circumstances and conditions of the country.

(ii) Prior to launching into the assessment, the key message that should be taken from this discussion is that although there may appear to be frequent occurrence of duplication or potential duplication in functions; this matter pales in contrast to the fact that if new proposed functions are implemented effectively, the combination of current and proposed functions of DID will lead to the conclusion that DID has a very high positive match of functionality to the WRF Model against which the DID have been assessed. Furthermore, there does not appear to be any other Federal agency able to match this reasonably high functional requirement, which was also highlighted during Workshops 2 and 3.

Water Resources Assessment

(i) **WRF Model function overview**: The WRF Model sub-set function 1.1.4 (see **Table A4.8.1**) focuses on quantifying all water bodies and the water availability for abstraction purposes. This function correlates twice with DID current functions, once where the DID function is almost a perfect match and the other occurrence when the DID function (at the micro-level) supports the function described in the WRF Model, but does not meet the full requirement. Although the correlation only occurs twice, it appears that the function is well met by the *'Water Resources & Hydrology Section'* of the *'Water Resources Management & Hydrology Division'*.

(ii) The next mid-level function area within the WRF Model is *'water requirement and demand assessment'*. This mid-level function area has within it more specific sub-set functions necessary to meet the objective of the mid-level function. In the case of DID current functions, they appear not to have any correlation with the mid-level function of *'water requirement and demand assessment'*, and therefore would not meet this aspect of functionality of a model water resources management authority. This gap would need to be addressed.

(iii) **DID current functions**: Central to water resource assessment is the national water census. The DID does not currently conduct a National Water Census as a mid-level function **(Table A4.8.3).** It is also not apparent that this function is met by any agency in Malaysia. However, the sub-set functions necessary for this mid-level function to take place are amongst the list of functions that the Federal DID does have, although in some instances the sub-set function links only in part to a function undertaken by DID. For example, for a National Water Census, there are three sub-set functions necessary. When these are cross-referenced against DID current functions, several sections within various divisions have functions that contribute to one or more of these sub-set functions in the WRF Model (e.g. 11 instances of

functional match). These functions are not undertaken for the purpose of carrying out a National Water Census. This demonstrates that if a National Water Census is a core function (or mid-level function), then Federal DID does have many capability areas (functional areas/activities) required to conduct a National Water Census. What is required is a clear mandate to undertake a National Water Census. A policy underpinning in terms of Federal information powers would assist greatly in providing a mandate.

(iv) DID has only a partial correlation with the WRF Model mid-level function of '*pollution prevention and control*'. The primary aspect where DID current functions most closely related, is for sediment control, and to a lesser extent maintenance of water quality through technical (often engineering based) solutions applied to manage water body riparian areas such as for river banks, and to a lesser extent mangrove restoration activities on occasions coordinated by the DID. Another functional area that supports this aspect is that of technical advice in the processing sand mining permit applications. Through this, DID should have the ability to set in place permit restrictions and criteria to limit adverse impacts upon water quality and river or coastal morphology; and if interpreted broader, the scope will cover aquatic biodiversity.

(v) **Duplication within current & proposed functions:** Current duplication potential within the *Water Resources Assessment* functions, appears limited mainly to instances where duplication *within* or *between* divisions is believed to hold the possibility of potential duplication. This highlights the need for careful and coordinated program management between divisions and/or sections in order to make best use of resources, data (including GIS), capacity and knowledge.

(vi) **Summary:** Overall, the gap analysis shows that presently DID fulfills about 60% the functional requirements in this part of the WRF Model, i.e. to be able to undertake *Water Resources Assessment*. A positive side is the fact that the DID currently has a strong ability in relation to *Water Resources Assessment*, in the areas of data collection and management, and the management and maintenance of hydrological instrumentation programs. These provide a solid basis to enhance the ability of DID to meet the remaining requirements of this core function. However, the functions currently undertaken by DID will need to capture all water bodies within the scope of their activities and programs as identified in the WRF Model, or else, *Water Resources Assessment* as a main (macro) function, will only be partially fulfilled, that is, if the lakes, wetlands and groundwater, are left out.

Water Resources Integrated Sustainable Management

(i) **DID current functions**: Currently on the whole, the DID does not have a close enough functional match to a number of sub-set functions within the WRF Model in this core function. Many current DID functions have similar

functions with the WRF Model only at the micro level. For example, the WRF Model sub-set functions 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.7 and 2.1.9 are either fulfilled to varying degrees or supported by DID current functions. Yet, the various ways in which the functions are met by DID may not always provide for the best coordination outcomes, as sometimes an action will occur for other purposes, such as for river riparian stabilization, or flood and erosion control, but not necessarily for water resources sustainable integrated management. Nevertheless, the current functions can be re-aligned with the main WRF Model if desired, although this will require some further internal capacity building for a balanced multi-disciplinary knowledge base within DID. Furthermore, promotion of alternative options apart from engineering and technological solutions would have to be given fair considerations in deciding how some of these issues can be managed.

(ii) The sub-set function of 'Saline intrusion monitoring, control and mitigation' (no 2.1.8) appears not to be a current function of DID. One further observation is that within the reference document that described Federal DID functions, no reference appeared apparent for the activity or function of coordinating or strategizing the Integrated Shoreline Management Plan (ISMP), yet this function is well known to be a key area in which DID has placed strong emphasis. It may be that the ISMP is considered a part of the wider IRBM or IWRM planning approach, and therefore is not given specific mention. Water resources within all forms of water bodies will need to be included within the activity programs of DID.

(iii) A well-considered proposed new function already articulated by DID would see (if implemented effectively by an inter-disciplinary team) considerable enhancement of DID's ability to meet a critical part of this main function within the WRF Model, e.g. the proposed function (summarized) is, "*development of an integrated management policy for water resources management; and to implement, coordinate and monitor IWRM policies, law, training, study, integration and planning*". The proposed new function incorporates crucial aspects of international best practices in IWRM, and therefore should be adopted by the new DID that will have to change its name to NWRD.

Water Resources Allocation and Regulation

(i) **WRF Model function overview:** This function of the WRF Model has four sub-set functional areas; when summarized these include: (1) to determine water abstraction and allocation limits; (2) to coordinate development and review of a raw water abstraction tariff structure; (3) the development and promotion of guidelines for raw water abstraction and return flow discharges, including setting minimum standards of discharges and return flows to be implemented by states, and implementation of effectiveness monitoring and review; (4) the development of a water abstraction prioritization system, and principles and guidelines for a pricing structure (also implemented at state

level). These sub-set function areas require the implementation of the WRF Model main function of '*Water Resources Assessment*'. Without implementation of the *Water Resources Assessment*, much of the latter function of '*Water Resources Allocation and Regulation*' will not be possible.

(ii) **DID current functions**: Overall, DID's current functions do not correlate well with the function of '*Water Resources Allocation and Regulation'*. Upon a review of DID's current functions, there appeared to be only one occurrence of correlation, that is, the '*Geomorphology Unit*' of the '*River Basin Section'* within the '*River Basin and Coastal Zone Management Division'*, which has a function for *water resource distribution and management*. Exercising this function may still require development of a legal or policy mandate.

(iii) Examination of the proposed new functions for DID, did not highlight any other instances where a proposed new function matched this main function of the WRF Model. This function is only seen as relevant to the new NWRD in terms of providing technical support. Therefore, a close match is unessential for the purpose of this assessment as the functional area is more in the domain of other entities. The NWRD can undertake this function such as to verify or carry out scientific investigations, to provide data on where, how and how much water can be abstracted from a river basin or returned to the water bodies by the water service users.

(iv) **Duplication within current & proposed functions**: As this function area of the WRF Model is not a current prime functional area for DID, with only one instance where some relationship match occurred, duplication with current functions is not an issue.

Water Hazard Management

(i) **WRF Model function overview**: '*Water Hazard Management'*, the fourth main function within the Model, is a functional area where Federal DID and State have a high level of association, capacity and current priority. The WRF Model has four core thematic water hazard threats; these are: flooding, tsunami, storm surge, and erosion. Also identified in the Model, are the stages in the process for water hazard management, i.e. risk assessment, monitoring, planning, management, implementation, and regulation.

(ii) In all, there were 72 instances where DID current functions show a relationship to *Water Hazard Management* functions prescribed in the WRF Model (**see Table A4.8.3**). The strength at which the correlations relate vary, where in some instances, the function match is more a case of current functions supporting a sub-set function within the WRF Model, or at times, closely mirroring the full requirement of the function or sub-function in the WRF Model.

(iii) **DID current functions**: This function of the WRF Model is very strongly supported by DID's current engineering and hydrological emphasis and expertise. However, as of late, the most relevant current functional activities relate mainly to flood control/drainage and erosion management and mitigation. The ability to directly regulate activities for the purpose of water hazard management is not perceived to be a strong aspect for DID except at the State level and in the Federal Territories. With a legal mandate, this essential aspect could be developed and included within the DID functional areas of activity and responsibility. Advice on and promotion of appropriate landuse near water courses, and water-based or related structures can only provide a partial solution. There are and will be future instances of inappropriate activity (e.g. poorly constructed flood-proofing on private lands that do not meet best engineering practices etc) where a legal mandate to regulate any activity (even if the form of regulation is indirect by requiring that such structures meet minimum guidelines) that have an effect on water hazard management outcomes, will be necessary. Without this, the WRF Model functions under *Water Hazard Management* will only be partially achieved by DID.

(iv) **DID future functions**: A select number of additional new functions would provide further enhancement of DID's ability in *Water Hazard Management*. For example, several new micro-functions related to managing dam safety will assist broadly in risk assessment and management. Furthermore, two proposed new functions for the *'Flood Management Division'* if adopted should enhance DID's ability to meet the needs of this main function of the WRF Model. These proposed functions are, (a) "To plan, conduct, coordinate and monitor a flood loss evaluation programs, and manage flood impact information system", and (b) "To plan, implement, coordinate, monitor and evaluate flood infrastructure asset management, and audit flood mitigation physical aspects". The first of these two new proposed functions could be easily couched into the Federal list in relation to the management and collection of scientific information and data. This key point should not be overlooked in identifying the legal basis for this function or any other proposed functions related to collection and control of information, where this is a Federal responsibility.

(v) One notable and common trend apparent within both the current and proposed DID functions description, is that some functions are often introspective, i.e. they focus on water hazard management of DID infrastructure. Needless to say, the application of these current and proposed functions to all structures and works of relevance to water hazard management, will lead to superior flood management and mitigation outcomes.

(vi) Another aspect of *Water Hazard Management* that would be greatly enhanced (i.e. WRF Model function 4.1.9) if the proposed new functions of the proposed new section in the *'Hydrology Monitoring and Prediction*

Section' within the *'Water Resources Management & Hydrology Division'*, includes drought management and lake management and their mitigations. However, if all the proposed functions under this new section were adopted, then there would be a need to rationalize the distribution of functions in the *Hydrology Division* to take on these additional new functions.

(vii) **Duplication within current & proposed functions***:* There is a high frequency of functional matches between the WRF Model and current DID functions, found within many units, sections or division of Federal DID. As a result of the strong emphasis by various DID divisions in *Water Hazard Management* (and all the associated supporting sub-set functions), there are a few instances of likely functional overlaps, duplication and perhaps even conflict (**see Table A4.8.4**). The most prominent amongst the divisions where duplication of this function area appears likely is between the *'Flood Management Division'* and the *'Water Resources Management & Hydrology Division'*. More specifically the functions or activity of data management (and repository development), and modeling highlighted what appears to be a common potential duplication thematic area. Some rationalization or more precise description and boundary-setting of function descriptions by divisions, along with increased inter-divisional cooperation, may serve to promote an enhanced integrated outcome for all, and indeed be beneficial for strengthening this core functional area of *Water Hazard Management.*

(viii) One of the DID current functions, that of preparing a 'national coastline vulnerability index' (**see Table A4.8.3**) is also a function but currently under the control of NAHRIM. NAHRIM has been undertaking this function (or best described as an activity) for some time now. Therefore, the inclusion of the function within the description of functions for the *'Info Unit of the Coastal Section, River Basin and Coastal Zone Management Division'* of DID, requires some clarification or possibly remediation. For instance, should this function be within the Info Unit, and if so, what about the role of NAHRIM? Should NAHRIM be bought back into the fold of DID and merge with the Humid Tropical Centre as the *Humid Tropical Hydrology and Hydraulics Research and Training Centre*, or should the function to provide **strategic national water resources indicators**, such as "a national coastline vulnerability index" be bought back under DID? If NAHRIM were to be bought within DID, this could result in very significant strengthening of research outcomes for not only DID but for the whole country, producing strategic national water resources indicators such as the *'national coastline vulnerability index'*, through monitoring all important aspects of water resources components, where research needs in hydrology, morphology and, perhaps water-related biodiversity and water chemistry research will provide the scientific support.

Water Resources Technical and Scientific Support

(i) **WRF Model function overview:** Water resources technical and scientific support as a function comprise of 10 sub-set functions. Grouped, the sub-set functions broadly relate to: provision of specialist service; testing and development of new technology in water resource management; project management of water development; modeling and data management; inclusion in EIA and other consultative processes; in-house, specialist and non-specialist training and capacity building; public education; and publication of information and data on hydrology, morphology and water quality etc.

(ii) **DID current functions:** Salient amongst the WRF Model sub-set function matches, is the common reference (i.e. more than 20 instances) of DID divisions, sections and units providing specialist services for the water related services sector or government agencies. This implies that this sub-set function of providing specialist services is strong amongst Federal DID's current functions. To a lesser extent, the WRF Model requirement for an agency charged with water resources management to conduct testing and development of new technologies is also reasonably addressed in some aspects. However, DID's current focus is in the main, related to hydrology, engineering and telemetry station/networks and modeling software and data management etc. An expansion of emphasis of a more multi-disciplinary approach would address this.

(iii) The '*Specialist Projects Division'* of Federal DID appears to achieve a solid match for the WRF Model function of managing large water resource projects. Although appearing to possibly duplicate this function, the '*Quantity Surveying & Contract Administration Division*' also with a similar functions, would provide a necessary check and balance so as to minimize any possibility of project failure. Model sub-set function 5.1.4 "Specialist input, advice and consultation on coastal development applications; and review and comment on EIA, detailed EIA, MEIA, PEIA, EA reports, and appraisal of hydraulic reports prepared by other institutions" is an exact match with a current function within the '*Development Control Unit* of the *Coastal Section* within *River Basin and Coastal Zone Management Division'*.

(iv) The sub-set function for computer and/or numerical modeling and data management prescribed within the WRF Model, is strongly supported by Federal DID current functions. Indeed an assessment of the frequency in which correlation occurs between the WRF Model and DID current functions also highlights a possibility for potential duplication.

(v) The training and capacity building WRF Model sub-set functions 5.1.6, 5.1.7, and 5.1.8 are also fairly common aspects of Federal DID's current functions, and therefore considered to match the WRF Model moderately.

(vi) **DID proposed functions:** Two of the WRF Model's sub-set functions that remain only partly met, are those related to public education (sub-set function 5.1.9), and publication and dissemination of information (sub-set function 5.1.10). The reason that the analysis finds these two sub-set functions only partially met by current DID functions is due to an unclear description of the functions, leaving uncertainty as to the breath or scope of the functions.

(vii) A set of proposed new functions within the *'Dam & Design Division'* offer DID the opportunity to enhance their ability to meet some further requirements of this WRF Model function, whilst also allowing enhancement against the Model function for *Water Hazard Management*. Specifically the proposed functions relate to promoting capacity in geotechnics and hydraulics research and assessment. Other proposed functions such as being a central reference point and technical advisor in environmental engineering would also improve DID ability in matching the needs of the WRF Model more closely in respect of scientific and technical support. Additionally, other areas of proposed new functionality, such as to study, research and pioneer new construction materials (also proposed by the *Dam and Design Division*) would seem appropriate to the WRF Model. However, these types of functions may be better undertaken by a dedicated research body that could work in support of DID. Other proposed new functions of relevance to the current discussion include proposed new functions for data quality control and employing or exploring new observation methods and technology in hydrology and remote sensing. Data quality control would appear to be an essential function that should be implemented and bought into the list of current functions, if not done so already.

(viii) **Duplication within current & proposed functions:** Amongst the main sub-set function areas with a significant potential for duplication either within or between divisions current functions are in respect of modeling, database or data-repository functions. Many instances of duplication or potential duplication are evident in **Table A4.8.3**. Around half of the proposed new functions relevant to model function *'Water Resources Technical And Scientific Support'* hold the potential for duplication of function with other divisions current functions (**Table A4.8.4**). However, careful rational planning would offset this duplication potential.

Intra-, Inter- and International Technical Water Resources Services

(i) **WRF Model function overview:** The essence of this function prescribed within the Model, is for DID to be the technical agency and one-stop-centre in charge of all commitments, obligations and treaties on all aspects of water resources management entered into by the Government. The main function is divided into five sub-set functions; i.e. (a) Inter-basin transfer of water; (b) advice and solutions on any trans-boundary water resource issue; (c) sale and administration and monitoring etc for water abstraction by other countries; (d) technical and specialist services relating to any international

obligation in water resources management; and, (e) management of projects and programs of an inter-state or inter-departmental basis.

(ii) **DID current functions:** The current functions of DID indicate no capacity or function relating to three of the Model sub-set functions, i.e. 6.1.1, 6.1.3, and 6.1.5. These aspects of the function appear to be a significant gap in functionality of an agency that would be responsible for water resources management. However, it may be decided that although desirable, these three sub-set functions may not form part of the mandate of the new water resources management agency. The current correlation matches between the Model and current DID functions shows that the other two sub-set functions, that of *provision of advice and technical services on trans-boundary water issues,* and *international obligations* are fairly well met by DID. In fact, the frequency with which the Model sub-set function 6.1.4 (technical and specialist services relating to any international obligation in water resources management-being the focal point) corresponds with DID current functions (**Table A4.8.3**), suggests that there may be frequent duplication if not coordinated efficiently. However, as stated elsewhere this issue can be resolved through careful implementation, and therefore is not considered highly significant.

(iii) **DID proposed functions***:* The two proposed functions that offer DID the potential to enhance their ability in the re-organisation to match the WRF Model in regard to intra-, inter- and international technical water resources services, are; (1) involvement at national level in dam safety monitoring (also enhancing water hazard management capability); and (2) to be part of the committee on disaster relief. If these proposed functions were adopted, then DID would be able to move closer to meeting the requirement of the Model sub-set function 6.1.5, where under the current function DID does not have any functional capacity.

(iv) **Duplication within current & proposed functions:** The key issue for duplication upon assessment of DID current and proposed functions in the context of the sub-set functions outlined within the WRF Model, is that duplication with other Ministries in regard to being a focal point for water-related international forums is commonplace. In some instances, such duplication potentials can be minimized (if the WRF Model part six is adopted fully) by setting in place coordination mechanisms to ensure such inter-ministry or inter-departmental duplication is addressed.

(v) One Ministry of which duplication in this functional area may be apparent, is with the Ministry of Science, Technology and Innovation, which also have a strong emphasis in being a focal point for international agencies or obligations such as through the UNESCO, WMO etc. Apart from this aspect of duplication potential, the obvious duplication instances highlighted in **Table A4.8.3** can be dealt with within DID through enhanced inter-division coordination.

(vi) Four of the proposed new functions related to this WRF Model function area, will likely lead to further duplication of functions within DID. The duplication as in many other cases may not necessarily become a reality; however, the high frequency of function duplication or potential functions duplication, implies one of three causes; (1) either there is a need for enhanced communication and coordination between divisions, or (2) the functions duplication potential has resulted from divisions being unaware that the function is within another division because the function may not be actively undertaken by the division that listed it as their function, or (3) the function may in essence be so subject-focused that each possibly duplication is actually a case of complementary functionality.

A8.2.4 Re-alignment of DID to be the NWRD

(i) The Study has given a very detailed analysis of the functions of DID and has benchmarked these functions against the functions in the WRF Model.

(ii) One of the key observations as a result of the functional assessment, was that alone, the current functions of DID only meet about 60% of the functional requirements of the WR Model (which is a reasonable high level to get to). However, when combining the current and proposed functions of DID as a whole (based on the re-organisation exercise that is being carried out), the match would be more in the range of 70-75% to the WRF Model. For DID to function as the NWRD, only minor adjustments and re-alignment of the existing functions are needed as the match is high as indicated in the Study.

(iii) The current functions in DID relevant to the WRF Model appear to be spread variously between divisions. In some cases this may have resulted from divisions seeking to address needs as they arise. Nevertheless, what has resulted is a wide spread of functional capacity (although not complete) which may not currently be focused towards the purpose of integrated sustainable water resources management. If the WRF Model is taken as a standard, and DID were to become the agency responsible for water resources management, then the adjustments will within the functions of the divisions rather than a complete overhaul of DID.

(iv) As highlighted previously, the DID will need to develop a mechanism to broaden the skills of its personnel in order to match the wide range of science and technical proficiency necessary for the future function. Broadly, skills relating to the natural and other physical sciences will have to be incorporated in the DID, e.g. in limnology, water chemistry, ecology, socio-economics etc.

(v) **Table A4.8.5** provides an approach of the direction of adjustments. The core areas where DID is already playing a significant role, such as in *Water Hazard Management* and *Water Resources Technical and Scientific Support*, these functions should be retained and perhaps further strengthened through the divisions. In areas where DID is presently playing a partial role such in *Water Resources Assessment*,

Water Resources Integrated Sustainable Management and *Intra-, Inter- and International Technical Water Resources Services,* it would need more adjustments and re-alignment of functions to reflect these components. In the core areas of *Water Resources Allocation and Regulation*, DID will need to build up the capacity to perform these functions such as in the preparation of regulatory guidelines and standards for water resource allocations in the river basins.

(vi) Within the divisions, the functions must be aligned to reflect the requirements of a water resources department. Ideally, all components and elements of water resources functions have to be included if possible.

Table A4.8.3 - Current DID Federal Functions by Division/ Section/ Unit

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Division 1[1]	*Water Resources Management & Hydrology Division*			
Functions	Hydrological data collection, processing and analysis for the purpose of water resources development and management.	Only partially supports Model Functions	√ Sub-function under 'Water Resources Assessment' (Quantity), and 'Hazard Management'	Supports 1.1.7 4
	Assessment of hydrological data to ensure accuracy and sufficiency for the purpose of water resources planning (e.g. development /management).		√ Sub-function under 'Water Resources Assessment' (Quantity), and 'Hazard Management'	Supports 1.1.7 4
	For the purpose of flood and drought mitigation and management, provide hydrological scientific services to relevant agencies involved in the management of major river basins in Malaysia.	Function focus is on hydrological data and science. Expect that there should be a close working relationship with the 'Flood Management Division' of DID.	√ Sub-function under 'Water Resources Assessment' (Quantity), and 'Hazard Management', and 'Water Resources Technical and Scientific Support'	Supports 1.1 4 5.1.10 5.1.1
Section	*Hydrology Station & Information Mgt Section*			

1 The numbering of divisions does not reflect nor imply any specific hierarchy or higher importance between DID divisions. The order in which the divisions are described by function in the table is a reflection of the translation process over many days (where time constraints close to a day's end meant picking up and translating a division that could have its functions translated within the remaining time in that day) from Bahasa Malay to English.

A		B	D	E
Current DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Functions	Manage, collect, process, store and archive hydrological data & information from hydrological stations throughout Malaysia (1450 Stations).		√ Sub-function under 'Water Resources Assessment' (Quantity), and 'Hazard Management'	1.1.7 4
	Publicly publish & disseminate hydrological information and data.		√ Sub-function under 'Water Resources Technical & Scientific Support", and 'Hazard Management'.	5.1.10 4
	Enhance the technical capability, accuracy and thoroughness of hydrological data collection, processing and analysis including through enhancement of the hydrological station network.		√ Sub-function of 'Water Resources Technical and Scientific Support'	5 5.1.2
	Implementation of a water quality program for all forms of water, e.g. surface, groundwater, and coastal.	Water quality related, but in the broad sense. The Model functions are more specific.	√ Sub-function under 'Water Resources Assessment' (Quality), also 'Water Hazard Mgt' in terms of public health	1.2 4
	To administer and coordinate the hydrology research program under the WMO, including by: guiding the hydrology working group; being the focal point for sub-program observations, the hydrology commission and global run-off data centre.	Very close correlation to the Model.	√ Sub-function of 'Water Resources Technical and Scientific Support', and 'Intra-, Inter- and International Technical Water Resources Services'	5.1.1 6 6.1.4
Section	*Flood Forecast Section*	DUPLICATION likely with Flood Mgt Division, although Section may be focused on other events, technical		

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
		support, modelling and data acquisition types, whereas the Flood Mgt Division is focused on mitigation and remedial planning.		
Functions	A. Oversee and/or prepare monsoon flood event and flashflood reports, and distribute promptly to upper management and other relevant agencies including DID divisions.	Strong match - More precise than the Model.	√ Sub function of 'Water Hazard Mgt' & 'Intra-, Inter- and International Technical Water Resources Services'	4 6.1.2
	B. Function as the national flood monitoring centre, to coordinate State-level flood responses.		√ Sub function of 'Water Hazard Mgt' & 'Intra-, Inter- and International Technical Water Resources Services'	4 6.1.2
	Monitor all telemetry stations throughout Malaysia through a centralized website.	This function appears context specific for this Sections primary purpose only. Therefore a partial match.	√ Sub function of 'Water Hazard Mgt'	4
	Provide flood status reports, and accurate up-to-date information on flooded areas, particularly for flood-prone locations.		√ Sub function of 'Water Hazard Mgt' & 'Intra-, Inter- and International Technical Water Resources Services'	4 6.1.2
	Develop forecasting models and flood warning systems for major river basins throughout Malaysia in order to enhance current systems for flood forecasting, including undertaking improvements to the current telemetry network.	Uncertain whether the section would also maintain or operate the warning system. This is not clear from an assessment of the function.	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4 5.1.2

A		B	D	E
Current DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Section	*Water Resources and Hydrology Section*			
Functions	Provide an advice service to DID functionaries, government agencies, consultants, developers etc in design, analysis, and hydrology modeling for drainage structures, irrigation, and water resources.	An advice service is a part of specialist service provision as included in the Model. Partial match.	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	Supports 4 5.1.1
	Research, prepare, develop and distribute guidelines, manuals and design procedures including hydrology analysis for use by DID departments and government agencies, consultants, developers etc.	Supports most sub-function areas of part 5 of the Model.	√ Sub function of 'Water Resources Technical and Scientific Support' & 'Water Hazard Mgt'	5.1.1
	Conduct monitoring, research, and analysis on drought events and publish and distribute preliminary information on these throughout Malaysia.		√ α Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4 5.1.10
	Implement a research-based water resources assessment for surface and groundwater water resources development through hydrological research throughout Malaysia with findings published and distributed.		√ Sub-function under 'Water Resources Assessment' & 'Water Resources Technical and Scientific Support'	1.1.1 1.1.4 5.1.10
	To be the focal point for the 'UNESCO/Malaysia International Hydrological Program' and Secretariat at a national level for the annual 'World Water Day', and to be the focal point for any other hydrological-related programs under UNESCO or the 'World Meteorological Congress'.	Strong correlation with the Model	√ Sub function under 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
Section	*Hydrology Instrumentation Section*			
Functions	Provide technical support for the effective function of hydrological instrumentation for the Water Resource Management & Hydrology Division.	Only partly meets to scope of the Model-specific function in far right column. Should also support other DID divisions and other external agencies to meet the needs of this sub-function of the model	± Sub function of 'Water Resources Technical and Scientific Support'	Supports 5.1.1
	Maintain the national hydrology stations network, forecast telemetry stations network, and flood forecasting system.	Supports Model sub function in terms of provision of technical expertise.	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	5.1.1
	Identify & recommend hydrology instrumentation maintenance and update program, and new technology suitability for observation systems to optimize instrumentation performance.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2
Division 2	*Special Projects Division*			
Functions		Inconsistent hierarchy chart when compared with website (updated April 2010) & report (produced 2009). Appears that new structure may already be implemented identified in the report however the functions (or the HR) may not yet be in place.		

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	To ensure cost, time, quality targets and customer satisfaction of major projects are achieved.	These three functions on the left column capture the essence of the Model sub function 5.1.3. However, the current scope of these functions may not entirely apply to all projects undertaken by other DID divisions	± Sub function of 'Water Resources Technical and Scientific Support'	5.1.3
	To audit project implementation for the purpose of environmental management and occupational safety & health.		± Sub function of 'Water Resources Technical and Scientific Support'	5.1.3
	To promote best practice project management and quality outcomes for mechanical and electrical engineering services, inclusive of formulating and disseminating effective procedures, processes, guidelines, standards, templates and tools.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1 5.1.3
Division 3	*Bahagian Saliran Mesra Alam*	Same division as Urban Stormwater Division refer to the website organization chart for DID		
Functions	Promote reduction of flood occurrence and water contamination by encouraging use of eco-friendly approaches to urban stormwater drainage systems through MSMA.	In part this meets requirement of Model sub set function	± Sub function of 'Water Hazard Mgt'	Supports 4.1.3 4.1.5
	Promote the use of MSMA by all sectors involved in urban stormwater drainage, including through offering training programs to all relevant professionals in the	In part this meets requirement of Model sub set function	± Sub function of 'Water Hazard Mgt'	4.1.3 4.1.7

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	correct use of MSMA.			
	Monitor the effectiveness of the MSMA system throughout construction activities.	Part of the requirement of Model sub set function	± Sub function of 'Water Hazard Mgt'	4.1.3
	Develop policy, strategy, and guidelines and provide technical support to other agencies in efforts to give rise to the usage of eco-friendly drainage systems.		± Sub function of 'Water Hazard Mgt' & Water Resources Assessment' (Quality)	4.1.5 1.2
	Manage/monitor all urban stormwater drainage infrastructure through data collection and maintenance.	A requirements to meet the Model sub set function	√ Sub function of 'Water Hazard Mgt'	4.1.3
Division 4	*River Basin & Coastal Zone Management Division*			
Functions	Nil discussed			
Section	*Coastal Section*			
Functions	Nil discussed (functions under Unit description)			
Unit	*Erosion Control Unit*	This aspect of DID activity is a strong area of interest and therefore resource allocation		
Functions	Conduct planning and design work for coastal erosion, and supervise and manage conventional erosion control project implementation, including monitoring coastal erosion control structure performance after works are completed.	Mainly relevant to Model sub set function 4.1.8	√ Sub function of 'Water Hazard Mgt'	2.1.1 4.1.8
	To identify erosion problems and structural damage to coastline, and decide upon appropriate restoration	Functional aspects of Model sub set functions	√ Sub function of 'Water Hazard Mgt'	4.1.1 4.1.2

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	measures.			4.1.8
	To provide technical advice services for works (including coastal erosion control measures) in the coastal zone at State-level.		√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4.1.2 5.1.1
	Provide a workforce for the rehabilitation of mangrove and other forms of coastal wetlands.	Provide or oversee. Assuming that it is to provide and oversee workforce. Only partially meets requirement of Model sub set function	± Sub function of 'Water Resources Integrated Mgt' & 'Water Hazard Mgt'	Supports 2.1.3 2.1.1
Units	*Rivermouth Preservation Unit*			
Functions	Undertake planning and implementation of projects (including hydraulic studies) for the design of rivermouth preservation initiatives.	This aspect of DID activity is a strong area of interest and therefore resource allocation	√ Sub function of 'Water Hazard Mgt'	2.1.1 4.1.5 4.1.8
	Implement and/or supervise coastal flooding, drainage, rivermouth dredging and navigation aid installation program management.	Note: Marine Dpt complementary function for ports, coastal/marine navigation aid installation. DID river navigational aid installation program not known to be extensive yet. DUPLICATION potential with the 'Software System Maintenance and Development Section' of the 'Mechanical and Electrical Division'	√ Sub function of 'Water Hazard Mgt'	4.1.1 4.1.2 4.1.3 2.1.1 4.1.5 4.1.6 4.1.2

A		B	D	E
Current DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
	Coordinate and supervise the implementation of the, 'Usahasama Kerajaan Malaysia dan Thailand, iaitu project pembaikan muara Sungai Golok'.		√ Sub function under 'Intra-, Inter- and International Technical Water Resources Services'	6.1.2 6.1.4
Unit	*Development Control Unit*			
Functions	Provide technical advice for coastal zone development applications, review and comment on EIA, detailed EIA, MEIA, PEIA, EA reports (including through participating in the Comments Committee under DOE), and assess hydraulic reports from government agencies.	Technical advice is a part of these two Model sub set functions purpose, i.e. provision of specialist services & water hazard risk mgt	± Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4.1.2 5.1.4
	To provide a one-stop-centre committee for processing of sea sand-mining applications.	A function that provides an option to meet part of the requirements of Model sub-set function 2.1.7, which is related to "River and Coastal Ecosystem Management". Also the function correlates with sub set functions 1.2.4 & 4.1.7 to do with sand mining and coastal mgt.	± α √ Sub function of 'Water Hazard Mgt'	1.2.4 2.1.1 4.1.6
	To monitor the condition of Malaysia's coastline, promote the use of & review the 'Coastal Zone Management /Development Guidelines' & prepare new guidelines or content for guidelines as necessary, and	This function meets the requirements of the Model sub set function which is a broadly described function for coastal management.	√ α Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4.1.6 4.1.8 5.1.1

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	provide technical advice to the 'National Physical Planning Committee' and 'National Coastal Erosion Committee'.			
	To undertaker tsunami impact studies throughout Malaysia and disseminate the findings for the purpose of integrated agency response outcomes.	This specific function correlates with the intent of Model Main Function Area "Water Hazard Mgt" & 5.1.9 (relating to public education)	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4.1.1 5.1.9
Unit	*Information and Planning Unit*	Note: in the DID 'Request Paper for Re-organisation (Business Sector) Vol III' a description of functions for an Information Unit and a Planning Unit are given. However, website organization chart shows the units combined. Therefore, the function descriptions are combined and rationalized within this table.		
Functions	*Planning*: To coordinate and implement a DID-specific response (appropriately coordinated with other government agencies) and actions in the event of tsunami or typhoon occurrence.	A specific function related to the intent of Model sub set function on the matter of 'hazard risk management'	√ Sub function of 'Water Hazard Mgt'	4.1.2
	Involvement in any relevant international maritime forum and collaboration in cross-boundary oceanography and/or hydrography surveys.		√ Sub function 'Intra-, Inter- and International Technical Water Resources	6.1.4

A **Current DID Federal Functions By Division/Section/Unit**	B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
		Services'	
Coordinate and/or undertake: publishing and distribution of coastal information (including hydraulic/coastal information, maps, plans, wave data and tidal data), exhibitions, internal bulletins and department report preparation.		√ Sub function 'Water Resources Technical and Scientific Support'	5.1.10
Respond and take action on any public complaints involving the coastline related to coastal and/or water resources management.		α	
Observe and analyse coastline changes using computer software.	DUPLICATION. This function appears to duplicate a function of the 'Development Control Unit', which is also in the 'Coastal Section'.	± Sub function of 'Water Hazard Mgt'	4.1.8
Info Unit: Develop, update, and manage data and GIS information, LIDAR satellite imagery, remote sensing, and data for DSS, wave, wind, current and manage wave buoy instrumentation etc.	The function is likely to be related only to the coast. If broader, then there will be DUPLICATION with other Units, Sections in DID.	± Sub function of 'Water Resources Sustainable Integrated Mgt', 'Water Hazard Mgt', and 'Water Resources Technical and Scientific Support'	Supports 2.1.7 4.1.7 5.1.2
Develop, manage and maintain a coastal information repository database.	This function is broader than that outlined in the Model, i.e. this function covers the development, management and maintenance of other relevant data set additional to hydrological and/or	√, α Sub function of 'Water Resources Assessment'	1.1.7

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
		morphological.		
	To prepare detailed data inclusive of hydraulic research data for island development management.	A sub set of sub function 1.1.7 outlined in the Model and related to Function area 2 as well	√ Sub function of 'Water Resources Assessment' & 'Water Resources Sustainable Integrated Mgt'	Supports 1.1.7 2.1.5
	To prepare the national coastline vulnerability index due to sea water rise	DUPLICATION. This is exactly what NAHRIM are doing – their project is already underway and published for some geographic areas already.	√ Sub function of 'Water Hazard Mgt'	4.1.1
Unit	*Modelling Unit*	DUPLICATE functions (some) with Hydrodynamics Unit of the River Basins Section' also a part of this division & Hydrodynamics Unit of the Flood Mgt Division.		
Functions	• Numerical modeling for: o River basin and coastal areas; o Supplementing planning decisions and design projects ;carried out by consultants under supervision of Erosion Control Unit/Rivermouth Preservation Unit; o Identifying suitability of existing structures; o Development of tourism islands; and o Disaster management & hazard profiling.		√ Sub function 'Water Resources Technical and Scientific Support'	5.1.5
	Provide advice to other agencies on likely impacts from coastal development as identified through modeling	Also an important factor in integrated coastal management	√ Sub function 'Water Resources Technical	2.1.7 5.1.9

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	analysis.		and Scientific Support' & 'Water Resources Sustainable Integrated Mgt'	
	Provide advice on issues involving international borders concerning national water, particularly those of that are related to marine/coastal pollution of significant impacts of a geomorphological nature.		√ Sub function 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4
	Conduct R&D in modeling & develop and manage modeling accreditation framework.		√ Sub function 'Water Resources Technical and Scientific Support'	5.1.1 5.1.2 5.1.5
Section	*River Basin Section*			
Functions	Functions provided only by Units under the section.			
Unit	*River Management Unit*	Units main focus is **water quality**		
Functions	Undertake conservation and rehabilitation (including preventive measures) programs for water bodies within river basins.		√ Sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.1
	Manage the 'One-State-One-River Program'		√ Sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.1
	Develop mechanisms, systems and processes for the treatment of leachate from various sources, e.g. land-fills, wet markets, and commercial and industrial activities etc.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1 5.1.2

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	Develop and undertake a public awareness program/campaign for the purpose of enhancing the health of water bodies in river basins.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.9
	Streamline water quality research processes and outcomes for sustainable water resource management and water body health.	Water quality	±, √ Sub function of 'Water Resources Technical and Scientific Support'	1.2.3 1.2.5 5.1.2
	As custodian, manage the 'River Basin Registry' for Malaysia.		± Sub function of 'Water Resources Assessment'	1.1.4
Unit	*River Maintenance Unit*	This units main focus is sedimentation & erosion control management		
Functions	Coordinate river maintenance works with State agency, including for: o River bank stabilisation o De-silting and o River cleaning.		√ Sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.2 2.1.3
	Develop and manage pilot projects for the purpose of river maintenance.		√ Sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.1 2.1.2 2.1.3
	Manage data collection, synthesis and analysis on the state of rivers and river banks, and undertake monitoring and enforcement.	GAP: Should include all freshwater water bodies, e.g. lakes and wetlands.	√, ± Sub function of 'Water Resources Assessment' & 'Water Resources Sustainable Integrated Mgt'	1.1.7 2.1.1

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Unit	*Hydrodynamics Unit*	Complementary functions (some) with Modeling Unit of the Coastal Section' also a part of this division. Unsure if there may be any duplication?		
Functions	Manage and enhance the physical and computer modeling of river hydrodynamics, undertake monitoring and research, and manage any necessary software accreditation processes.	DUPLICATION with Hydrodynamics Unit within the Flood Mgt Division.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1 5.1.2 5.1.5
	Provide technical advice to other units, sections and government agencies in respect of river hydrodynamic.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
	Maintain the database for 'River Total Loading Capacity'.		√ Sub function of 'Water Resources Assessment'	1.1.7
Unit	*Geomorphology Unit*			
Functions	Water resource distribution and management	Why here? May be best to be the function of the 'Water Resource Mgt and Hydrology Division'	√ Sub function of 'Water Resources Allocation and Regulation;	3.1.1
	As part of the IRBM program, develop, distribute and provide an advice service for guidelines prepared for the management of riparian zones, including reserves and etc.	Note: This current DID function is focused on provision of advice for IRBM.	± Sub function of 'Water Resources Technical and Scientific Support' & 'Water Resources Sustainable Integrated Mgt'	2.1.4 2.1.5 5.1.1

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
	Act as focal point for NARBO, JICA and DANIDA.		√ Sub function 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4
	River Classification framework	Vague: Possible duplication as the 'River Basin Registry' is already with the 'River Management Unit' in the same Section	± Sub function of 'Water Resources Assessment'	Supports 1.1.1 1.1.5
	Develop, manage, implement and monitor the results of Malaysia's IRBM program, whilst providing strategic planning requirements for successful implementation throughout the country.	Important Note: This is the only unit/section in DID Federal responsible for such a crucial water resource management approach.	√ Sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.4 2.1.5
Unit	*River Information Unit*			
Functions	Coordinate a development program for RB-DSS, RB-IMS, RB-GIS and RB-SMS.		± Sub function of 'Water Resources Assessment'	5.1.2
	Coordinate GIS development for river basin management programs within the 'River Basin Section', and provide GIS-related technical advice and data.	DUPLICATION potential with the 'Information and Planning Unit' in the 'Coastal Section'.	√ Sub function of 'Water Resources Assessment' & 'Water Resources Technical and Scientific Support'	1.1 5.1.1 5.1.2
	Develop, manage and maintain river data and information repository database.	DUPLICATION potential.	√ Sub function of 'Water Resources Assessment'	1.1.7

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes ÷=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	Develop & manage training and human resource development requirements for the River Basin Section.	DUPLICATION potential with 'Human Capital Development Division'	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6 5.1.7 5.1.8
Division 5	*Flood Management Division*	Note: Website indicates some restructuring occurred- i.e. now divided into two section with units under each. Not all units correspond exactly with the requested re-structure shown in "DID Request Paper for Re-organisation (Business Sector) Vol III'. Functions translated relate to the structures as it appears to now be.		
Section	*Management & Maintenance Section*			
Functions	Plan, implement, coordinate, supervise and assess the 'Flood Management Division' yearly flood management program and five-year program for every State.	DUPLICATION potentially-within the whole Division. Some aspects of these functions may correspond or even duplicate those functions carried out by the 'Flood Forecast Section' within 'Water Resource Mgt & Hydrology Division' described at the start of the table.	√ Sub function of 'Water Hazard Management'	4.1.3
	Plan, implement, coordinate and supervise the preparation of a Master Flood Mitigation Plan for all States.		√ Sub function of 'Water Hazard Management'	4.1.1 4.1.2 4.1.3
	Plan, implement, coordinate and supervise the preparation of detailed design, and hydrodynamic analysis, drawings, and tender documents for	DUPLICATION	√ Sub function of 'Water Hazard Management' & 'Water Resources	4.1.2 4.1.5 5.1.1

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	engineering and construction of flood management infrastructure projects.		Technical and Scientific Support'	
	Provide specialist advice to other agencies on flood mitigation and remedy.		√ 'Water Resources Technical and Scientific Support'	5.1.1
Section	*Planning and Control Section*			
Units	*Non-structure Unit*			
Functions	Plan and formulate a national flood management framework, and plan and implement integrated flood management including the development of a pilot program including all aspects of human resource development needs.		√ Sub function of 'Water Hazard Management'	4 4.1.3
	Provide research, papers and documentation on potential future policy/legislative mechanisms pertaining to flood management for Malaysia.		α A sub function related to 'Water Hazard Mgt' but not part of the Model	-
	Develop and update as necessary guidelines for development in floodplains with focus on flood-proofing.	Note: Flood-proofing is one response to flood risk, what about others, i.e. retreat?	√ Sub function of 'Water Hazard Management'	4.1.5
	Implement a community awareness program on flood risk management measures with communities in floodplains, and prepare flood relocation planning as required.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.9
	Coordinate, manage and supervise flood management	DUPLICATION potential to lesser	√	4.1.2

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	activity through the 'National Water Resources Council' (NWRC) (? Suruhanjaya tetap bagi).	extent with Flood Forecast Section	Sub function of 'Water Hazard Management'	
Units	*Risk Management Unit*	Unit focused on flood risk		
Functions	Plan, implement, coordinate and supervise flood-risk management program throughout Malaysia, and coordinate and prepare standards and guidelines on flood-risk assessment, and undertake flood-risk mapping (inundation mapping).	DUPLICATION potential with 'Management and Maintenance Section' within the same division. However, most likely a subservient level activity under the Master Flood Mitigation Plans for each state	√ Sub function of 'Water Hazard Management'	4.1.1 4.1.5
	Provide specialized technical advice in flood-risk management to all relevant agencies at Federal, State, and local levels, and plan and implement human resource capacity building in flood-risk management.	Flood risk mgt technical advice & human capacity building	√ Sub function of 'Water Hazard Management' & 'Water Resources Technical and Scientific Support'	4.1.1 5.1.6 5.1.7 5.1.8
Units	*Adaptive & Innovative Unit*			
Functions	Research and study adaptation options for flood management planning and response, and promote inclusive integrated flood management programs at the inter-agency/departmental level, with inclusion of academia for developing enhanced flood management approaches.	Unit focused on research for best practice flood management	√, α Sub function of 'Water Hazard Management'	4.1.2 4.1.5
Units	*Performance and Monitoring Unit*			

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Functions	Plan, coordinate and administer flood mitigation programs undertaken by State-level authorities, and provide technical advice and support.	This unit focuses on ensuring implementation at State level, whereas the Master Flood Mitigation Plans are developed through the 'Management & Maintenance Section' within this same division	√ Sub function of 'Water Hazard Management'	4.1.2 4.1.5
	Assess and report on the effectiveness of the flood mitigation project programs implementation.	Very important function to assess the effectiveness of mitigation programs including all plan implementation	√ Sub function of 'Water Hazard Management'	4.1.1
Units	*GIS Unit*			
Functions	Plan/manage data collection (or access from other sources) in respect of shape files for flood risk management and mitigation/response planning purposes, i.e. topographic, cadastral and land-use maps, river cross sections and profiles, inundation areas, imagery etc.	Note: Complementary activity with other units (e.g. Information Unit) in River Basin Section and Coastal Section. But the focus here is on flood-related GIS data. However, the function could be undertaken by a specialist unit dedicated only to GIS and remote sensing.	√ Sub function of 'Water Hazard Management'	4.1.1
	Develop, coordinate, maintain and update GIS data-base (a repository) for flood management projects throughout Malaysia.		√ Sub function of 'Water Resources Assessment'	1.1.7
Units	*Hydrodynamic Unit* (also known as Hydro-informatic)	DUPLICATION potential with Modeling Unit and in particular the other Hydrodynamics Unit in the 'River Basin Section' of 'River Basin & Coastal Zone Mgt Division'.		

A		B	D	E
Current DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Functions	Plan, implement, manage and supervise hydrodynamic model development program for all river basins, including supervision of model migration to all States and model update techniques for changes in land-use, climate, river geometry, flood mitigation structures etc.	DUPLICATION: Direct duplication of functions with Modeling Unit and in particular the other Hydrodynamics Unit in the 'River Basin Section' of 'River Basin & Coastal Zone Mgt Division'.	√ Sub function of 'Water Hazard Management' & 'Water Resources Technical and Scientific Support'	4.1.1 5.1.2 5.1.5
	Provide technical advice and support, and plan and develop human capacity training in the use of hydrodynamic modeling.	Training-related/HR & technical advice provision.	√ 'Water Resources Technical and Scientific Support'	5.1.6 5.1.7 5.1.8 5.1.1
Division 6	*Dam & Design Division*			
Unit	*Structure Unit*			
Functions	Provide technical advice on the design of water control structures, irrigation pump systems and drainage, hydraulics, and bridge design.		√ 'Water Resources Technical and Scientific Support'	5.1.1
	Identify, assess and repair critical structures for correct functioning and safety, and to carry out design work for civil engineering structures.		√ Sub function of 'Water Hazard Management' & 'Water Resources Technical and Scientific Support'	4.1.5 4.1.6 5.1.3
Unit	*Geotechnic Unit*			

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
Functions	Provide technical advice and review service (including in geotechnics) for design solutions and problem rectification in respect of structure stability (e.g. foundations) in the coastal margins or river locations, such as dam structures, and lee-wall and bridge foundations.		√ Sub function of 'Water Hazard Management'	4.1.5 4.1.6
	Prepare design solutions for river and coastal protection works, slope repair, bridge foundation and DID structures and buildings.	DUPLICATION potential: Department of Works also have a specialist unit doing these functions (PWD). PWD not likely to relinquish any function in this area as it relates to civil engineering projects such as roads and bridges.	√ Sub function of 'Water Hazard Management'	4.1.5 4.1.6
Unit	*Hydraulic Unit*			
Functions	Assess studies and design related to drainage/river systems through modeling, and to provide technical advice for hydraulic design analysis in river basin studies, flood mitigation project and urban drainage systems (inclusive of MASMA).	DUPLICATION potential. Possible duplication with some functions of the' Flood Mgt Division', and 'River Basin Section' of 'River Basin & Coastal Zone Mgt Division'.	√ Sub function of 'Water Hazard Management' & 'Water Resources Technical and Scientific Support'	4.1.5 5.1.1 5.1.5
Unit	*Material Construction Technology Unit*			
Functions	Provide technical support and make available design specifications, guidelines, and advice on the use of construction material technologies.	Function and purpose described.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1 5.1.2
Unit	*Dam Unit*			

A		B	D	E
Current DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Functions	Provide supervision, safety surveillance, inspection, audit and repair of DID operated dam (15 dams), and prepare procedures, standards, and guidelines in relation to dam safety.		√ Sub function of 'Water Hazard Management' & 'Water Resources Sustainable Integrated Mgt' & 'Water Resources Technical and Scientific Support'	2.1.9 4.1.1 4.1.2 4.1.7 5.1.1
Division 7	*Mechanical and Electrical Division*			
Section	*Structure Maintenance and Development Section*			
Functions		Not directly relevant to Water Resources Management Authority Model.	-	
Section	*Asset Management and Development Section*		-	
Functions		Not directly relevant to Water Resources Management Authority Model.	-	
Section	*Planning and Modernisation Section*			
Functions		Not directly relevant to Water Resources Management Authority Model.	-	
Section	*Software System Maintenance and Development Section*			

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
Functions	Implement and manage DID dredger program.	Do they mean manage the software or manage the program of works? Ambiguous.	√ Sub function of 'Water Resources Sustainable Integrated Mgt' & 'Water Hazard Mgt'	2.1.3 4.1.2
	Promote vocational training for skills and competency in mechanical and electrical systems.	Training/capacity.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6 5.1.7 5.1.8
Section	*Mechanical and Electrical Maintenance Section*			
Functions		Not directly relevant to Water Resources Management Authority Model.	-	
Division 8	*Humid Tropics Centre*			
Unit	*Information and Communication Unit*			
Functions	Manage technical documents, and arrange publication of proceeding and research papers.	Note: The function does not identify how broad this units coverage is, e.g. does the function apply across DID?	± Sub function of 'Water Resources Technical and Scientific Support'	5.1.10
Unit	*Implementation & Coordination Unit*			
Functions	Coordinate water resources management-related workshops, seminars, and conference for DID nationally, and participate in relevant international forum.	Same comment as given under the other unit in this section.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6 5.1.8

A		B	D	E
Current DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
	To collect data and conduct instrumentation installation for research activities; and coordinate HTC staff training courses	DUPLICATION potential with 'Water Resources Mgt & Hydrology Division'. Ambiguous: Does the first part of this function (on instrumentation) for the division or for all of DID?	√ Sub function of 'Water Resources Assessment' & 'Water Resources Technical and Scientific Support'	Supports 1.1.1 1.1.7 5.1.7 5.1.8
Division 9	*Quantity Surveying & Contract Administration Division*			
		Mostly internal matters – not directly relevant to Model.	-	
	Project management, oversight/control and review of water resources development and/or management projects, including drainage , erosion control, and flood management works and infrastructure.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.3
Division 10	*Building & Infrastructure Division*			
Functions		None-water resource management related function for this department. Not relevant to current task.	-	
Division 12	*Human Capital Development Division*			
Functions	Assist individual staff in developing core competencies through provision or access to relevant training, exposure to new technology.	Training/capacity building.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6 5.1.7 5.1.8

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
	Provide a competencies assessment program to enhance human capacity and knowledge in water resources management, and to support the purpose of competency-based career progression.	Training/capacity building.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.7
	Manage and guide the operations of the 'National Water Resources Institute', for professionals involved in water resources management, and develop training programs for individuals in water resources management from developing countries.	Institute under DID with multiple campus locations. Believed to be a new.	√ Sub function of 'Water Resources Technical and Scientific Support' & 'Intra-, Inter- and International Technical Water Resources Services'	5.1.6 6.1.4
Division 13	*Management Services Division*			
Functions		Non water-related function for this department. Not relevant to current task.	-	
Division 14	*Corporate Division*			
Section	*Policy Planning Section*			
Functions	Identify and inventory DID-relevant guidelines, ordinances and Acts and other relevant instruments to ensure full implementation of DID mandates are achieved.		-	
	Coordinate and guide the execution of inter and intra-departmental and international working relationships as	Note: Model refers to the international scope,	√, α Sub function of 'Intra-, Inter- and	6.1.4

A Current DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	these pertain to water resources management, and monitor and report on the implication of international trends in water resources management.	whereas the current function also addresses the matter at national inter-departmental/agency levels.	International Technical Water Resources Services'	
	Provide the coordinating mechanisms necessary so as to be the 'Focal Point' regionally and internationally for water resources management.		√ Sub function of 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4
Section	*Resource Centre & Information Section*			
Functions	Coordinate the production of DID publications.	DUPLICATION potential with the Humid Tropics Centre	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.10
	Encourage the need for integrated development; i.e. (i)"river basin information systems", (ii) "Dams management Systems, (iii)"Paddy Management Systems" (iii)"Coastal Information Systems" (v) "Flood Info Systems and Rainfall Data as well as Draught Management Systems.	Important: A broad function related to re-aligning the water resources management paradigm along the lines of current international best practice	α 'Water Resources Sustainable Integrated Mgt'	2.1.1
Section	*Administration & Corporate Affairs Section*			
Functions	Promote through various media public awareness and informational dissemination for enhanced water resources management	Partly internal, but could be utilized as a platform to promote sustainable water management, public awareness building and much more	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.9
Section	*Evaluation & Detection Section*			

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Functions		Internal operational/admin matters	-	
Division 15	*Information Technology Management Division*			
Functions	ICT planning for DID and management of ICT Division: • Development of Divisional and ICT Strategic Plan • Secretariat for various ICT steering committees • Procurement management of hardware, software and ICT services • Enculturation of ICT within DID through training, quality programs etc. • Compliance to ICT procedures and circulars. • Management of divisional administration and finance / expenditure.	Internal operational/admin matter	-	
	Management of ICT operations and technical support: • Data Centre and server management • System and Database administration • Management of e-mail system • Network management • ICT security management • Technical support and helpdesk • Hardware and software inventory management	Mostly internal and administrative. However, the data Centre aspect is of direct relevance to the Model.	√ Sub function of 'Water Resources Assessment'	1.1.7

A **Current DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
	Development and maintenance of application systems: • Development and maintenance of application systems (in-house and outsource) • Application Systems roll out to states/ divisions offices • Development and maintenance of DID Website and Intranet • Development of presentation software and Multimedia. • Support the implementation of Electronic Government Systems.	Internal operational/admin matter	-	
Division 16	*Performance Audit Division*			
		None water-related function for this department. Not relevant to current task.	-	

Table A4.8.4 - Proposed DID Federal Functions by Division/ Section/ Unit

A **Proposed DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Division 1	*Dam & Design Division*	Note: The proposed new functions and sections for this division would lead to expansion of the division.		
Section	*Design Section*			
Unit	*Design Units 1 & 2*			
Functions	Plan, coordinate and implement detailed design work for JPS projects i.e. care and recovery of rivers, development of coastal zone, flood mitigation and town drainage	DUPICATION potential with 'Rivermouth Preservation Unit' of the 'Coastal Section', and the 'River Maintenance Unit' of the 'River Basin Section' both within the 'River Basin & Coastal Zone Mgt Division'	√ Sub function of 'Water Resources Sustainable Integrated Mgt' & 'Water Hazard Mgt'	2.1.3 4.1.5 4.1.6
	Plan, coordinate and implement designs for emergency work like cliff or collapsed structures	Appears to be already a function of this Division.	± Supports sub function of 'Water Hazard Mgt'	4.1.5 4.1.6
	To generate expertise of design and technical in the field of on-going geotechnique, hydraulics, and structures		± Supports sub function of 'Water Resources Technical and Scientific Support'	5.1.6
	To give technical design service during a construction of a project	Very broad function description, and likely already a function of other units, sections or divisions.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1

	A Proposed DID Federal Functions By Division/Section/Unit	B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	Plan, coordinate works of quantity surveying and land investigation for design projects	DUPLICATION potential with the 'Quantity Surveying & Contract Administration Division'	√ Broad support for "Water Resources Sustainable Integrated Mgt'	2
Section	*Technical Service Section*			
Unit	*Consultancy Service Unit*			
Functions	Coordinate and provide expert advice regarding to structure, geotechnical and hydraulics analysis in research and design. - 189 projects on river basins, beach zones and river mouth, - 79 main projects on flood mitigation. - 15 main projects on town drainage		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
	To legislate and update the guidelines and benchmark (*kepiawaian)* for designs of JPS structures.	Complementary function to other divisions so long as they do not duplicate guideline development for flood control and flood plain mgt.	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4.1.5 5.1.1
	To give expert contribution to institutes (e.g. SIRIM, CIDB etc) in the form of summarized/updated practice codes or benchmark for civil engineering.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
Unit	*Environment Engineering Unit*			
Functions	To monitor and audit environmentally sensitive projects		√ Support for sub function of "Water Resources Sustainable Integrated Mgt'	2.1.5

A		B	D	E
Proposed DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
	To ensure the environmental monitoring aspect is complied in the planning, design and construction of JPS projects		√ Broad support for sub function of "Water Resources Sustainable Integrated Mgt'	2
	To become the central reference and technical advisor in environmental engineering related to the departments' function	Suggest: To be the centre of excellence, research, and advice for environmental engineering.	α "Water Resources Technical and Scientific Support'	5.1.1
	To audit and update environmental engineering guidelines and policies related to JPS projects	Note: The guidelines should be developed and used as an industry standard, not just for JPS.	√ Support for sub function of 'Water Resources Sustainable Integrated Mgt' & 'Water Hazard Mgt' & "Water Resources Technical and Scientific Support'	2.1.7 4.1.5 5.1.1
Section	*Technology Management Section*			
Unit	*Material Construction Technology Unit*			
Functions	To identify, study and grade the products, construction material, economical green technology, sustainable and environmentally friendly, added-value, for the usage of construction projects of departments and other agencies under NRE.	An expansion of an existing function under this unit.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1 5.1.2
	To study and implement research works and developments through pioneer projects and experiments for assessment and monitoring performance and suitability as well as the best construction method.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2

A		B	D	E
Proposed DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Unit	*Dam Safety Monitoring and System/Data Management Unit*	The new proposed functions generally only relate to the 15 dam structure under control of DID, and are not directly relevant to the model *per say*. Only a select few are mentioned here in context of the Model.		
Functions	To carry out the monitoring works of hydro isotopes and water chemistry for 15 JPS dams and identify the potential for defects to be repaired.	Note: This should apply to all dams, or at least be an aspect that DID overseas at national level.	√ Sun function of 'Water Resources Assessment'	1.2.2
	To carry out the works of sediment monitoring for the 15 JPs dams and report of dams to the identify the action needed suitable preventive/repair works.	Function fits but purpose varies to that of the Model, where focus is on water resource mgt.		1.2.2
	To study safety monitoring reports on 74 dams in Malaysia for the safety status report to the National Safety Council during flood crisis.		√ Sub function of 'Water Hazard Mgt'	4.1.4
	Involvement in collaboration activities of JPS-MACRES at national level as well as the application of remote sensing techniques in Dam Safety Monitoring activities.		√ Supports sub function of 'Water Hazard Mgt' & 'Intra-, Inter- and International Technical Water Resources Services'	4.1.1 6.1.5
	Development and maintenance of Dam GIS, and development and management of remote sensing in catchment area.	Strong DUPLICATION potential with current function of the 'Risk Mgt Unit' within the Flood Mgt Division'	√ Supports sub function of 'Water Resources Sustainable Integrated Mgt', 'Water Hazard Mgt' & 'Water Resources	2.1.7 4.1.1 5.1.2

A Proposed DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
			Technical and Scientific Support'	
Unit	*Dam Safety Check Unit*	Most functions are internal or administrative.		
Functions	Conduct or oversee Safety Check Reports on a dam after an emergency crisis such as a big flood and identify the potential of defects to be repaired.		± Supports sub function of 'Water Hazard Mgt'	4.1.1
	Evaluate safety check reports or all 74 dams in the whole of Malaysia and report on the safety status of the dams that are related to the National Safety Council during the crisis of flood.		± Supports sub function of 'Water Hazard Mgt'	4.1.4
Unit	*Development and Repair Unit*	Internal or dam safety-related functions. Potential duplication with Dam Safety Check Unit.		
Division 2	*Flood Management Division*	Re-organisation into geographically-based administrative units. Generally resulting in no new functions as such. New function of this division are provided below.		
Section	*Detection and Evaluation Section*			
Unit	*Post Flood Unit*			
Functions	To plan, carry out, coordinate and monitor flood loss evaluation program, and manage flood impact information system.		± Supports sub function of 'Water Hazard Mgt'	4.1.1

A Proposed DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	To plan, implement and coordinate the Flood Management Infrastructure Repair Program after the flood.			4.1.4
Unit	*Asset Management Unit*		± Supports sub function of 'Water Hazard Mgt'	
Functions	To plan, implement, coordinate, monitor and evaluate the Flood Infrastructure Asset Management, and audit flood mitigation physical aspects.			
Division 3	*Humid Tropics Centre*	The primary outcome for the HTC if re-organisation occurs as requested, is that the HTC be based on developing Sections with broadened purpose and function, instead of the current situation where it is comprised of two small Units. DUPLICATION potential: certain proposed functions either appear to be duplication between the 'Research & Development Section' and 'Implementation and Coordination Section'. In some instances some functions could be moved between each of these for enhanced outcomes.		
Section	*Research and Development Section*			

A **Proposed DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Functions	To develop the cooperative research mechanism between UNESCO Water Centre Category II and water managers in Malaysia (including identify and describing local capacity and necessary capacity-building) as well as identifying areas of common interest and synergy and providing the capacity matrix, and undertake multi-disciplinary research for the International Hydrological Program.		√ Supports sub function of 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4
	To identify the latest technology that can be pioneered and developed in the field of hydrology and water resource management and promote commercialisation of technology.	DUPLICATION with current functions of the 'Hydrology Instrumentation Section' of 'Water Resources Mgt and Hydrology Division', and more broadly with this division as a whole.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2
	To carry out the human development in the field of Water Education for the steady development of the South East Asia and Pacific region as well as Malaysia.	DUPLICATION potential with other divisions, in particular with the 'Human Capital Development Division'. However, if focused not on technical training or education such as Public Water Resources Education, then this function is unique to this proposed section.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6 5.1.9
Section	*Implementation and Coordination Section*			

A		B	D	E
Proposed DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Functions	To join expertise with other UNESCO Water Centres in carrying out the SWITCH Asia Project: An Integrated and Innovative Program Towards Sustainable Water Management in Asia's City of Future under the management of UNESCO IHE.	DUPLICATION potential with the 'Research and Development Section' of HTC another newly proposed Section also.	√ Supports sub function of 'Intra-, Inter- and International Technical Water Resources Services'	6.14
	To combine the expertise of other UNESCO Water Centres and carry out the joint venture project "Regional Consultation on Water Education and Training in Asia-Development of a Strategic Framework (Education).	As above.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.9
Section	*Information and Communications Sections*	Many proposed functions are not directly relevant to the Model. Only immediately relevant functions are captured in this table.		
Functions	To form a network of expertise with research agencies in the field of hydrology and water resource, globally, regionally and locally. Also to promote cooperative research.	DUPLICATION potential.	√ Supports sub function of 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4
	Analyse and evaluate the 'Data Archive AP FRIEND' system from time to time to ensure the sharing of "River Catalogue' information is effective and fulfil the requirements of the customers globally, regionally and locally.	Although seeming to be a concisely described function, this function is vague.	?	
	Development, study, evaluate and repair the database information technical system in the field of hydrology	DUPLICATION with current functions of the 'Water Resources Mgt and	√ Sub function of 'Water Resources	1.1.7

A Proposed DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	and water resource so that it is easily accessible and fulfil the wants of the customer.	Hydrology Division.	Assessment'	
Division 4	*Mechanical and Electrical Division*	Note: Many of the new proposed functions of this division are not directly relevant to the scope of this analysis.		
Section	*Specialist and Research M&E Section*			
Functions	To determine the specification of drainage infrastructure equipments and water resource hydro mechanicals.		√ Sub function of 'Water Hazard Mgt'	4.1.3 4.1.5
Section	*Modernisation and Maintenance Section*			
Functions	To manage and administer the equipment modernisation of hydro mechanical water resource and mechanical drainage infrastructure programs.		√ Sub function of 'Water Hazard Mgt'& 'Water Resources Technical and Scientific Support'	4.1.5 4.1.6 5.1.2
Section	*Electrical Section*			
Functions	To carry out the modernisation of electrical system for water management.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2
Division 5	*Water Resources Management & Hydrology Division*	Many of the proposed functions of this division tend to overlap or duplicate functions currently undertaken by other existing divisions within the current DID Federal institutional structure.		

A **Proposed DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
Section	*Water Resource Development Section*	Note: This Section is a proposed new section where existing sections would need to be re-organised.		
Unit	*Water Resource Management and International Relations Unit*			
Functions	Develop an integrated management policy for water resource management; and implement, coordinate and monitor IWRM policies, law, training, study, integration and planning for the whole of Malaysia.	Important Note: This important proposed functional area is not directly a part of any divisions' current functions, and is not duplicated by any other proposed new functions.	√ Supports sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.10
	To plan and implement at least one IWRM flagship program which develops, tests and promotes 'Best Management Practices' (BMPs) to ensure effectiveness prior to roll-out of a national program.		√ Supports sub function of 'Water Resources Sustainable Integrated Mgt'	2.1.10
	As an international relations secretariat under the program of "Malaysia International Hydrological Program-MIHP – UNESCO, and World Meteorological Congress and WWD.	DUPLICATION potential with current functions of other divisions. However, if offering a single-point contact to help other divisions in program coordination, then the function may promote integrated international program management. Alternatively, this might be a function (i.e. act as secretariat)	√ Supports sub function of 'Intra-, Inter- and International Technical Water Resources Services'	6.1.4

A **Proposed DID Federal Functions By Division/Section/Unit**		B **Notes/ Comments on Gaps or Duplication**	D **Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	E **Cross Ref Function from Model (ID)**
		that another division such as Corporate should consider.		
	To plan, coordinate and monitor the capacity building program in water resource management to ensure a sustainable development.	DUPLICATION potential with many existing sections and proposed section/units, i.e. Human Capital Development Division.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6
Unit	*Design and Assessment of Water Resources Unit*			
Functions	To draft, coordinate, develop and circulate hydrology procedures, hydrology guideline and hydrology design procedure for the use of departments, government agencies, consultants and universities.	DUPLICATION with many other division's current and proposed functions.	√ Sub function of 'Water Resources Assessment' & 'Water Resources Technical and Scientific Support'	Supports 1.1.7 5.1.1
	To plan, and coordinate the publishing processes of Water Resources Publication including the findings of implemented study.	DUPLICATION with at least six other Section/Divisions current functions.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.10
	To carry out surface hydrology analysis and sub-surface for the assessment and evaluation of national water resource.	Important note: The most clearly articulated description of this function specifically related to this sub-set function of the Model.	√ Sub function of 'Water Resources Assessment'	1.1.1
	To carry out advice service in design, analysis and hydrology modeling for drainage structure, irrigation , water resource and flood mitigation to all main JPS function , government agencies and consultants.	DUPLICATION with many other divisions current functions.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1 5.1.5

A Proposed DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
	To carry out the drought monitoring program(40 stations) in the country and monitor draught thru the info-draught website (http://infokemarau.water.gov.my)	Refinement of a current function undertaken by this division.	√ Sub function of 'Water Hazard Mgt'	4.1.9
Section	*Hydrology Monitoring and Predictions Section*			
Unit	*Flood Monitoring Unit*			
Functions	Committee member of management and disaster relief centre chaired by the Deputy Prime Minister.		√ Supports sub function of 'Intra-, Inter- and International Technical Water Resources Services'	6.1.5
	To coordinate and carry out the state flood operation program.	DUPLICATION with the current functions of the 'Flood Mgt Division'	√ Sub function of 'Water Hazard Mgt'	4.1.1
	To implement flood prediction model in all main river basins in the country using the Integrated Atmospheric and Radar Satellite Model-Based Rainfall and Flood Forecasting System with 72 hours follow-up.	Refined description of an existing function.	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4 5.1.2
	To coordinate and operate the early warning and prediction centre for floods-24 hours.	Refined description of an existing function.	√ Sub function of 'Water Hazard Mgt'	4
	To analyze and evaluate real time hydrology data from the existing telemetry station and 1225 new stations in the country thru website for flood info.	Expansion of a current function under the same division.	√ Sub function of 'Water Hazard Mgt'	4
	To develop and prepare a database for flood, flood maps, risk flood maps for the country.	DUPLICATION potential with Flood Mgt Division.	√ Sub function of 'Water Hazard Mgt'	4.1.1
Unit	*Prediction Model Unit*	DUPLICATION of most proposed		

A Proposed DID Federal Functions By Division/Section/Unit		B Notes/ Comments on Gaps or Duplication	D Function Match with Model Components √=Yes -=No ±=Partial α=Suggested Additional Related Main Function (1-6)	E Cross Ref Function from Model (ID)
		functions against existing functions found in other divisions of DID Federal		
Functions	To plan, manage and develop the prediction modeling and flood warning in main river basins in the country using hydrology model.	DUPLICATION with Flood Mgt Division current functions.	√ Sub function of 'Water Hazard Mgt' & 'Water Resources Technical and Scientific Support'	4.1.1 5.1.5
	To plan and develop latest model of flood prediction that is the Integrated Atmospheric and Radar Satellite Model based Rainfall and Flood Forecasting in the country.	Some DUPLICATION potential with Flood Mgt Division current functions.	√ Sub function of ' 'Water Resources Technical and Scientific Support'	5.1.5
	To plan, manage and implement development and capacity control system and signal for flood danger like telemetry stations, sirens, and web-cam.	Some DUPLICATION potential with Flood Mgt Division current functions.	√ Sub function of 'Water Hazard Mgt'	4.1.2
	To assess and evaluate extreme climate change and prepare the design for extreme hydrology.	Refinement of a current function undertaken by this division.	√ Sub function of 'Water Hazard Mgt'	4.1.9
	Operate a Drought Mitigation Centre.		√ Sub function of 'Water Hazard Mgt'	4.1.9
	To plan and implement prediction water inflow from dam model including the preparation of latest information of dam water level.	Ambiguous	?	
	To plan and implement drought prediction system and water resource prediction as well as low flow study for the need of domestic water, irrigation and agriculture.		√ Sub function of 'Water Hazard Mgt'	4.1.9
	To plan and implement monitoring and predicting mud		√	4.1.5

A		B	D	E
Proposed DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
	flood and land slide in strategic areas.		Sub function of 'Water Hazard Mgt'	
	To develop debris and mud flow flood map.		√ Sub function of 'Water Hazard Mgt'	4.1.5
Section	*Operation and Hydrology Information Section*			
Unit	*Hydrology Information and GIS Unit*			
Functions	To plan and manage the river index using the water quality data from other observed JPS stations.	An activity-specific function	√ Sub function within 'Water Resources Assessment' & 'Water Resources Sustainable Integrated Mgt'	1.2 2.1.1
	To plan, manage and implement station inventory online and provide hydrology information using GIS.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.5
Unit	*Operation Hydrology Unit*			
Functions	To plan and implement management and hydrology data quality system thru MS ISO 9001:2008.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2
	To plan and implement standard certainty for data quality and hydrology information.	Data quality control	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
	To explore alternative observation methods to obtain hydrology information, including the remote sensing technology.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2
Section	*Hydrology Equipment and Instrumentation Section*			

A		B	D	E
Proposed DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
Unit	*Planning, design and Development of Instrumentation Systems (UPRP) Unit*			
Functions				
	To plan, design, develop and provide a standard protocol and standard specification for the development of telemetry system and communication system.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
	To plan, design, manage, implement and monitor development and fixing of equipment for the hydrology network that involves 800 manual stations that need to be upgraded to automatic stations online.	Expansion of an existing function within this same division.	√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.2
	To plan, manage and carry out training programs and hydrology equipment for all states.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.6 5.1.7
	To draft and develop technical guidelines for hydrology equipment for the purpose of standardization inclusive of testing, controlling and approving the electrical-electronic equipments for the project to be carried out.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
	To implement the service of technical specialist of hydrology equipment to other departments and government agencies.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1
Unit	*Observation and Network Instrumentation Unit*			
Functions	To coordinate, identify and prepare the daily telemetry report for all the telemetry stations in the country thru		√ Sub function of 'Water Hazard Mgt'	4.1.2

A		B	D	E
Proposed DID Federal Functions By Division/Section/Unit		**Notes/ Comments on Gaps or Duplication**	**Function Match with Model Components** √=Yes -=No ±=Partial α=Suggested Additional **Related Main Function (1-6)**	**Cross Ref Function from Model (ID)**
	the InfoBanjir website and master station in state and carry out troubleshooting to ensure the equipment performance is in good condition.			
	To provide experts at ad-hoc according to the request are to solve state problem of equipments.		√ Sub function of 'Water Resources Technical and Scientific Support'	5.1.1

Table A4.8.5 - Directions of Functional Adjustments and Re-alignment

Group	Core Areas	Status	Actions
1	(a) Water Hazard Management (b) Water Resources Technical and Scientific Support	Well entrenched and are strong DID functions.	Need only strengthening and consolidation of functions.
2	(c) Water Resources Assessment (d) Water Resources Integrated Sustainable Management (e) Intra-, Inter- and International Technical Water Resources Services	DID partially performing these functions.	Need to widen and increase the functional capacity to accommodate the functions not currently carried out by DID's set-up.
3	(f) Water Resources Allocation and Regulation	DID performing very modest functions in this core area.	Need to build up the capacity of DID to perform these functions such as in the preparation of regulatory guidelines and standards for water resource allocations and prioritisation in the abstraction of water in the river basins.

A4.8.2.5Recommendations to Meet the Needs of the Water Resources Sector

(i) The recommendations below have been developed on the basis that DID would be the agency placed in charge of water resources management and it will eventually be the NWRD with water resources functions. In order to meet the needs of water resources functions as in the ideal WRF Model and international best practices, DID will have to begin the transforming process immediately. The transformation process will need to be undertaken over a period of time suitable so as not to disrupt the current operations and functioning of DID. The process should be guided by strategic planning focusing on capacity enhancement and inculcation of a modern and progressive water resource management paradigm.

(ii) The recommendations below are not listed in any particular order of hierarchy or importance. The recommendations are in the functional areas where DID can adopt to adjust and re-align wherever relevant and necessary to be in a position to take on the water resource functions.

(a) **Dedicated Team**: Re-align DID to focus on each of the six main functional areas of the WRF Model. To do this, a small dedicated team will have to be formed first in DID to carry out this exercise. The dedicated team will be put in charge of meeting all the requirements of specific relevant main functions and it will have to work in close collaboration with and between divisions, as some functions can only be done with the provisions of information, expertise

and data from the divisions if re-organised along the lines of the WRF Model's six main function areas.

(b) **Institutional reforms:** Currently, the Federal DID has line agencies in each of the States, including the Federal Territories. This has enabled it to play a significant role in the management of water resources at the Federal level. At the State level, the State DID assumes the responsibility of undertaking the technical management and operations of water resources programs and projects, most of which are entrusted on it by the Federal DID. As shown in the proposed institutional arrangements, the lines agencies are being retained as they are important States agencies that will have to carry out the Federal DID obligations at the State level. They may also have to change their name to SWRD to reflect the new role and functions along the lines of NWRD. The DID will have to sensitize these line agencies on the new developments in the reforms in the water resource sector that has been carried through to the State level, so they are aware of and need perhaps to re-align their functions to take on the additional functions in line with the Federal DID.

(c) Empowerment: Empower the NWRD to be able to regulate (even if only through indirect regulation by control of data and information or planning) any and all activities/structures/works that have an effect on water resources management (perhaps undertaken by line state-based equivalent agencies). Complementary to this, is the setting of national standards, guidelines, and procedures (in documented form) in relation to various aspects of water resources management, e.g. drainage and irrigation, hazard mitigation works/structures, hydrological and other data collection, and analysis and modeling etc. This can an important function of the NWRD.

(d) **Need for unifying objectives and goals:** DID current and proposed function descriptions are often prescribed at a micro-level, and once considered as a whole, often remain unable to match perfectly the number of functions prescribed within the WRF Model for a water resources management department. This is understandable in the context that DID's main past role was for drainage and irrigation. This issue is likely to be further complicated by the unique functions and activity programs undertaken by DID divisions perhaps within a vacuum. Essential to achieving a unified program for water resources management is the need for a unifying purpose and goal for DID, in this context, it is necessary for DID to immediately change the name to NWRD, and to use a central them such as *sustainable and integrated water resources management* or *conservation of water resources* as recommended in the water resources policy. The actions needed will be to instill the vision and mission statements more clearly with the accompanying policies and legislation that provides the unifying objectives of DID and later the NWRD.

(e) **Actions to avert Functions duplication:** the DID will have to determine the actions to be taken in terms of functions duplication prior to the re-alignment exercise. Duplication of functions both *within* and *between* DID divisions and sections is evident and the primary areas where duplication of function is highest have been highlighted in **Table A4.8.3** and **Table A4.8.4** and accompanied by explanatory notes/comments for consideration or correction. The issue of ambiguity in relation to function descriptions is also distinguishable, leaving concern over the clarity of purpose and roles of some groups (divisions, sections or units). In some instances, functions and activities that appear to be duplications may not be when interpreted in the context of the section or division that the function is undertaken (in such cases these are cited as potential duplication), e.g. GIS, where there may seem to be strong duplication between units/section/divisions; however, when assessed in context, the intent of each group's GIS functions appear to encompass (or relate to) a specific environment, e.g. Coastal, rivermouth or river basin (thematic). The DID will have to examine all these in the context of their water resources functions and to enhance programs, activities and functions between divisions so as to reduce and eventually remove all functions duplication, resulting in maximizing resource use and clearer delineation of role and purpose between and within divisions.

(f) **Actions on Duplication of unit name and functions:** Two divisions within Federal DID both contain a 'hydrodynamics unit', i.e. *The Flood Management Division* and the R*iver Basin & Coastal Zone Management Division.* At first encounter, there also appears to be some duplication of functions although the functions may well be division-activity focused (e.g. thematic). Nevertheless, it would be reasonable to expect a fair level of collaboration and data-sharing between the two units, so as to make best use of the data held by each. Furthermore, the *Modeling Unit* in the *Coastal Section* also appears to duplicate some functions of one of the *Hydrodynamics Units* or both. In both cases, there is a need for actions to either change the name or to rationalize the functional operations in the units, or to merge the units.

(g) **Actions on Duplication potential from proposed new functions in the recent re-organisation exercise:** A number of proposed new functions under new sections or units within the '*Water Resources Management & Hydrology Division*' overlap and/or duplicate a large number of water resources management functions currently prescribed within other DID divisions. If the proposed re-organisation for '*Water Resources Management & Hydrology Division*; is imminent, there is a need at the Federal DID level, for a re-alignment of the other divisions and their functions as well. The divisions most affected by potential duplication (if Federal DID is going for full re-organisation) are the '*Flood Management Division*' and '*River Basin & Coastal Zone Management Division'*. Actions will have to be taken to avert any potential residual duplication of functions.

(h) **Enhance co-ordination:** An area of duplication is in compilation or development of guidelines, standards and procedures. A comparison between current and proposed functions highlighted that some divisions are developing and or overseeing development/review of guidelines, which in some instances are division specific, while in other instances, clear duplication of activities. This is an area where co-ordination is very important and necessary to avoid all forms of duplications in the field of information and data collection. As the NWRD will be a repository or databank, it will need to have complete control of the data and information and to do this, co-ordination in data and information collection functions is absolutely necessary.

(i) **Scope of DID guidelines or standards for structures:** Inherent within the description of current and proposed functions of DID, there appears to be a need for wider application and use of DID guidelines and standards. The use of these seems to be limited to structures etc under the control of DID. For effective and efficient outcomes particularly for water hazard management such guidelines and standards, should also be applied to activities and structures not under the control of DID. A specific case in point, is where flood management structures on private land are not required to be regulated (directly or indirectly) or approved by DID. Often at State level, the local DID has no way to ensure that privately constructed flood management structures (or other structures of interest) meet best engineering practice standards. A likely outcome of such an uneven approach is that flood mitigation around some towns may either require far more expenditure or be rendered ineffective if adjacent structures are poorly constructed. All these details and scope of work within DID will have to be sorted out first in the transformation process.

(j) **Capacity development**: A capacity development program that incorporates training both at the formal and informal level will be necessary to fill the various gaps in ability to meet relevant and important aspects of the WRF Model. The capacity development programs will need to recognize the need for a multi-disciplinary team of experts and technologists covering all aspects of sciences related to water for efficient and effective water resources management. It will need a lot of manpower with expertise and skills to use and apply integrated planning mechanisms such as the IRBM or IWRM as guiding frameworks in which water resources management takes place. The skills and expert knowledge will also be needed to develop legislative and institutional mechanisms to finalize IWRM plans including IRBM and ISMP, national strategic water resources indicators, water resources audits, etc some of which are to be incorporated into the structure and local plans, Malaysian Development Plans, Mid-term Review Plans etc, whilst also making legal provisions for reasonable consultative processes during the development of such planning instruments.

(k) **Research:** A dedicated research division either developed within NWRD or bought into the NWRD to meet research needs (including applied research) of the department will be necessary to support the work to be carried out. Alternatively, align an existing research agency or agencies focused on water-related research to meet the research needs of NWRD, without making it fully accountable to the authority (this would allow the said agency or agencies to maintain some autonomy).

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