

CONSUMER ASPECTS OF WATER DEMAND MANAGEMENT MEASURES FOR EFFECTIVE WATER RESOURCES MANAGEMENT IN MALAYSIA

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AGENDA

- INTRODUCTION**
- WHAT IS THE PROBLEM WITH THE CURRENT APPROACH OF WATER SUPPLY MANAGEMENT?**
- WHAT IS WATER DEMAND MANAGEMENT?**
- WATER DEMAND MANAGEMENT MEASURES IN INDUSTRY**
- CONSUMER ASPECTS OF WATER DEMAND MANAGEMENT – DOMESTIC & HOTEL**
- CONCLUSION.**

FIGHT OVER WATER - WAR OF THE 21ST CENTURY?



INDIA & BANGLADESH ARE IN DISPUTE OVER THE WATERS OF THE GANGES

WATER CRISIS THE WORLD OVER



The Water Crisis in Asia

WATERKWA

What's Happening?

◆ A water crisis is in the making in the cities of Asia. Some 1.2 billion people - nearly one out of every three in the developing world - do not have access to a safe and reliable supply of water for their daily needs.

◆ Signs of water stress abound. Existing patterns and levels of water consumption are just not sustainable.

◆ New and integrated approaches to water resources will have to be formulated to overcome inefficiency, increase in demand, public health concerns and inaccessibility, while at the same time taking care to conserve the environment.

◆ WaterWatch Asia is responding to this challenge by supporting advocacy and networking initiatives among civil society groups engaged in water issues.

Over-pumping has caused land to subside beneath Bangkok at a rate of 5-10 cms a year for the past two decades. Shanghai, China's most populous city, has been sinking at the rate of 10 mm annually since the mid-1980s, due to over-use of groundwater and large-scale construction projects. Water scarcity is particularly severe in and around Beijing where water tables have been dropping 1-2 meters a year, and a third of its wells have reportedly gone dry.

Both the quantity and quality of available freshwater are decreasing in most Asian cities, and this can only aggravate the existing disparity between supply and demand.

Quantity

Water tables are falling, lakes are shrinking and wetlands are disappearing. The acuteness of water shortage is evident in many cities. A growing scarcity of fresh water is now a major impediment to food production, and threatens the survival of ecosystems, general health, social stability and peace among nations.

Population, urban and industrial growth puts tremendous pressure on water resources. In most cities with booming construction, industry and leisure sectors, diminishing water resources are stretched to the limits by the multiple demands for freshwater.

Why Water is the Most Valuable Resource

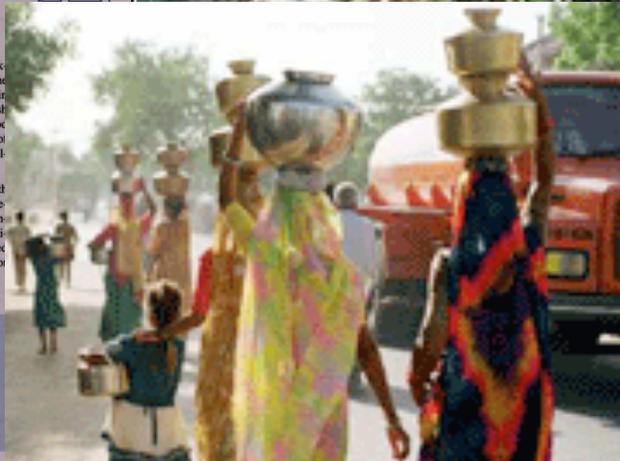
- ◆ A large part of our blue planet is water
- ◆ Only about 2.5 percent of all the water on earth is fresh and two-thirds of this is locked in glaciers and ice caps
- ◆ Freshwater, though renewable, is finite

Water Stressed Cities

By the year 2000 there will be 13 mega cities in Asia each with a population in excess of 10 million. Currently, nearly a third of Asia's population lives in cities, but within 35 years, the majority of Asians are expected to become city dwellers.

As urban populations grow, increasing levels of urban affluence, industrial and domestic consumption will exact an enormous toll on water resources.

In order to overcome water shortages, some cities in Asia have resorted to withdrawal of groundwater. As a result, significant overdraft has occurred in and around Bangkok, Manila, and Jakarta.



Part 4

March of the desert

A shepherd leads his flock across a dried-up river bed in northern China's Shanxi province

AFP file

The World Water Commission for the 21st Century warns:

- 1.4 billion people live without clean drinking water;**
- 2.3 billion people lack adequate sanitation;**
- 7 million people die yearly from diseases linked to water;**
- Half the world's rivers and lakes are seriously polluted;**
- Rivers like the Hwang Ho & Colorado do not reach the sea for much of the year because of upstream withdrawals;**
- Food shortages could create millions of environmental refugees**
- Currently, nearly 450 million people in 29 countries face water shortage problems**
- 20 % more water is needed than is available to feed the additional 3 billion people who will be alive by 2025**
- By 2050, 2.5 billion people would face water stress.**



Despite being blessed with abundant rainfall (3000 mm/year), water problems are increasing & pose a serious threat to people & economy

EXAMPLES OF WATER DISASTERS (DROUGHTS/WATER STRESS/WATER CRISES) IN MALAYSIA – SIGNS OF UNSUSTAINABLE DEVELOPMENT?

SEPANG – FEB 2000



THE 1997/98 EL NINO BROUGHT ABOUT A PROLONGED DROUGHT THAT PRECIPITATED INTO A WATER CRISIS IN A COUNTRY WHERE THE AVERAGE ANNUAL RAINFALL IS MORE THAN 3000 MM!

KEDAH-PERLIS 1977/78



DURIAN TUNGGAL FEB 1991 & 2002



DESPITE PLENTIFUL RAINFALL, MALAYSIA IS PLAGUED BY NUMEROUS WATER PROBLEMS

- (1) MISCONCEPTION ON AMOUNT OF AVAILABLE WATER**
- (2) SINGLE APPROACH OF SUPPLY MANAGEMENT**
- (3) DESTRUCTION OF HIGHLANDS, FORESTS & WATER CATCHMENTS**
- (4) WATER POLLUTION**
- (5) LOST WATER THROUGH NON-REVENUE WATER (NRW)**
- (6) WATER WASTAGE**
- (7) PRIVATISATION OF THE WATER INDUSTRY**
- (8) LOW WATER TARIFFS**
- (9) INSTITUTIONAL & ENFORCEMENT ISSUES**
- (10) CLIMATE CHANGE**

**THE “WATER SUPPLY MANAGEMENT” APPROACH IS
LARGELY DUE TO THE MISCONCEPTION ON THE AMOUNT
OF AVAILABLE WATER: “WATER IS A RENEWABLE
RESOURCE VIA THE HYDROLOGICAL CYCLE”**

- **ANNUAL RAINFALL**

- **3,000 mm**

- **> 150 RIVER SYSTEMS**

- **990 billion m³ (bcm)**

- **SURFACE FLOW**

- **566 bcm**

- **GROUNDWATER**

- **64 bcm**

CURRENT ANNUAL WATER DEMAND IN MALAYSIA (2000)

= 9,543MLD (< 3% SURFACE FLOW)

**WATER SUPPLY MANAGEMENT CANNOT WORK BECAUSE
WHILE WATER SUPPLY IS FINITE, WATER DEMAND IS
INFINITE**

- NUMBER OF DAMS & TREATMENT PLANTS THAT CAN BE BUILT IS LIMITED, BUT POPULATION EXPLOSION IS NOT**
- MANY RIVER BASINS HAVE REACHED THEIR LIMITS OF MAXIMUM SUPPLY (JPS: 25 river basins currently experiencing water stress & has reached their maximum supply capacities)**
- DEMAND “DOUBLES” EVERY 2 DECADES BUT SUPPLY LAGS FAR BEHIND**
- 2007 – SELANGOR IS ESTIMATED TO EXPERIENCE WATER STRESS**
- 2010 – PENANG, MELAKA, NEGRI SEMBILAN & PERLIS ARE EXPECTED TO HAVE INSUFFICIENT WATER.**

TABLE 1: POPULATION BY STATES IN MALAYSIA, 1990 - 2005

STATE	1990	1995	2000	2005	AV. ANN. GROW. RATE		
					1991-2005	JOHOR	
	(IN THOUSANDS)					()	
MELAKA	532	600	634	681		1.7	
NEGERI SEMBILAN	714	804	859	908		1.6	
PERAK	1981	2036	2110	2182		0.7	
PULAU PINANG	1115	1179	1308	1452	Rough Projections based on Annual 2.5% Increase	1.8	
SELANGOR	2331	3210	4175	5069		5.3	
KUALA LUMPUR	1214	1239	1370	1581		1.8	
KEDAH	1358	1501	1652	1791		1.8	
KELANTAN	1184	1286	1315	1348		0.9	
PAHANG	1058	1200	1290	1365		1.7	
PERLIS	187	197	205	213		0.9	
SABAH	1818	2267	2656	3113		2.03=45m	2.0
SARAWAK	1700	1908	2072	2300		2.04=50m	2.0
TERENGGANU	790	835	899	1013		1.7	1.7
MORE DEVELOPED STATES	10007	11490	13177	14893	2.7	2.7	
LESS DEVELOPED STATES	8095	9194	10089	11143		2.2	
MALAYSIA	18102	20684	23266	26036		2.5	

TABLE 2: PROJECTED TOTAL WATER DEMAND FOR DOMESTIC, INDUSTRIAL AND AGRICULTURE IN MALAYSIA 2000 – 2050

YEAR	DOMESTIC INDUSTRIAL DEMAND ^x	AGRICULTURAL DEMAND ^y	TOTAL WATER DEMAND ^y	ANNUAL INCREASE ^x	INCREASE OVER 2000 ^y
2000	9,549	20,094	29,697	-	-
2010	15,285	32,184	47,469	6.0	60
2020	20,388	42,929	63,316	3.3	114
2030	24,285	51,134	75,419	3.0	154
2040	28,181	59,338	87,519	1.5	195
2050	31,628	66,596	98,224	1.2	231

^x ESTIMATE BY MALAYSIA WATER INDUSTRY GUIDE 2003 (THE MALAYSIAN WATER ASSOCIATION, 2003:69)

^y OUR ESTIMATES.

**AS A RESULT OF POPULATION INCREASE,
TOTAL WATER DEMAND WOULD INCREASE
PROPORTIONATELY.**

UNFORTUNATELY, WATER SUPPLY CANNOT KEEP UP WITH WATER DEMAND.

JPS: 25 river basins are already experiencing water stress & has reached their maximum supply capacities:

Sg. Kelantan, Sg. Perlis, Sg. Langkawi, Sg. Kedah, Sg. Merbok, Sg. Muda, Sg. Prai, Sg. Penning, Sg. Kerian, Sg. Kurau, Sg. Bernam, Sg. Tenggi, Sg. Selangor, Sg. Klang, Sg. Langat, Sg. Malacca, Sg. Kesang, Sg. Muar, Sg. Pontian Kecil, Sg. Johor, Sg. Tawau, Sg. Wariu, Sg. Moyog, Sg. Papar and Sg. Miri

Many more rivers are set to follow as more & more dams are built & greater volumes of water are abstracted.

HENCE, IT IS IMPERATIVE THAT WE MOVE AWAY FROM A SINGLE APPROACH OF WSM TO A MORE COMPREHENSIVE APPROACH, INCORPORATING WATER DEMAND MANAGEMENT

WHAT IS WATER DEMAND MANAGEMENT?

**ONE DOES NOT NEED TO GO TO THE EXTENT OF MR GOH
IN ORDER TO PRACTISE WATER DEMAND MANAGEMENT**

*** WDM is simply managing/controlling our water demand or water consumption**

*** WDM can be implemented by Industry, Businesses, Schools, Universities, Government Departments (e.g. Putra Jaya), NGOs, Private Homes & Individuals**

*** WDM has shown to be highly effective in the UK, Japan, Australia, Sweden, Denmark, Palestinian Countries, Singapore etc.**

Demand management development

Depends on:

- **Information available**
- **Technology for data collection / analysis**
- **Technical / economic / methodology**
- **Political / institutional / framework**
- **Involvement & Empowerment of People/all**

Stakeholders

Demand management development

- **Information available & quality**
- **Technology for data collection / analysis and communication**
- **Technical / economic / social & environmental methodology**
- **Political / institutional / stakeholder framework**
- **Marketing, education & communications**

Political & institutional frameworks are needed

Water Framework Directive –
water use analysis,
Sustainable water management

Water Conservation –
Government Action

A Good Deal for Water

Water Bill - Duties to Conserve

Benchmarking of
Privatisation of the
Water Sector

Role of JPS,
DOE &
Information
Ministry

Johannesburg
Summit

Water Sector Competition

Water Saving
Trust

Water Watch & WaterSave
Networks (NGOs)

Federalisation
of the Water
Sector

Academic input through IRPA R & D
& Universities

Encouraging Sustainable
communities

WDM involves Marketing, Education & Communication

**Waste
Watchers
awards**

**Water
Efficiency
Awards**

**Water in the
school
Envirowise
water pages**

**Demand management course – Malaysian
Water Association?**

**Water Seminars &
Leakage
Conferences**

**Conserving
Water in
Buildings**

**MWA's Water
Efficiency
Awards**

**WaterWatch
Network**

**Siti Nurhaliza
Nationwide
Water Concert**

**WaterSave
Network**

**Demand
Management
Bulletin**

**Saving Water on
the Right Track**

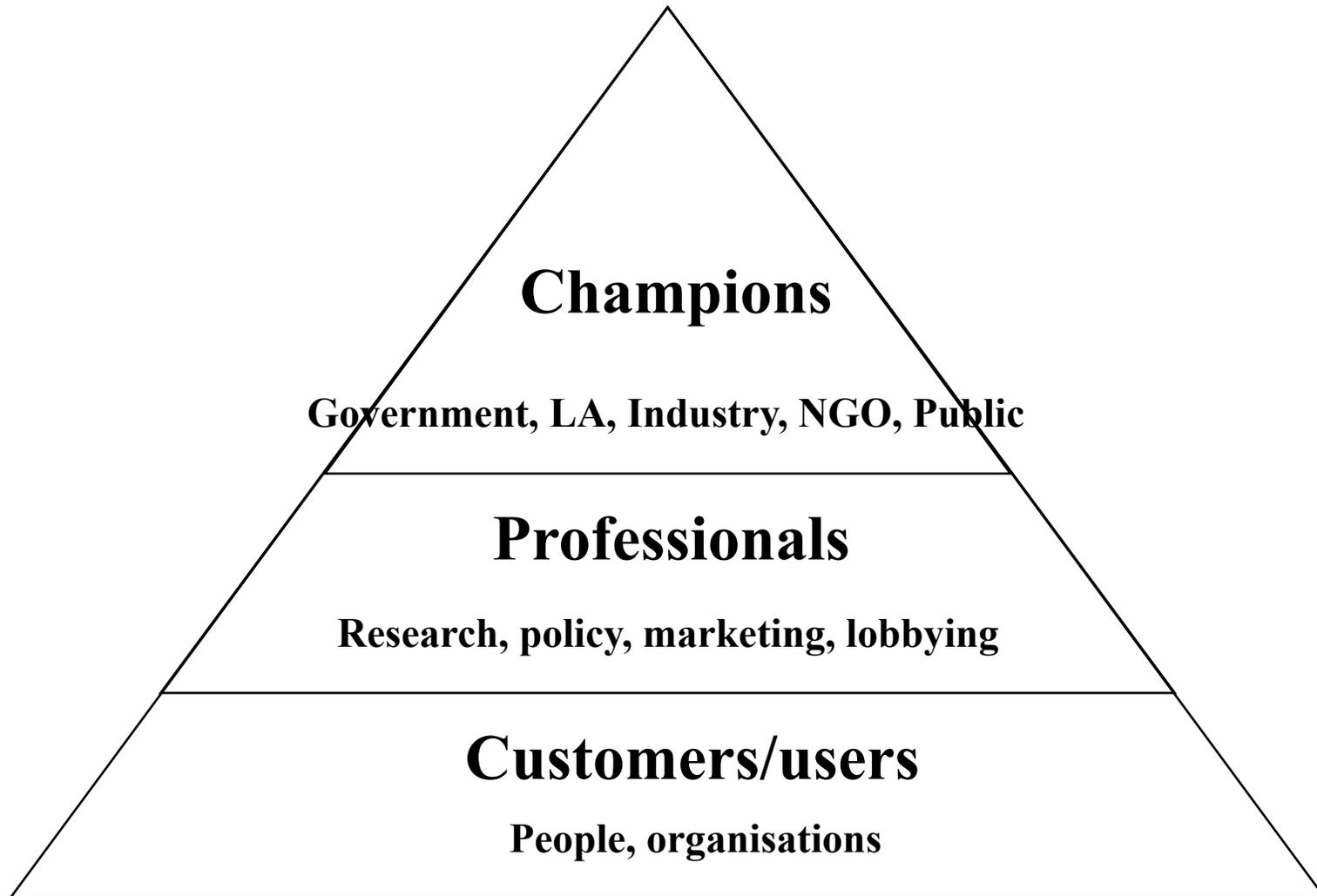
**Agency
Watersave
web pages**

**Water company
web pages**

**With all due respect to our the
Minister of Energy, Water &
Communications, not many
will be attracted to him talking
about WDM on TV**

**A TV Concert featuring Siti
Nurhaliza will definitely be
very attractive to all**

Essential support – national & local



Demand management - stakeholders

- **WDM involves “Users”, & it will not work if users are not involved**
- **Stakeholders involvement is vital in initiating a “WDM Movement”, keeping the momentum and finally reaching all sections and levels of society**
- **Many new (and very keen) stakeholders appear, but others can disappear, & it is vital to keep people “Interested” & “Involved”**
- **WDM needs a “National Champion” and local expertise**
- **WDM needs to keep track on all stakeholders and keep them on board.**

HOW TO KEEP ALL STAKEHOLDERS ON BOARD?

NETWORKS

WATERSAVE, WATER
WATCH ASIA,
INTERNATIONAL RIVERS
NETWORK,
ETC

MANUFACTURERS

INTEL, AMD, HP, NATIONAL,
PROTON, FORD, PETRONAS,

GOVERNMENT

FEDERAL, STATE, LOCAL AUTHORITY,
STATUTORY BODY, ETC

LOBBY GROUPS NGOS

WWP, WWF, MNS, CAP, MWA, SWWW,
FOMCA, ETC

LOCAL AUTHORITIES

AGENDA21, GREEN CAMPAIGN,
GOTONG ROYONG, ETC

Stakeholders

WATER COMPANIES

PBAPP, SAJ, PUAS, IWK,
THAMES WATER, VIVIENDI, ETC

FUNDING BODIES

UNDP, DANIDA, FORD FOUNDATION,
SUMITOMO, TOYOTA, IRPA, GOVERNMENT,
ETC

RESEARCH/ CONSULTANTS

UNIVERSITIES, PRIVATE CONSULTANTS, NGOS,
ENSEARCH, MARDI, RISDA, SMHB, ISIS, ETC

FARMERS' ASSOCIATION

CHFA, FAMA, ETC

WOMEN'S BODIES

WCC, KANITA, ETC

OTHER STAKEHOLDERS

REGULATORS

DOE, JPS, JBA, MUNICIPAL COUNCIL, ETC

HOUSING

CIDB, PKNS, BUILDERS, ARCHITECTS,
HOUSEBUILDERS FEDERATION
SUSTAINABLE HOMES, RHA

Globalisation of Water Demand Management

- **Pressures on world water resources are well documented and publicised**
- **International development in Water Demand Management reinforces and develops the subject**
- **In some countries WDM is an “up front” subject, well developed & successful – Others need to learn from these “Success Stories”**
- **In other countries, WDM is diluted & lost within water management jargon such as “Integrated Water Resources Management”, “Integrated River Basin Management”, etc**
- **Battle between local water conservation & funding for large dams still unresolved (low tech and high tech solutions).**

Future Drivers of WDM in Malaysia

- **Water Demand will Exceed Supply in the Very Near Future**
- **Water Privatisation (Rising Tariffs) is “Inevitable”**
- **Climate Change – Will cause more Droughts**
- **Housing & Population Pressures – Need more water**
- **Efficient Water Management is the Key (Water Law, Water Bill, Water Framework Directive, Water Regulations, etc)**
- **Innovation – Water Efficient Products, Gadgets, GIS, etc**
- **Computerised Metering System – 24 Hours Telemetric**
- **Water Sustainability is vital for Survival & Development.**

Threats to WDM in Malaysia

- **Loss of champions & momentum, indifference of ministers & LA (Bad Governance), Delays in Passing New Legislation on WDM**
- **Other priorities take over – Poverty Eradication, Economic Development, Education, Health & Disease Epidemics, Haze, Flooding (This issue will surely kill WDM), etc**
- **Modelling the environment/sustainability brings bad news (Negative Effects) which people do not want to hear**
- **Ownership of water demand management too diffuse**
- **Networks are lost, stakeholders drift away, Bad NGOs, etc**
- **Customers react against interference in their lives – E.g. IWK Bills, Rise in Water Tariffs, Tioman Marina, Penang Hill Development, Water Disconnection, etc**
- **Low Water Tariffs & Failures in Privatisation**
- **Weak Political Will & Loose Enforcement.**

Threats to WDM in Malaysia (Irresponsible Advertising)

CONSUMER ASPECTS OF WATER DEMAND MANAGEMENT

WDM can be carried out in factories, hotels, government departments, universities, schools, etc – But I'll just look at WDM in the Home.



HELPFUL TIP ON SAVING WATER

Stop drips

A fast dripping tap can waste up to 3,000 litres of water a day. This can be easily avoided by turning the tap tight, checking the washer and checking the



HELPFUL TIP ON SAVING WATER

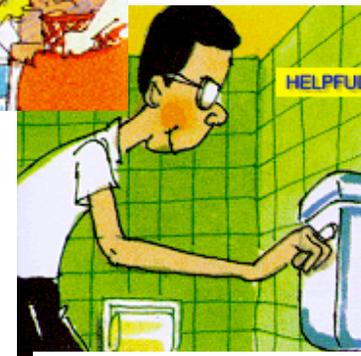
Use a bucket of water and a sponge to wash your car

Washing your car with two buckets of water rather than with a running hose saves

HELPFUL TIP ON SAVING WATER

Only wash full loads in your washing machine

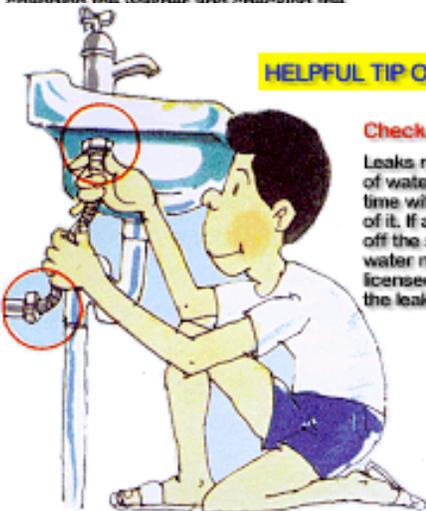
Generally, the same amount of water is used regardless of whether a full load is washed or not. You save water by ensuring that a full load of laundry is washed



HELPFUL TIP ON SAVING WATER

Make use of the half-flush

Very often, a half-flush is all you need to flush away waste. It uses 4.5 litres less water than a full flush.



HELPFUL TIP ON SAVING WATER

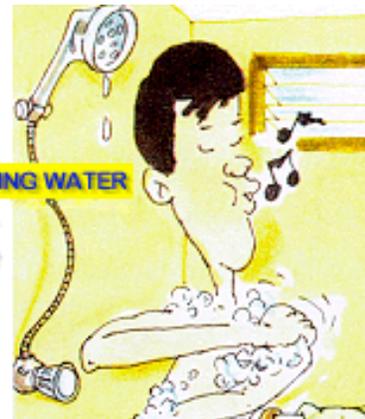
Check for leaks

Leaks result in large quantities of water lost over a period of time without you being aware of it. If a leak is detected, turn off the stop cock to the water meter and get a licensed plumber to repair the leak immediately.

HELPFUL TIP ON SAVING WATER

Save while you shower

You can save during your shower by limiting yourself to a short shower; controlling the volume of water while showering; and turning the tap off while showering.



HELPFUL TIP ON SAVING WATER

Washing your vegetables and meat in a sink filled with water saves up to 15 times more water than washing under a running tap. Also, washing dishes in a half-filled sink saves water than washing under a running tap.



**RECYCLING BE MADE MANDATORY FOR INDUSTRIES,
HOTELS & OTHER LARGE WATER USERS**

·HOTELS

·FACTORIES

**·INSTITUTES OF HIGHER LEARNING &
SCHOOLS**

·GOVERNMENT AGENCIES

·BUSINESSES

**ISO 14000
CERTIFICATION**

·OTHER BIG WATER USERS

·THE PUBLIC

WATER DEMAND MANAGEMENT IN INDUSTRY/HOTELS

EXAMPLE OF WATER DEMAND MANAGEMENT IN HOTELS IN MALAYSIA

IMPLEMENTATION MEASURES

- **“WATER AUDIT” FOR ALL USAGE IN HOTEL**
- **IDENTIFY/MONITOR WATER PRESSURE FOR LEAKS**
- **REPAIR ALL LEAKS IMMEDIATELY**
- **CONTROL WATER FLOW IN TAPS/FAUCETS BY REPLACING WITH WATER-SAVING EQUIPMENT**
- **RECYCLE WATER (RE-PIPE AIR-CONDITIONER WATER FOR HEATING, RE-PIPE WATER USED FOR COOLING FOR SHOWERS, ETC)**
- **INSTALLATION OF SPECIAL “VALVES” IN PIPES**
- **EDUCATE STAFF/GARDENERS ETC ON WATER SAVINGS**
- **EDUCATE CLIENTS/GUESTS ON WATER SAVING**
- **LOOK FOR ALTERNATIVE WATER SOURCES (SPRING WATER, WELL WATER, RAINFALL HARVESTING, ETC)**
- **OTHER MEASURES (E.G. DROUGHT RESISTANT PLANTS)**

(HOTEL A) BEFORE

Hotel average occupancy	:	~ 72%
Hotel total usage (per month)	:	13,000 m ³
Hotel room usage only (%)	:	61.5%
Actual hotel room usage only	:	8,028 m ³
Monthly water usage per guest room	:	$\frac{8,028 \text{ m}^3}{333 \text{ rooms}} = 24.11 \text{ m}^3$
Daily water usage per guest room per day	:	$\frac{24.11 \text{ m}^3}{30 \text{ days}} = 804 \text{ litres}$
Daily water usage per hotel guest	:	<u>402</u> litres per day

(HOTEL A) AFTER

Hotel average occupancy	: ~76%
Hotel total usage (per month)	: 9850 m ³
Hotel room usage (%) only	: 61.5%
Actual hotel room usage	: 6,058 m ³
Monthly water usage per guest room	: $\frac{6,058 \text{ m}^3}{333 \text{ rooms}} = 18.19 \text{ m}^3$
Daily water usage per guest room per day	: $\frac{18.19 \text{ m}^3}{30 \text{ days}} = 606 \text{ litres}$
Daily water usage per hotel guest	: 303 litres per day
Daily water savings per hotel guest	: 99 litres per day

**WATER SAVINGS FOR HOTEL= 666 guests X 99 litres
= 65,934 litres/day = 1,978,020 litres/month
= 23.74 million litres/year = RM23,740.00 Per Year**

RESULTS

- **SAVINGS 25%-33% MONTHLY WATER BILL**
(SAVED RM 8,000 – RM 10,000 PER MONTH)
- **SAVINGS IN SEWAGE TREATMENT (IWK) BILL**
- **REDUCTION IN WATER POLLUTION**
- **GET RETURNS WITHIN 2-3 YEARS**
- **GREEN IMAGE**
- **CORPORATE SOCIAL-ENVIRONMENTAL RESPONSIBILITY**
- **INCREASED PROFITS**



**WATER BILL = RM100,000 PER MONTH
= RM1.2 MILLION PER YEAR**

WATER RATE = RM1 per 1000 litres

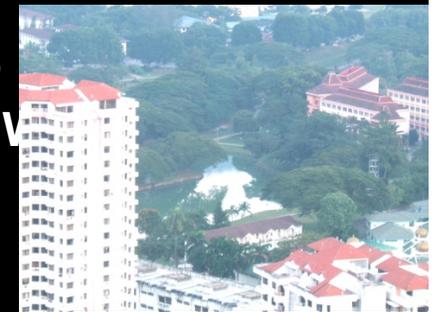
**WATER USED = 1,200,000,000 LITRES PER YEAR
= 60,000 LITRES/PERSON/YEAR
= 164 LITRES/PERSON/DAY**

**REDUCE WATER BY 1 FLUSH LESS PER PERSON PER DAY = 9 LITRES x
20,000 PEOPLE = 180,000 LITRES = 5,400,000 LITRES/MONTH =
64,800,000 LITRES/YEAR = 3 MID-SIZED DAMS**



OTHER WATER CONSERVATION MEASURES

- **“WATER AUDIT” FOR ALL BUILDINGS IN CAMPUS**
- **IDENTIFY/MONITOR WATER PRESSURE FOR LEAKS**
- **REPAIR ALL LEAKS IMMEDIATELY**
- **CONTROL WATER FLOW IN TAPS/FAUCETS BY REPLACING WITH WATER-SAVING EQUIPMENT**
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- **INSTALLATION OF SPECIAL “VALVES” IN PIPES**
- **EDUCATE STAFF/STUDENTS/VISITORS ON WATER SAVINGS**
- **INSTALL ALTERNATIVE WATER SOURCES (SPRING WATER, WATER, RAINFALL HARVESTING, ETC)**
- **INSTALL WATER METERS FOR ALL SCHOOLS, CANTEENS, COMPANIES, HOSTELS, ETC**



CONSERVATIVE ESTIMATE OF WATER DEMAND REDUCTION IS 20 % OF USAGE = 0.2 BILLION LITRES/YEAR = RM240,000 SAVINGS PER YEAR = 24 SCHOLARSHIPS WORTH RM10,000 EACH PER YEAR

WDM IN A CONDOMINIUM

- (1) “Nega-Litre Water Demand Management in N-Park Condominium, Batu Uban, Pulau Pinang” under Integrated Water Resources Management (IWRM) Best Management Practices (BMPs)
- *“Smart-Partnerships Between Government, Private Sector, NGO and Local Communities in N-Park Water Demand Management As a Best Management Practice in Integrated Water Resources Management (IWRM).”*

WATER SAVING EQUIPMENT

**EVOLVEMENT OF
UNIVERSAL
SOCIETY INTO A
“WATER SAVING
SOCIETY”**

**CHANGING OF
UNIVERSAL
SOCIETY FROM A
“CONSUMERISM
SOCIETY” TO ONE
BASED ON
NECESSITIES &
THE 3 Rs (Reduce,
Reuse & Recycle)**

**LITRES OF WATER NEEDED TO
PRODUCE:**

**1 TONNE OF PRINTING PAPER
= 47,300**

1 SUNDAY NEWSPAPER = 567

**1 TONNE OF ALUMINIUM =
757,000**

**1 TONNE OF SYNTHETIC
RUBBER = 1.89 MILLION**

1 COMPUTER CHIP = 17,000

1 AVERAGE SIZED CAR = 147,000

1 PAIR OF JEANS = 6800

How Much Water Do We Use?

How Much Water Does It Take For The Following Activities?

·Taking a Bath or Shower	50-100 Litres
·Watering the Lawn and Yard	700 Litres
·Washing the Dishes by Machine/Hand	50-200 Litres
·Washing Clothes	200 Litres
·Washing the Car	400 Litres
·Brushing Your Teeth	4 Litres
·Cooking	40 Litres
·Drinking	2 Litres
·Flushing the Toilet (once)	15-25 Litres

CONCLUSIONS

- **WDM is necessary to ensure sustainable water resources now & in future**
- **Reward WDM champions & create champions from “Well Known” personalities**
- **Implement Water Tariffs that make sense to save water**
- **Greater focus on the subject of WDM to ensure water conservation is considered in all Development strategies & actions**
- **Awareness & Education: Ensure that future generations are educated to understand & carry out water conservation (WDM in curriculum?)**
- **Mandatory for Industry, Business & Big Users to save H₂O**
- **Keep WDM momentum going at all times (not “Seasonal” like Durian)**
- **Creating a “Water Saving Society” out of a “Water Wasting Society”.**

THANK YOU

SAVE WATER FOR A BETTER WORLD

Water Watch Penang
10 Brown Road, 10350 Penang, Malaysia
Tel: 6-04-2283306
Fax: 6-04-2267042
Website: www.waterwatchpenang.org
Email: waterwatchchan@hotmail.com

MAKE EVERY DROP COUNT