The Malaysian Water Association
MWA WATER LEADERS’ FORUM

Avoiding Water Crisis in Malaysia
Lessons for the future”¹

Keynote Address by:
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2 Chairman, SMHB Sdn Bhd [datosyed@smhb.com]
The theme “AVOIDING WATER CRISIS IN MALAYSIA” is both appropriate and timely.

It provides very important challenge central to the mandate of modern day:

   Water Users, Business and Policy makers.

Consistent with

   Growth Delivery in the age of intensifying competition.

   and the demanding role to play in future water availability with Global Warming.
Such Growth Delivery, however, must be achieved with NOT ONLY Finite but also Depleating Sources – which water is.

GROWTH must be accompanied by SUSTAINABLE development.

As stated by the Prime Minister, Datuk Seri Najib Tun Razak when launching “Energy for Tomorrow” Conference in KL on 19 November, 2014.

“we can demonstrate that sustainable development isn’t an indulgence but can be a precursor for success”
Generally, **WATER CRISIS**, is an outcome of a **THREAT** to water resources (including land) causing Water Scarcity

More specifically,

Water Scarcity – driven by:

- Depletion of usable freshwater resources
- Growing freshwater need

**IS WATER SCARCITY THE MAIN PROBLEM?**

Yes **BUT** not entirely true.
We have WATER MANAGEMENT PROBLEM
The perception that water is readily available (at all times) because:
The country has abundant rainfall
Can no longer be sustained and should change.
“WATER SCARCITY” is a transient event and even a “rainfall – rich” country, such as ours, does face such events periodically.

For the moment, we are in the category of:

ECONOMIC WATER SCARCITY which is - Inadequate management of the sufficiently available water resources such as, in most abundant water resources countries of South-east Asia
COULD WATER CRISIS AFFECT “Water-rich” nations like MALAYSIA?

According to United Nations Development Programme (UNDP)

- **Economic Water Scarcity** is often the cause of water scarcity, mainly in developing countries. Enough water to meet domestic, industrial, agricultural, energy production and environment needs.

- But lack of the means to provide it in an accessible and sustainable manner.

ASEAN countries use up to 10 per cent of available resources. (Malaysia about 2 ½ %)

Annual Average Water Availability about 28,400 m³ per capita – abundant water (about 795 billion cubic metres). Requirements in 2010, 16 billion cubic metres (NWRS (Rev. 2012))

Water withdrawal against available resources (1900 – 2025)

Source: ADB - Water For All (The Water Policy) June 2003

Water sector: regional trends and projection
WHAT CAN WE DO ABOUT WATER CRISIS?

PRACTICE OF WATER MANAGEMENT in the country – Needs REFORMATION. Cannot afford the practice of “BUSINESS AS USUAL ANYMORE”.

Since the 1980s much has changed in the country.

- Tremendous change in socio-economic landscape
- Population has grown
- Economy diversified
- Urbanisation expanded
- Society more affluent.

Malaysia is now on the verge of being a developed ‘high income’ nation by 2020: only 6 years away.

### Population figures

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Demand (Water Supply Production)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>14M</td>
<td>2,000 Mld</td>
</tr>
<tr>
<td>2011</td>
<td>28M</td>
<td>14,600 Mld</td>
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</tbody>
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### Demand

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</tbody>
</table>

### Urban population

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>35%</td>
</tr>
<tr>
<td>2011</td>
<td>73.5%</td>
</tr>
</tbody>
</table>
WATER CRISIS IS REAL—Challenge Formidable

Planning to overcome the threat by Water Resources has usually been ‘SUPPLY DRIVEN’

- Meaning: whenever there is a ‘shortage’ the solution relies on capital investment in new structural works and treatment facilities.
- Always plan ahead of time (series of 5 year Development Plan).

IS THIS THE RIGHT APPROACH?

Supply driven approach has been criticized because –
Cost of developing new sources is getting bigger as most accessible water resources have been tapped. (UNESCO, 2003)

The reformation approach includes

• Optimise in water use. Preserve rather than undue waste of water.
• Draw on all water sectors to work closely together.
• A commitment by each sector to share water resources and agree on sectoral allocation.
• Make the best use of water resources by investing in and incentivising “reduce, reuse and recycle” system. Or 3R.

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IS THIS THE RIGHT APPROACH?

Supply driven approach has been criticized because –
Cost of developing new sources is getting bigger as most accessible water resources have been tapped. (UNESCO, 2003)
The reformation approach (Cont’d)

- Start managing groundwater as valuable resource, especially in water crisis.
- Revitalise irrigation institutions formation of irrigation services.
- Enhance challenge of the Water-Food and Energy Nexus

THE APPROPRIATE APPROACH IS APPLYING WATER DEMAND MANAGEMENT (WDM)

IS THERE ANY BETTER WAY?

Best utilising the water that is already available, and

Minimise the impacts of new supply

Optimising in the use of water.
Water conservation measures (as practiced in Demand Management) are often perceived only as Drought Relief Mechanisms that result in reduced service level. (UN-HABITAT, 1999).

In fact, WATER RESTRICTION (As practiced in DEMAND MANAGEMENT) should always be practiced (at all times) as done in most developed countries of the world.
WATER CONSERVATION (WDM) TOOLS AND DEVICES

Among the major programmes include:
• Reduction in NRW
• Reduction in Water Usage and Wastage
• Irrigation efficiency in agriculture
• Wider use of 3R (Reduce, Recycle & Reuse)
• Role of water pricing in WDM
• Public Awareness Campaign and Stakeholders’ participation in WDM (particularly domestic and industrial users and farmers in irrigated agriculture)

which are briefly mentioned in this presentation.

The others include:
Promotion of Water Saving Devices
Adoption of Water Efficient Devices
Water Efficiency Labelling
Groundwater Development
Basis of Lessons for the Future

1. Recent Water Crisis in Selangor, Federal Territory Kuala Lumpur and Putrajaya.


3. The Water Demand Management (WDM) Study by Academy of Sciences Malaysia (ASM) (Preliminary Outcomes)
Recent Water Crisis in Selangor, Federal Territory Kuala Lumpur and Putrajaya

The shortage is **not entirely** due to inadequate capacity of Water Treatment Plants and distribution infrastructure. It is due to:

- Inadequate water resources recharge.
- Environmental issue – namely pollution (exacerbated by low flows) of river water sources by industries and poorly operated sewerage treatment plants.

Water rationing was imposed in Selangor, FTKL and Putrajaya between 27 February to 1 May 2014.
Recent Water Crisis in Selangor, Federal Territory Kuala Lumpur and Putrajaya

As a comparison, Australia and Singapore, two water scarce countries have not resorted to WATER RATIONING in recent times – even in severe drought conditions. They strictly practice WATER RESTRICTION at all times by adhering to IWRM and WDM practices.

The Experience:

- The public and industries had to “cooperate” – the hard way – by reducing consumption and wastage, a culture in WDM practice. Why can’t this practice be made to continue at all times i.e., outside the drought period?
- Need more the culture of self-enforcement and self sanction
- Emergence of “Social and Economic Water Sensitive Areas/Regions”
- An appreciation of “Water Security”
It should be realized that:

**WATER RATIONING** is not the only solution for water shortage.

**WATER RESTRICTION** should always be practiced (WDM and IWRM principles).

In this crisis, 10% water reduction of total demand was applied.

This would not have been necessary if NRW reduction of 11% and per capita per day usage was reduced from 212 to 180, a combined reduction of nearly 20% (giving a **TOTAL REDUCTION** of about 30%).
Recent Water Crisis in Selangor, Federal Territory Kuala Lumpur and Putrajaya

As an illustration, demands in Selangor, Kuala Lumpur, Putrajaya and Pulau Pinang are shown below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>BASE CASE (No reduction in NRW &amp; fixed lcd)</td>
<td>4,037.1</td>
<td>4,454.9</td>
<td>4,797.5</td>
<td>5,257.2</td>
</tr>
<tr>
<td>2.</td>
<td>Reduction of lcd to 180</td>
<td>4,037.1</td>
<td>4,454.9</td>
<td>3,649.3</td>
<td>4,034.3</td>
</tr>
<tr>
<td>3.</td>
<td>Reduction of lcd to 180 and NRW to 25%</td>
<td>4,037.1</td>
<td>4,454.9</td>
<td>3,459.0</td>
<td>3,824.8</td>
</tr>
</tbody>
</table>

Baseline = 2015 (Improvement by 2020) – Savings 1438 Mld

Note: Demand projections based on NWRS (Revised 2012) (Actual 2014 demand = 4620 Mld)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>BASE CASE ( Maintain NRW and domestic per capita consumption)</td>
<td>2678</td>
<td>3042</td>
<td>3360</td>
</tr>
<tr>
<td>2.</td>
<td>With reduction in domestic per capita to 180 lcd</td>
<td>2678</td>
<td>2777</td>
<td>2786</td>
</tr>
<tr>
<td>3.</td>
<td>With Domestic Per Capita of 180 lcd and NRW (25%) as per SPAN</td>
<td>2678</td>
<td>2497</td>
<td>2301</td>
</tr>
</tbody>
</table>

Baseline 2015 (Improvement by 2020) – Savings 1059 Mld
Recent Water Crisis in Selangor, Federal Territory Kuala Lumpur and Putrajaya

We need to establish Stakeholders Platforms

Inevitably, one of the critical success factors of WDM is public stakeholders participation and support. In line with the principles of IWRM, Public stakeholder platforms should be established soonest in all States and at the Federal level as well and with special and significant budget allocations for wide scale capacity building programs.

In a country where ethics and integrity reign supreme, observing laws and regulations is part of social culture.

Unregulated Available Water is depleting

- Five States in the Peninsular already in deficit
- Others declining
- Demand continues increasing

PRIORITY for WDM and IWRM application

<table>
<thead>
<tr>
<th>States</th>
<th>Land Area (sq. km)</th>
<th>Total Consumptive Water Demand (mm)</th>
<th>Effective rain (mm)</th>
<th>Excess/(Deficit)(mm) - Unregulated Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perlis</td>
<td>821</td>
<td>372.1</td>
<td>364.2</td>
<td>348.1</td>
</tr>
<tr>
<td>Kedah</td>
<td>9,500</td>
<td>307.6</td>
<td>313.2</td>
<td>299.1</td>
</tr>
<tr>
<td>Pulau Pinang</td>
<td>1,048</td>
<td>729.9</td>
<td>790.9</td>
<td>797.1</td>
</tr>
<tr>
<td>Perak</td>
<td>21,035</td>
<td>92.7</td>
<td>91.4</td>
<td>85.5</td>
</tr>
<tr>
<td>Selangor</td>
<td>8,396</td>
<td>266.6</td>
<td>296.6</td>
<td>306.1</td>
</tr>
<tr>
<td>Negeri Sembilan</td>
<td>6,686</td>
<td>50.9</td>
<td>54.0</td>
<td>53.6</td>
</tr>
<tr>
<td>Melaka</td>
<td>1,664</td>
<td>194.1</td>
<td>219.9</td>
<td>225.9</td>
</tr>
<tr>
<td>Johor</td>
<td>19,210</td>
<td>37.2</td>
<td>45.8</td>
<td>53.8</td>
</tr>
<tr>
<td>Pahang</td>
<td>36,137</td>
<td>20.1</td>
<td>26.2</td>
<td>24.8</td>
</tr>
<tr>
<td>Terengganu</td>
<td>13,035</td>
<td>67.8</td>
<td>74.8</td>
<td>74.4</td>
</tr>
<tr>
<td>Kelantan</td>
<td>15,099</td>
<td>108.1</td>
<td>107.2</td>
<td>105.0</td>
</tr>
<tr>
<td>Pen. Malaysia</td>
<td>132,631</td>
<td>96.5</td>
<td>103.0</td>
<td>102.2</td>
</tr>
<tr>
<td>Sabah</td>
<td>73,631</td>
<td>12.4</td>
<td>18.4</td>
<td>18.9</td>
</tr>
<tr>
<td>FT Labuan</td>
<td>91</td>
<td>197.7</td>
<td>264.3</td>
<td>285.0</td>
</tr>
<tr>
<td>Sarawak</td>
<td>124,450</td>
<td>8.5</td>
<td>17.4</td>
<td>17.1</td>
</tr>
<tr>
<td>Sabah, FT Labuan &amp; Sarawak</td>
<td>198,172</td>
<td>10.0</td>
<td>17.9</td>
<td>17.9</td>
</tr>
<tr>
<td>Total Malaysia</td>
<td>330,803</td>
<td>44.7</td>
<td>52.0</td>
<td>51.7</td>
</tr>
</tbody>
</table>

The Need to transform from Supply Management to Water Demand Management (WDM)

- Land and Water Resources availability for water resource development limited
- Need to “Make Best Use of Existing Facilities”
- NRW and Per Capita usage reduction.
- 3Rs must be in ALL Sectors and between ALL Sectors
Water Demand Management Study (ASM) Preliminary Outcomes

Wastewater is a Resource
“Returned Water” by all sectors must be in the “Water Resources” Equation

<table>
<thead>
<tr>
<th>Year 2020</th>
<th>Year 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total estimated potable water demand for Selangor, KL and Putrajaya</td>
<td>Total estimated potable water demand for Pulau Pinang</td>
</tr>
<tr>
<td>4,896 Mld</td>
<td>977 Mld</td>
</tr>
<tr>
<td>Total estimated effluent water available for recycling (source IWK estimated)</td>
<td>Total estimated effluent water available for recycling (source IWK estimated) *</td>
</tr>
<tr>
<td>1,200 Mld</td>
<td>100.820 m3/day (100.8 Mld)</td>
</tr>
<tr>
<td>Percentage of water recycled</td>
<td>Percentage of water recycled</td>
</tr>
<tr>
<td>24.5%</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

Potential for water supply augmentation by recycling of wastewater in Selangor, KL and Putrajaya

Potential for water supply augmentation by recycling of wastewater in Pulau Pinang

As an example, total potential augmentation from bio-mass effluent for Selangor, FTKL and Putrajaya is estimated to reach 24.5% of total demand in 2020.

* RSTP Bayan Baru 75,186 m3/day
RSTP Perindustrian Prai 3,288
RSTP Butterworth South - Sg. Nyior 22,346
RSTP 100,820 m3/day
The NWRS 2012 indicated a commitment by the Agriculture (Paddy Irrigation) Sector to increase water productivity e.g. in MADA Granary.

Increases in water productivity by implementing irrigation efficiency – water irrigation demand can be reduced by 105 mcm/year = a relief of 288 Mld.

Representing nearly 25% of the water supply requirements of the population of “water deficit” states of Kedah, Perlis and Pulau Pinang.
Water Demand Management Study (ASM) Preliminary Outcomes

Water Resources still not integrated

- Water Resources Development has always been on a “Sectoral” Approach
- The time has come to share these sectoral waters
- Dams need to be multipurpose
- Need to integrate data and information
Water Demand Management Study (ASM)

Preliminary Outcomes

Need for new Financing Structure and Fair Tariffs

Financing is another contentious issue amongst water managers and operators. Without adjustment to the present tariffs, there is no way for cost recovery as well as reducing wastages in water uses and losses from NRW. A definitive financing plan to resolve this issue is still elusive.

When will we ever have such a plan that could satisfy the politician, the public and the water managers?

- Good Quality Returned Water need new investments
- Tariffs for water supply and sewerage must be fair
- In return, the service level must match the tariff imposed
- All Sectors should aim for cost recovery
Conclusions and Recommendations

1. The recent water crisis in Selangor, FTKL and Putrajaya and other parts of Peninsular Malaysia should provide urgent impetus for the authorities to revisit IWRM and adopt IWRM approach and with this, to transform the Nation and State water management emphasis from supply Management to Water Demand Management (WDM).

2. Water Demand Management (WDM) is an integral aspect of any IWRM Masterplan. As the State and Country progress, WDM will need to be more detailed a subject beyond the domain of the Water Supply Sector and covers the full spectrum of the water management sector. The WDM plans and effort will need to cover both inter-sector WDM as well as within Sector WDM.
Conclusions and Recommendations (cont’d)

3. In order to avoid serious water crisis in the future, it is vitally important that total 3Rs (Reduce, Reuse, Recycle) strategies be included as strategies in WDM for all sectors. Recycling of bio-mass effluent for industrial and municipal use should be encouraged. Some new aspects that could be added include irrigation water savings within the agricultural sector and WDM for the environment for preservation of freshwater availability and for emerging industries (eg. tourism).

4. Inevitably, one of the critical success factors of WDM is public stakeholders participation and support. In line with the principles of IWRM, Public stakeholder platforms should be established soonest in all States and at the Federal level as well and with special and significant budget allocations for wide scale capacity building programs.
Conclusions and Recommendations (cont’d)

5. This is especially necessary for developing and introducing Government-Public mutually acceptable water pricing and financing structures for IWRM, WDM and scientific and technological advancement for sustainable development. As an example for treated water, with the formation of SPAN, an industry business model has been formulated to achieve long-term economic sustainability, like achieving full-cost recovery. A Sewerage Capital Contribution Fund has been created with all monies contributed by developers or constructors. A similar business model may need to be undertaken, on a long-term basis, as farming transforms into commercial enterprises, to gradually reduce subsidies and make water available, whenever required, to farmers at appropriate charges and service levels.
6. Of utmost importance, **WDM Masterplan** needs to be formulated and, possibly, introduced in the 11\textsuperscript{th} Malaysian Development Plan. Adequate budget allocation will have to be provided for the much required Reformation in overall Water Management.

ANY SUGGESTION ON THE AMOUNT or How To WORK THIS FIGURE OUT?
Terima Kasih