

Malaysia Water Resources Management Forum 2014

Avoiding Water Crisis in Malaysia **- Lessons for the Future¹**

By:

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Water, water everywhere Nor any drop to drink

Rime of the Ancient Mariner, S.T. Coleridge

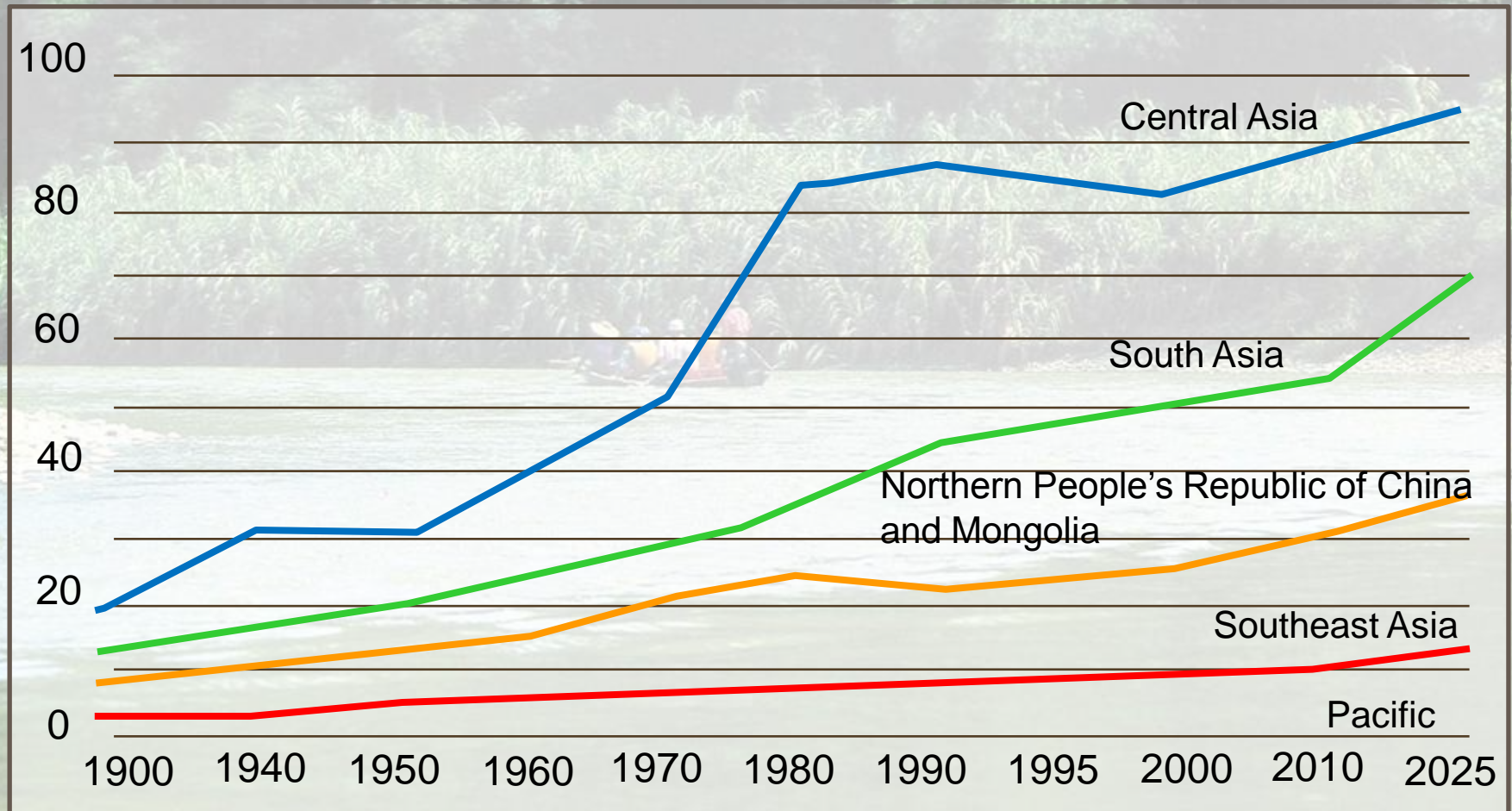
A photograph showing a polluted riverbank. The foreground is covered in a thick layer of trash, including plastic bottles, food waste, and other debris. In the background, there are several multi-story buildings, some with red roofs, and a body of water reflecting the scene. The text is overlaid on the image.

**Water, water everywhere at
Sungai Kelang near Shah Alam
Not a drop can be used**

Can we do Something?

*Photo credit:
The Star, February 2011*

Water withdrawal against available resources (1900 – 2025)



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

Water sector: regional trends and projection



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.

Are we in this category?



Planning to overcome the threat by Water Resources is usually '**SUPPLY DRIVEN**'

- Meaning: whenever there is a 'shortage' the solution relies on **capital investment** in new structural works and treatment facilities.

IS THIS THE RIGHT APPROACH?

For this reason, innovations in terms of 'demand management' are rather limited.



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)

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)

Basis of Lessons for the Future

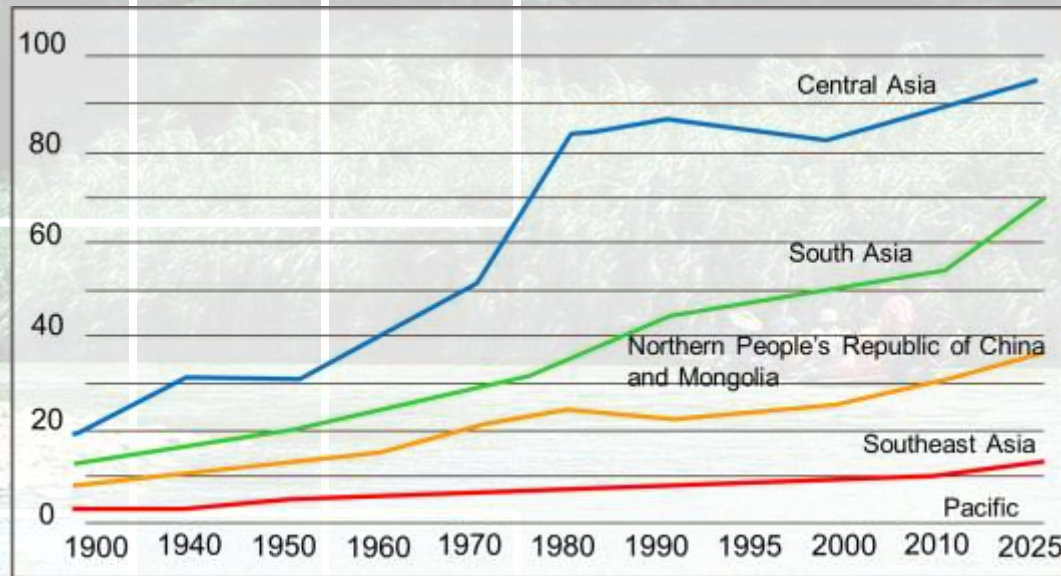
1. The 2012 Review of National Water Resources Study 2000-2050 (Reviewed in 2012).
2. The Water Demand Management (WDM) Study by Academy of Sciences Malaysia (ASM) (Preliminary Outcomes)
3. Recent Water Crisis in Selangor, Federal Territory Kuala Lumpur and Putrajaya.



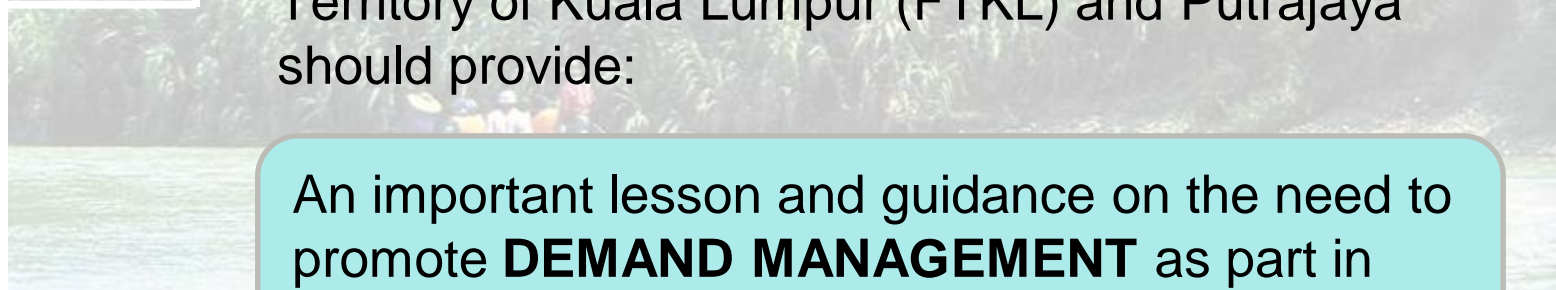
Water Demand Management Study (ASM)

Preliminary Outcomes

“Abundance of Water” is only a “Perception”



- For the “Abundance of Water” we are blessed with “Wealth in Environment and Biodiversity”
- “Available Water” for Humans is actually “Potential Abstraction from Water for the Environment”
- We need to know “WDM for the Environment”
- We need to “Recharge Natural Freshwater”
- We need to evaluate Groundwater Resources



The recent water crisis in Selangor, Federal Territory of Kuala Lumpur (FTKL) and Putrajaya should provide:

An important lesson and guidance on the need to promote **DEMAND MANAGEMENT** as part in Economic Scarce Water Management.



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

Water rationing was imposed on 27 February, 2014 and lifted on 1 May, 2014. (slightly more than two months).

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.

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 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 practiced be made to continue **at all times** i.e., outside the drought period?*

- Emergence of “Social and Economic Water Sensitive Areas/Regions”
- An appreciation of “Water Security”

For the Future National and State Water Management

Selangor, FTKL and Putrajaya has recently gone through a period of water crisis.

Perlis, Kedah and Penang in the north, Melaka in the south are facing unsustainable development conditions (National Water Resources Study 2000-2050: reviewed 2012).

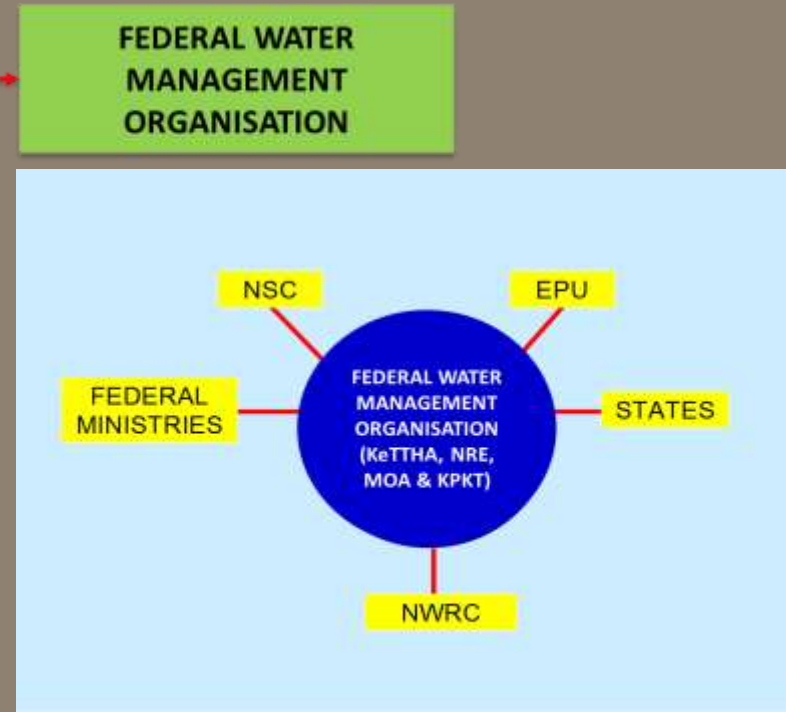
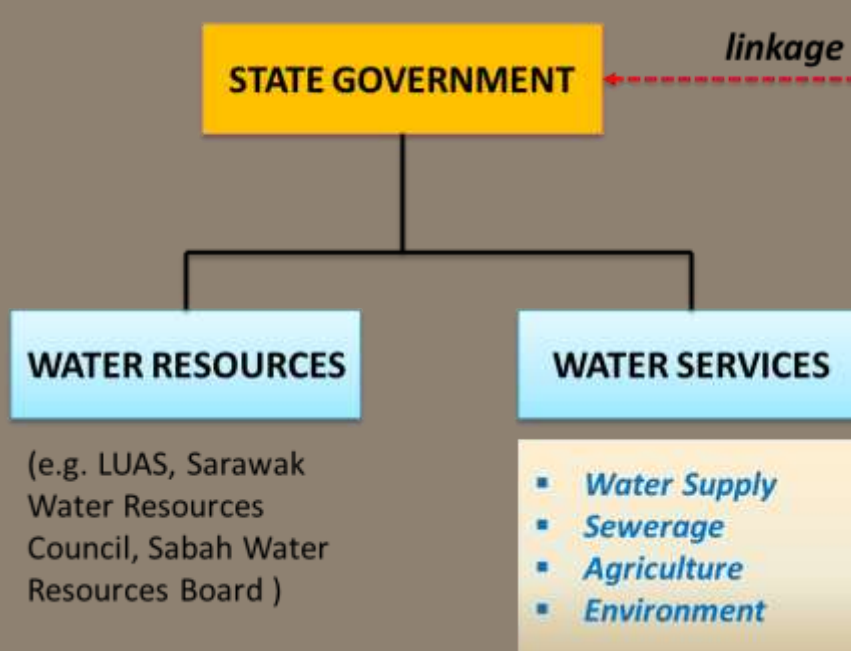
For that matter, Johor may face similar problem due to rapid development at Iskandar region.

We need to transform from Supply Management to Water Demand Management

This is especially necessary as the event has exposed the emergence of “Social and Economic Water Sensitive Regions” within the States that are also of national interests. Some examples are the Growth Centres of Selangor, FTKL, Putrajaya, Johor and Penang) and Rice Producing Regions (the Granaries) in Perlis, Kedah, Penang and North Perak. Such areas and similar areas in Sabah and Sarawak should be declared as "Water Security Areas" and managed from the perspective of Disaster Risk Reduction and adopting IWRM and WDM approaches.

For the Future National and State Water Management

We need to review institutional structure



It is also for this reason that full spectrum of water management is under state responsibility as provided for under the Constitution. Most states in the country have established a single, high level, multidisciplinary institutional leadership in water resources management. By the same reasoning, there is now a necessity for a single institution or UNIT to be established at the *highest* Federal level (integrating support from ministries of KeTTHA, NRE, MOA and KPKT) with linkages to National Security Council, National Water Resources Council, the State Governments and Federal ministries. Such an institution would be in a strong position to advocate the use of IWRM and WDM approach in the interest of water security and long-term water resources planning for the country.



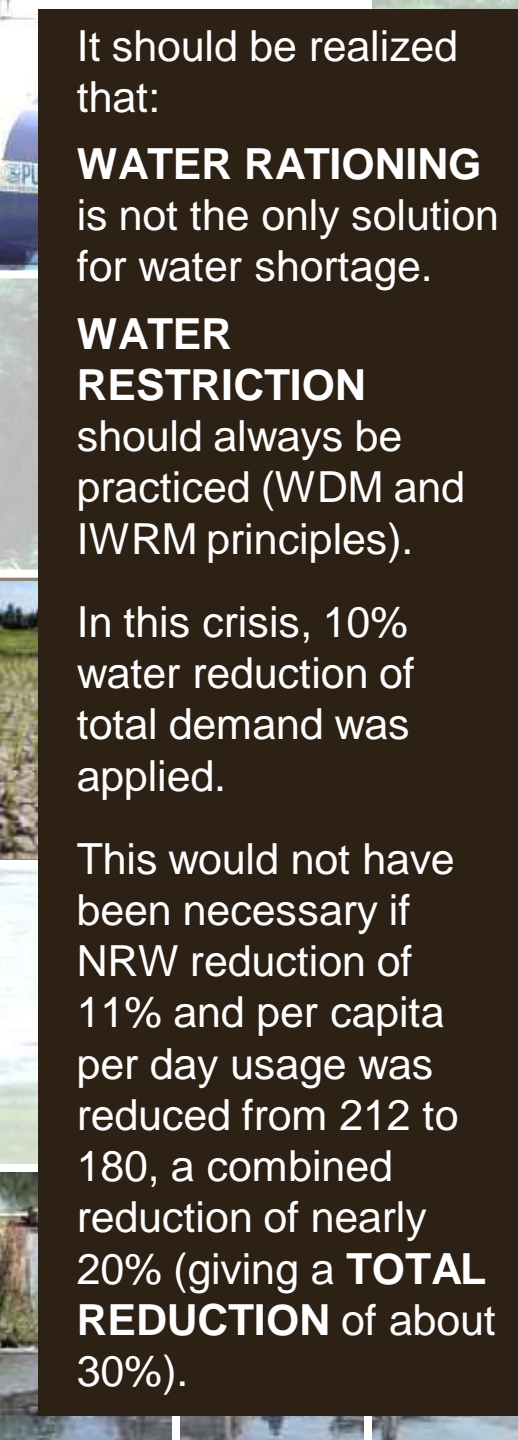
For the Future National and State Water Management

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 Penang.**

We must implement 3Rs by ALL Sectors

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).



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%).

For the Future National and State Water Management

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.



For the Future National and State Water Management

A water asset holding company was set up known as Pengurusan Aset Air Berhad (PAAB) that is tasked with the responsibility to facilitate the raising of much needed funds for the industry at the lowest interest rate possible.

We need to develop New Financing Models

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.

The 2012 Review of National Water Resources Study 2000 -2050 (NWRS 2012).

(1) Unregulated Available Water is depleting

States	Land Area (sq. km)	Total Consumptive Water Demand (mm)					Effective rain (mm)	Excess/(Deficit)(mm) - Unregulated Flows				
		2010	2020	2030	2040	2050		2010	2020	2030	2040	2050
Perlis	821	372.1	364.2	348.1	345.7	342.8	70.5	(301.6)	(293.7)	(277.6)	(275.2)	(272.3)
Kedah	9,500	307.6	313.2	299.1	302.4	302.8	112.5	(195.1)	(200.7)	(186.6)	(189.9)	(190.3)
Pulau Pinang	1,048	729.9	790.9	797.1	834.2	853.3	120.0	(609.9)	(670.9)	(677.1)	(714.2)	(733.3)
Perak	21,035	92.7	91.4	85.5	85.6	86.1	139.5	46.8	48.1	54.0	53.9	53
Selangor	8,396	266.6	296.6	306.1	328.7	348.0	114.0	(152.6)	(182.6)	(192.1)	(214.7)	(234.0)
Negeri Sembilan	6,686	50.9	54.0	53.6	54.7	56.0	73.5	22.6	19.5	19.9	18.8	17.5
Melaka	1,664	194.1	219.9	225.9	245.7	263.7	85.5	(108.6)	(134.4)	(140.4)	(160.2)	(178.2)
Johor	19,210	37.2	45.8	53.8	60.6	67.7	171.0	133.8	125.2	117.2	110.4	103.3
Pahang	36,137	20.1	26.2	24.8	25.2	26.5	165.0	144.9	138.3	140.2	139.8	138.5
Terengganu	13,035	67.8	74.8	74.4	76.6	78.7	253.5	185.7	178.7	179.1	176.9	174.8
Kelantan	15,099	108.1	107.2	105.0	106.0	106.2	175.5	67.4	68.3	70.5	69.5	69.3
Pen. Malaysia	132,631	96.5	103.0	102.2	105.9	109.2	159.0	82.5	56.0	56.8	53.1	49.8
Sabah	73,631	12.4	18.4	18.9	19.6	20.8	177.0	164.6	158.6	158.1	157.4	157.0
FT Labuan	91	197.7	264.3	285.0	304.0	318.0	322.5	124.8	58.2	37.5	18.5	4.5
Sarawak	124,450	8.5	17.4	17.1	17.5	18.1	220.5	212.0	203.1	203.4	203.0	202.4
Sabah, FT Labuan & Sarawak	198,172	10.0	17.9	17.9	18.4	18.9	208.5	258.5	250.6	250.6	250.1	249.6
Total Malaysia	330,803	44.7	52.0	51.7	53.5	55.1	225.0	180.3	173.0	173.3	171.5	169.9

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

Demand Increasing

Unregulated Flow in Deficit

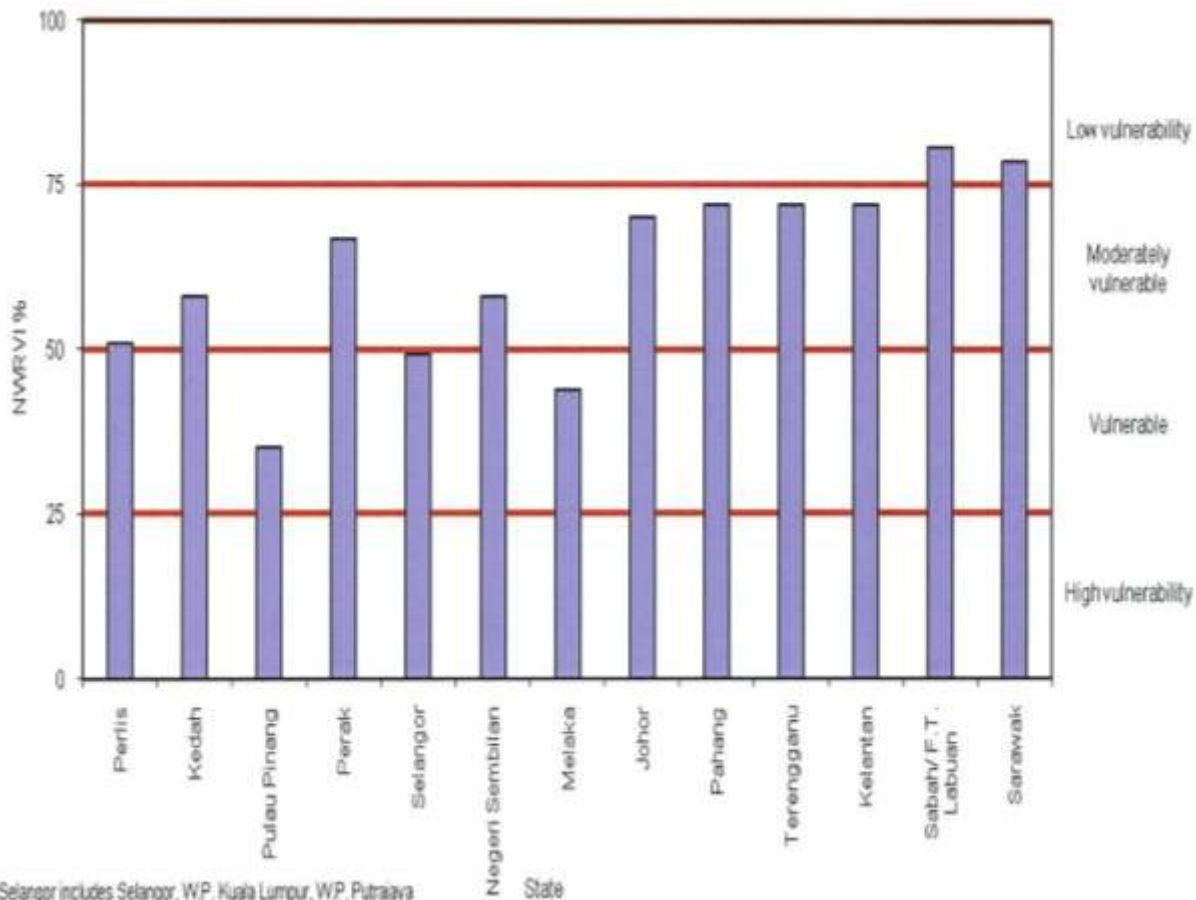
Unregulated Flow Declining

Malaysia

Source: Review NWRS 2000-2050 (2012)

The 2012 Review of National Water Resources Study 2000 -2050 (NWRS 2012).

(2) National Water Resources Vulnerability Index (NWRVI) declining

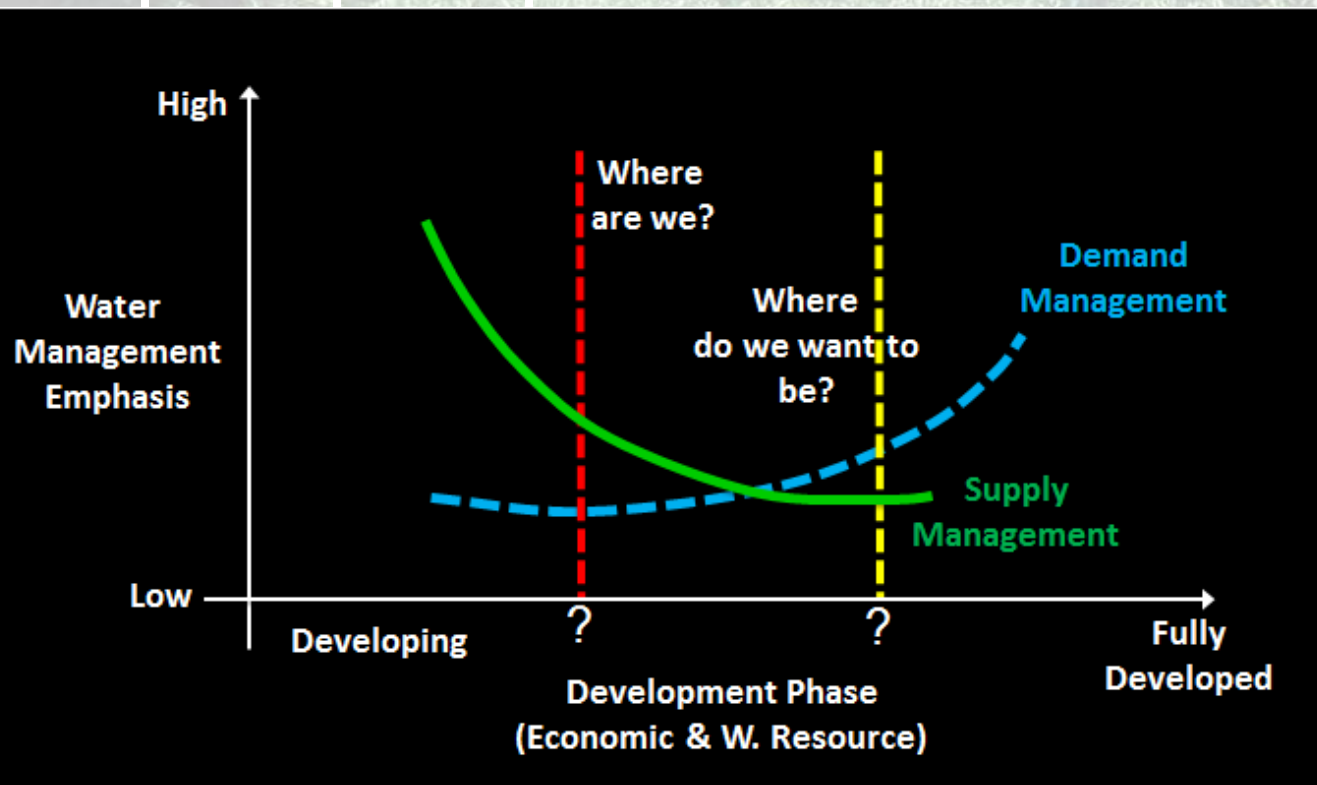


- Only Sabah and Sarawak in “Low Vulnerability”; BUT nearing “Moderate”
- All Peninsular States NOT in “Low Vulnerability”
- Four States “Vulnerable”

Water Demand Management Study (ASM)

Preliminary Outcomes

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

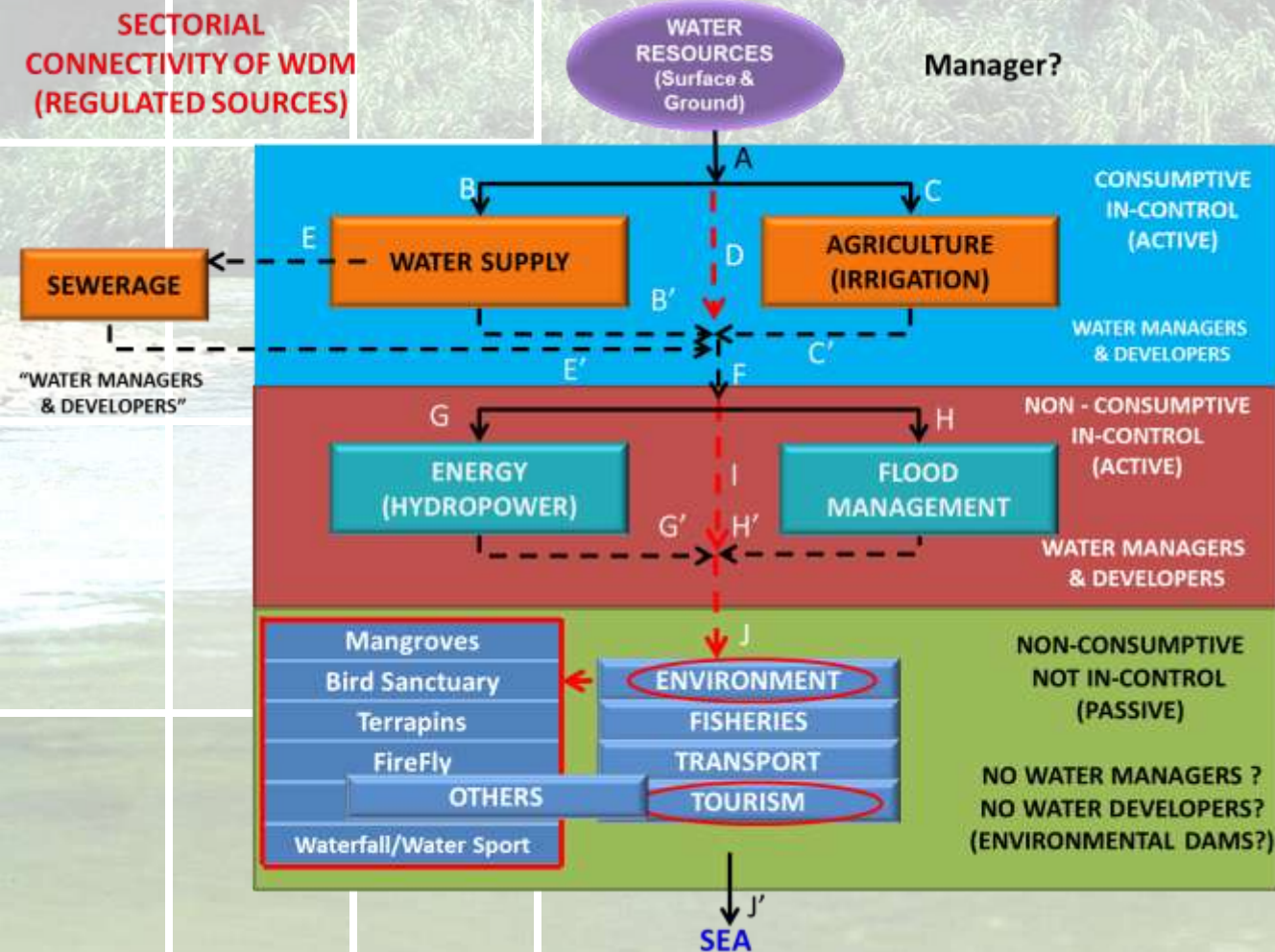


- Land and Water Resources availability for water resource development limited
- Need to “Make Best Use of Existing Facilities”
- **3Rs** must be in ALL Sectors and between ALL Sectors

Water Demand Management Study (ASM)

Preliminary Outcomes

(2) Need for Inter and Intra Sector WDM



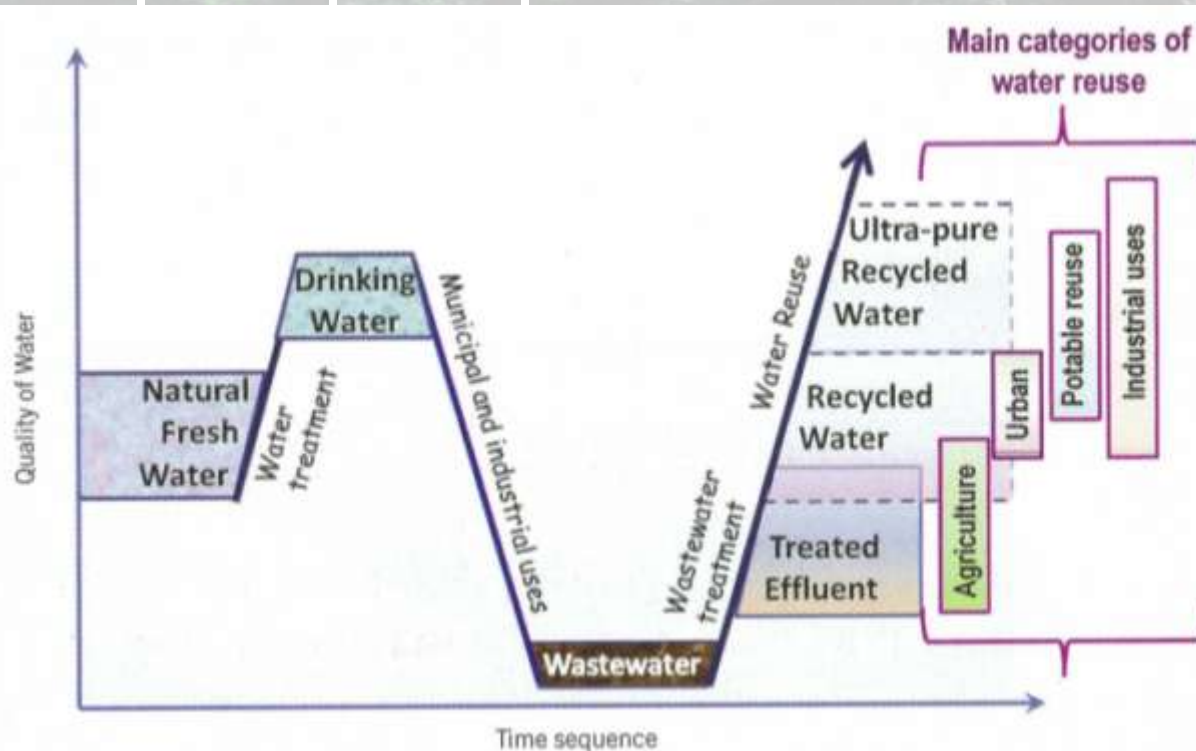
- WDM for “Passive Users” must be considered
- NO custodian for “Water for the Environment”

Water Demand Management Study (ASM)

Preliminary Outcomes

(3) Wastewater is a Resource

- “Waste Water” is a resource
- “Returned Water” by all sectors must be in the “Water Resources” Equation”



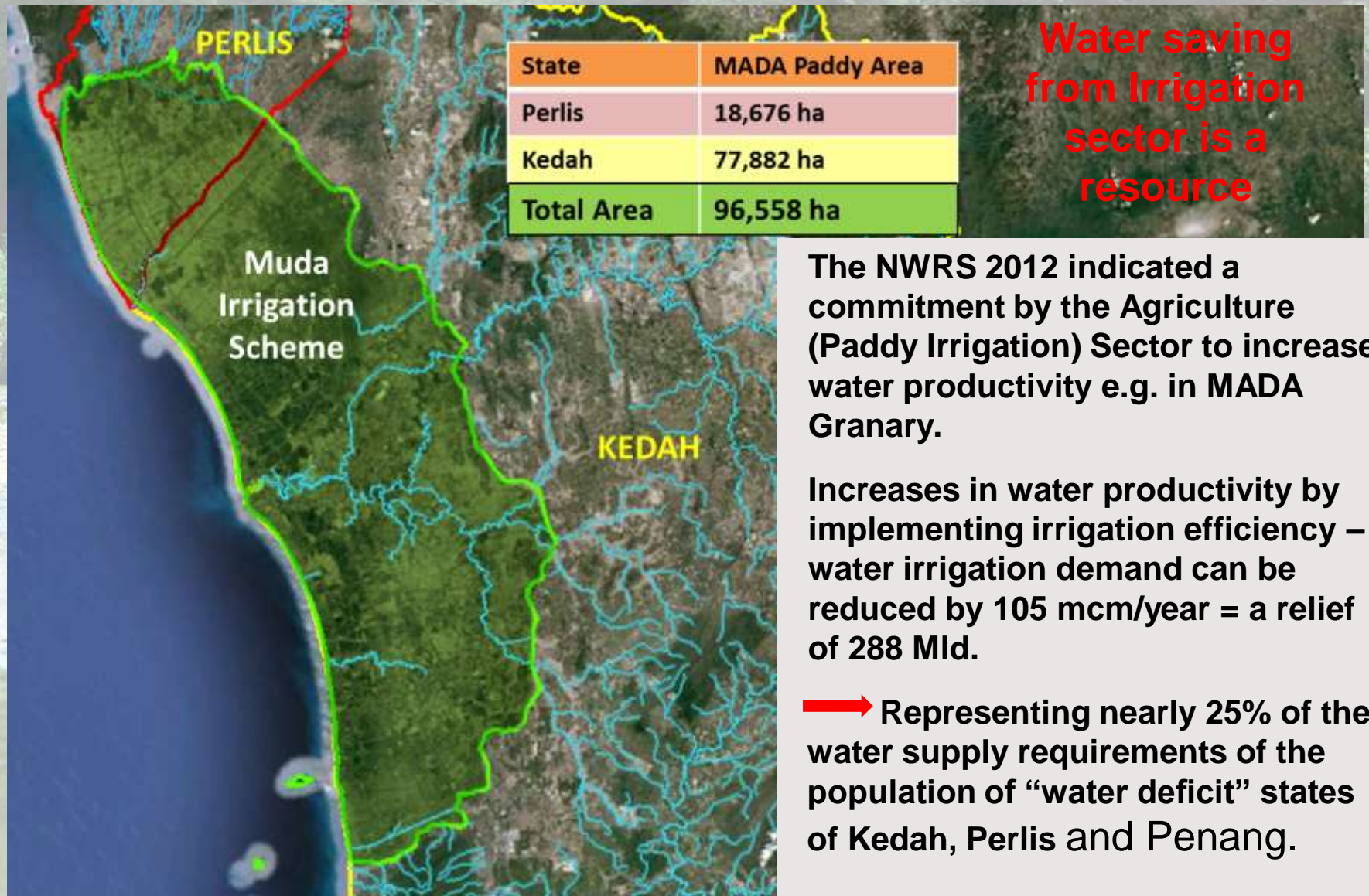
As an example, total potential augmentation from bio-mass effluent for Selangor, FTKL and Putrajaya is estimated to reach 24.5% of total demand in 2020.

Year 2020	
Total estimated potable water demand for Selangor, KL and Putrajaya	4,896 Mld
Total estimated effluent water available for recycling (source IWK estimated)	1,200 Mld
Percentage of water recycled	24.5%

Water Demand Management Study (ASM)

Preliminary Outcomes

(4) Water Resources Management still Sectoral



Location Plan of Muda Irrigation Scheme

Water Demand Management Study (ASM) Preliminary Outcomes

(5) Water Resources still not integrated



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- **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

(6) 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 written, the service level must match the tariff impose
- All Sectors should aim for cost recovery



Terima Kasih