NATIONAL WATER RESOURCES POLICY – SECURITY AND SUSTAINABILITY OF WATER RESOURCES AS A NATIONAL PRIORITY

By

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It is ironic that only after more than a hundred years of "institutionalised" public development does the country finally has a specifically written National Water Resources Policy (NWRP). "The NWRP which was officially launched on 24th March 2012 asserts that "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".

To obtain an insight on the sustainability and security aspects covered in the NWRP and the future of water resources management in Malaysia, JURUTERA interviewed Y. Bhg. Dato' Ir. Syed Muhammad Shahabuddin, who has had 49 years of experience in the water industry covering projects in water resources and water supply, drainage and irrigation, and sewerage in Malaysia, Brunei Darussalam and Singapore. He promoted the practice of integrated Water Resources Management (IWRM) amongst the Government, NGOs and public spheres through Malaysian Water Association (MWA) and Malaysian Water Partnership (MyWP) activities.

He was actively involved in the preparation and submission of the report on National Water Resources Study (2000-2050), which was completed in 2000 (and subsequently revised in 2010). As a member of the National Water Services Commission (SPAN), he is enthusiastically involved in the water and waste water services industry, particularly relating to economic and technical regulations set by SPAN. Currently, he is involved in the Water Committee of the Academy of Sciences Malaysia as the Chairman of the Task Force on Water Demand Management.

Y. Bhg. Dato' Ir. Syed Muhammmad Shahabuddin commended the inception of the NWRP, but noted that the policy was somewhat hastily prepared and, understandably, some aspects of water resources, such as environment flow assessment, are not well covered.

Yet, at any rate, it is now available as a reference and guide to all stakeholders involved in the governance of water resources, serving as a concrete beginning towards effective implementation of sustainable management and development of national water resources.

SECURITY AND SUSTAINABILITY FROM THE NATIONAL WATER RESOURCES POLICY'S PERSPECTIVE

NWRP put forth four key core areas, including Water Resources Security and Water Resources Sustainability. From the aspect of Water Resources Security, the policy addresses areas where water resources must be secured to ensure their availability to meet the needs and demand of both man and nature, through optimisation of their potential and minimisation of damaging impacts.

The policy direction for Water Resources Sustainability sets the fundamentals for adoption of uniform criteria for water resources characterisation, which will lead to strategic direction of prioritisation for allocation and equitable use, taking into account needs in times of crisis or threats. Based on clear methods, the following are the required measures that will prioritise and set forward plans for conservation and use that can better value water resources :

- To ensure no wastage or inappropriate usage or misuse ;
- To ensure optimum yield and quality through measures that will ensure that thresholds and capacities are not exceeded ;

- To rehabilitate degraded resources.

WATER RESOURCES DEVELOPMENT AND MANAGEMENT IN MALAYSIA

Malaysia is rich with water, richer than many other countries in the world. The latest review of the national water resources indicates that the nation receives 970 billion cubic metres of rainfall annually that generate more than 494 billion cubic metres of surface water and recharge the groundwater reserves with more than 60 billion cubic metres of water. Regionally, however, the situation is not as positive. The states of Perlis, Kedah, Pulau Pinang, Selanger and Melaka are already facing uncontrolled water flow deficits that border on unsustainable development conditions as shown in Table 1.

Table 1 : Functions and challenges of project management

States	Land Area	Total Consumptive Water Demand (mm)					Effective rain	Excess / deficit (mm) – Unregulated Flows				
	sq km	2010	2020	2030	2040	2050	(mm)	2010	2020	2030	2040	2050
Perlis	**821**	**372.3**	**364.2**	**348.0**	**345.5**	**343.3**	**71**	**(302)**	**(294)**	**(277)**	**(275)**	**(272)**
Kedah	**9,500**	**307.6**	**313.2**	**299.1**	**302.4**	**302.8**	**113**	**(195)**	**(201)**	**(187)**	**(190)**	**(272)**
Pulau Pinang	**1,048**	**729.4**	**791.3**	**797.5**	**834.4**	**853.2**	**120**	**(509)**	**(671)**	**(677)**	**(714)**	**(733)**
Perak	21,035	92.7	91.6	85.5	85.6	86.1	140	47	48	54	54	53
Selangor	**8,396**	**266.6**	**296.6**	**306.0**	**328.7**	**348.0**	**114**	**(153)**	**(183)**	**(192)**	**(215)**	**(234)**
Negeri Sembilan	6,686	51.0	54.1	53.6	54.7	56.0	74	23	19	20	19	18
Melaka	**1,664**	**193.9**	**220.1**	**225.9**	**246.0**	**263.4**	**86**	**(108)**	**(135)**	**(140)**	**(161)**	**(178)**
Johor	19,210	37.2	45.8	53.8	60.6	67.7	171	134	125	117	110	103
Pahang	36,137	20.1	26.2	24.8	25.2	26.5	165	145	139	140	140	138
Terengganu	13,035	67.8	74.8	74.4	76.7	78.7	254	186	179	179	177	175
Kelantan	15,099	108.1	107.2	105.0	106.0	106.2	176	67	68	70	70	69
Pen Malaysia	**132,631**	**96.5**	**103.1**	**102.2**	**105.9**	**109.2**	**159**	**62**	**56**	**57**	**53**	**50**
Sabah	73,631	12.4	18.4	18.9	19.6	20.0	177	165	159	158	157	157
FT Labuan	91	197.7	264.3	285.0	304.0	318.0	323	125	58	37	19	4
Sarawak	124,450	8.4	17.3	17.0	17.5	18.0	221	212	203	203	203	202
East Malaysia	**198,172**	**10.0**	**17.9**	**17.9**	**18.4**	**18.9**	**269**	**258**	**251**	**251**	**250**	**250**
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**
Note : Water Deficit States in bold.												

Source : NWRS 2000-2050

As a developing country, water resources development and management in Malaysia has mainly focused on supply and a sectoral approach, rather than demand and integrated management. The sectoral approach, as opposed to the integrated approach, thrives well in situations when water is so plentiful and where, overtime, the respective responsible institutions gain dominance in water management. This situation should now change.

As the country rapidly approaches a developed nation status, there is a need to shift the emphasis of water resources management from Supply Management to Water Demand Management (WDM). Instead of meeting the needs of its sectoral users, the development of water resources by each sector should also ensure that the needs required by each of the other sectors can be met, in order to achieve high productivity of water use from the developed water resources for overall sustainable development.

The need to shift the emphasis is becoming more urgent with several highly developed river basins becoming severely stressed such as in the Muda River, the Klang River, and the river basins of Cameron Highlands. There is a possibility that more river basins such as the Muar River, the Perak River and the Johor River would face similar situations as the current regional development programmes gain momentum.

There appears to be a threat of water shortage situations mainly due to unsustainable land and water use practices, which have contributed to the degradation of the water resources base and undermined the primary investments in water supply, energy and irrigation infrastructures, often contributing to the loss of biodiversity.

CURRENT CHALLENGES IN WATER RESOURCES MANAGEMENT

The water supply and agricultural sectors are the two biggest developers and consumptive users of water resources. The other landing developers but non-consumptive water users are the energy (hydropower) sector and flood management. The capability to exercise control over the water resources, its allocation and distribution by all these water developers and managers is as indicated in Figure 1. Their facilities also permanently change the natural water regimes that directly influence another important but non-consumptive and passive (not in control) water user, the environmental sector. This also includes downstream users such as those involved in water contact sports, leisure, tourism, fresh water fisheries, and so forth.

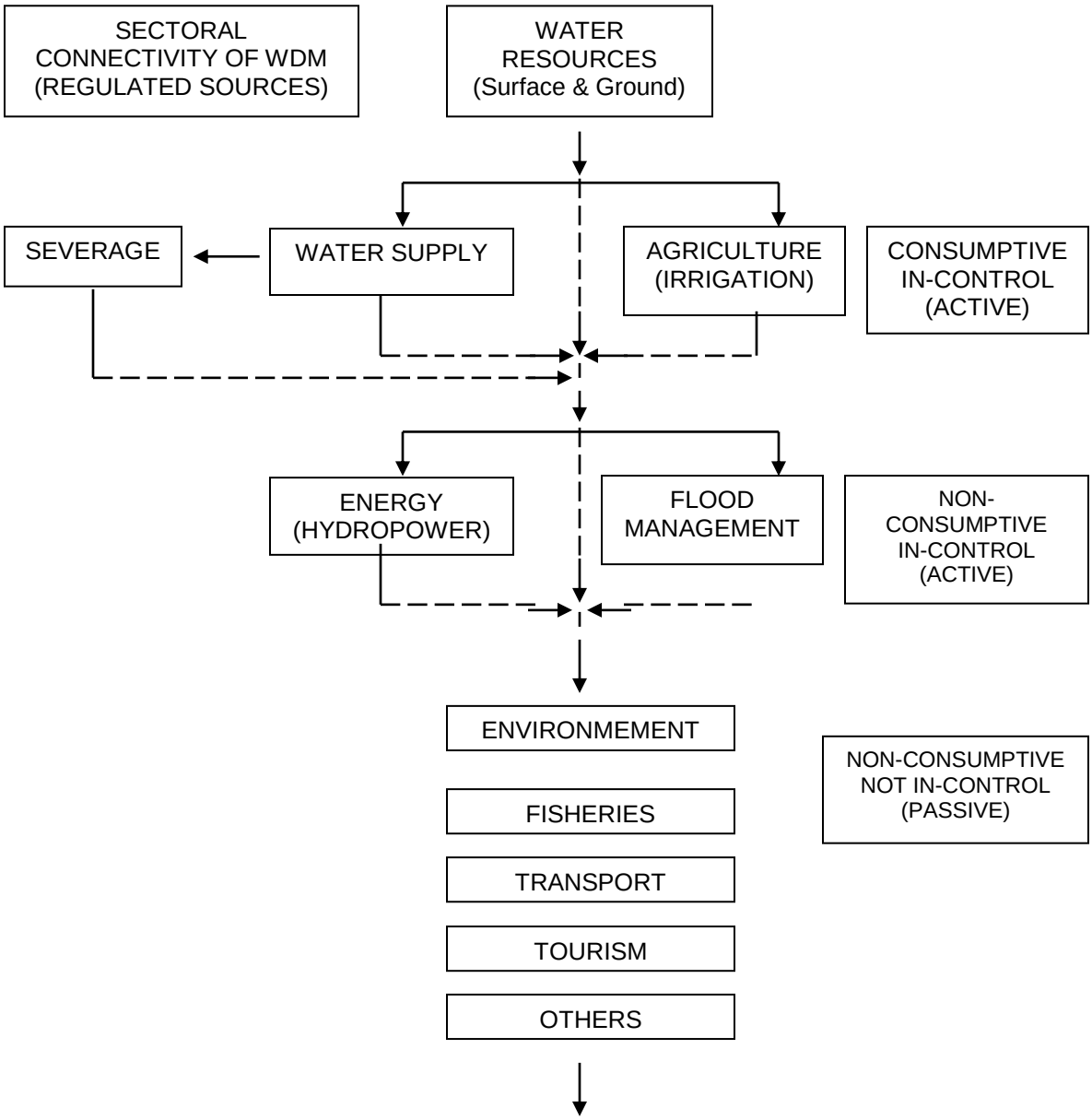

Figure 1 : Sectoral Connectivity of Water Demand Management (Regulated Sources)

With the country's rapidly changing and expanding economy coupled with the growing population, these sectoral demands will inevitably increase considerably over time. Simultaneously, the other non-water based sectors such as water transportation, tourism, and providers of recreational and sporting facilities, will exert increasing pressures that would limit the 'exclusivity' of water control by the present dominant water sectors. The pressure to share water and water resource facilities will undoubtedly be more forthcoming in the future, more so when excess unregulated flows are projected to decrease steadily towards 2050.

At this point in time, it is obvious that the environmental sector is exposed and vulnerable to the operational rules and management priorities of those dominant sectors, owing to the absence of any formal institution and specific authority in the environmental sector to manage its own water requirements and demands.

As there is no distinct or specific water manager for the environmental sector in this country at the present moment, it is vital for the dominant water sectors to be fully aware of the importance of the environmental aspects of water resources management when planning their sectoral interests. This should be the case until the environmental sector has its own manager for environmental flows.

WATER DEMAND MANAGEMENT INITIATIVES

The policy's direction for Sustainability of Water Resources has set a target to adopt measures to implement Water Demand Management (WDM) nationwide by identifying options to incorporate WDM in regulatory and administrative arrangements. WDM can be defined as any socially beneficial action that reduces water usage or consumption from either surface or any other sources. This traditional approach of developing new sources of supply to meet the additional demand has caused overuse of available resources, wastage and expensive schemes. This approach has been the popular practice in the country until today.

Generally, the objective of WDM is basically to obtain a commitment by each sector to share water resources and agree on sectoral allocation, management and operating rules in an integrated manner through IWRM. Subsequently, each sector will have to implement its own WDM based on the agreed allocation and rules, and even commit to implement measures that could relieve the other sectors of water demand pressures by their major end-users or beneficiaries. This raises the issue of the appropriate authority that will obtain the commitments on equitable sharing of water, and it has to be a Government Agency at State level.

WDM has always been a subject within the water supply and agriculture (irrigation) sectors but not in other sectors such as hydroelectric generation and flood management. However, WDM has never been completely implemented because the practice has been mostly sectoral driven. Inter-sectoral Water Resources Management towards full implementation of IWRM is almost non-existent.

WDM within a sector has been practised with varying amounts of success. For the water supply sector, the key objectives are to reduce Non Revenue Water (NRW) and reduce, as far as practicable, per capita consumption. For the agricultural sector, WDM focuses on increasing water productivity in terms of kilogramme of rice output per cubic metre of water supplied (kg rice / m^3 water). For the energy (hydropower) sector, there is yet to be a widely accepted water productivity parameter, but perhaps kilowatt energy produced per cubic metre of water could be considered.

USE OF ALTERNATIVE WATER RESOURCES AND SOURCES

There is compelling evidence that Malaysians at large use much more water per person per day at the domestic level (an average of 203 lcd for the whole country based on Malaysia Water

Industry Guide 2011) ; more than in countries such as Singapore (about 160 lcd) which are more water efficient. Per capita domestic daily usage in selangor is 239 lcd (Malaysia Water Industry Guide 2011) and Pulau Pinang is 291 lcd (Water Industry Guide 2011).

NWRP opens up the opportunity to explore the use of alternative sources and to optimise options for conjunctive or contiguous use of different water resource types to reduce stress on existing sources for security and sustainability.

Groundwater can provide the most immediate solution but much more work has to be done especially on exploration and exploitation of groundwater. It is estimated that less than one percent of current water demand is met by groundwater in Selangor. It is unlikely that groundwater can be alternative supply surface water due to the economics of production and reliability. However, it could be developed for localised supply supporting small water demands. It has better water quality and hence, lower treatment costs.

In the non-domestic water supply sector, recycling has yet to be explored to sufficient depth and extent, particularly for industrial areas and highly developed urban areas, as well as for intensive agro-based activities, such as in palm oil production. It is pertinent to encourage innovative ideas on recycling and reuse of water for non-domestic use in urban development including for industrial needs with reasonable subsidies. This is also in line with the government-supported Green Technology concept of development. Rainwater harvesting should be encouraged, particularly in large commercial buildings and complexes (with large ground storages) and also in housing areas with necessary subsidies.

FUTURE OF WATER RESOURCE MANAGEMENT

It is not difficult to get a consensus that biodiversity is necessary for sustainable development. The environmental aspect in water resource development is also a critical development issue because of its many links to sustainable growth in downstream communities, including health, agricultural productivity, and many other social benefits such as tourism, which is a source of wealth creation. The adequacy of groundwater recharge should be taken as an important environmental aspect to ensure that our future water resource needs are met. All the above-mentioned examples require adequate water, in terms of quantity, quality and timing, for sustainability.

The Academy of Sciences Malaysia, as an independent institution of academicians, has taken the initiative to identify water as a critical resource for the nation's sustainable growth, focusing special attention particularly from the perspectives of science, technology and innovation. With the provisions of the NWRP in mind, a programme for strategic consultation has been arranged for the next one year to shift the attention from supply-based sectoral management to demand management (on an inter-sectoral basis).

We have to accept the fact that there is, at the moment, lack of a consistent policy on how to manage our rivers for both human and ecological benefits. Rivers need environmental flow. There is a need for the development of tools and methods to allow planners, implementers, managers and operators to make decisions on water use and water resources, based on the best available science to balance the needs of competing users.

The role of the science community and responsible experts such as engineers, hydrologists, ecologists, environmental economists and scientist, is important to balance the debate and bring science-based decision-making into the process in order to advise the Government on the future approaches, and development of a good policy for water and water resources.