Water security and its challenges for Malaysia

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Abstract. Water Security in Malaysia is a national issue. The Malaysian water services industry faces issues which need to be tackled immediately for it to be viable and sustainable. Among them are the decentralized water services sector, ineffective governance structure, unsustainable tariffs, huge investments required to develop the water supply and sewerage infrastructure, inefficient operation by the operators and high non-revenue water (NRW) losses. In Malaysia, the “Sectorial” approach embedded in the present water management system and its transformation towards “Integrated Water Resources Management” (IWRM), is still in a state of inertia. This paper presents the need to transform, from a “Supply” Management mode (a characteristic of a developing country) to a “Water Demand” Management mode (a characteristic of a developed country). Issues on “Water Demand” Management for the Environment which can be a threat to the need for sustainable development for biodiversity are highlighted here. Reliable water accounting systems are found still lacking in this country, especially in the Agriculture and Environmental Sectors, where figures are still highly based on “traditional” assumptions. Water Quality deterioration remains an issue especially for the Water Supply and Environment Sectors. Available surface water resource is depleting in many regions and states in the Peninsular. Apart from the Reduce, Reuse and Recycle (3R) option for surface water, another option would be to begin a concerted effort for groundwater exploitation. However there are still grey areas of knowledge in the groundwater resources in this country for affirmative decisions and development of appropriate policies. It is also found that, there are no concerted plans to prepare the public for the change from “Supply” Management to “Demand” Management. In a developed nation, this change is through stakeholder platforms and supported by appropriate policies, rules and regulations that are based on validated Sciences, Technologies and Innovations (STI). Transforming from “Supply” Management to “Demand” Management is a formidable task. This requires the wisdom and knowledge of all experts in the Water Resources Sector.

1. Introduction

Water Security is an emerging concept which has gained increasing attention over the past five years. In 2009, the World Economic Forum described Water Security as the “gossamer” that links together the web of food, energy, climate, economic growth and human security challenges that the world economy faces over the next two decades” [1] as illustrated in Figure 1 below.
Water Security is defined as “sustainable access on a watershed basis to adequate quantities of water, of acceptable quality, to ensure human and ecosystem health”. This definition sets baseline requirements for water resources management in a watershed on a continuous basis. There must be an access to adequate quantities of acceptable quality of water for both humans and the environment. Water Security takes a broad look at all demands placed upon a watershed, including quality, quantity (including climate change and allocation), aquatic ecosystem health, human health, risk and adaptive governance.

2. Background
The 5th World Water Forum (WWF) held in Istanbul in 2009 with the theme of “Bridging Divides For Water” ended with mixed conclusions and showed a significant divide in opinions. But the true scope and urgency of the world water crisis became recognized and many engaged to solve water related issues. Water scarcity is among the main problems to be faced by many societies around the world in the XXIst century. Furthermore, water resource management is administratively complicated because it involves legal, environmental, technological, economic and political considerations.

3. The Need for Water Demand Management (WDM)
In Malaysia, WDM for a Developed Nation is in line with the Government Transformation Plan (GTP) launched in January 2010. The notion is to accelerate the pace towards the country’s Vision 2020, to be a fully Developed Nation. The key-essentials of this GTP is to improve the service levels, deliveries (People first) and productivity improvements (Performance now). Within this strategy is also the goal for the society to be a scientific and progressive society, contributing to the scientific and technological civilisation in the future. Concurrent with the GTP, is the country’s Economic Transformation Plan (ETP) that sets the ambition for the country to be a High Income Nation as a fully developed country. Is the present state of the water resources management in the country able to support the GTP and realise the goals of the ETP? Is the Water Resources Sectors prepared and able to respond to meet the needs of the people and characteristics of a fully developed Nation?
4. Water Demand Management (WDM)

Is WDM vital for a developed Nation Status? This is currently the most pressing global issue related to the environment, society and technology. Water, being within the ambit of the environment, is important because it is linked to the food production. WDM for Agriculture accounting to about 70% of water use and the remainder is for potable water and other uses. To secure food, water supply and distribution, usage or demand of water has to be adequately managed and shared in what is termed as WDM. WDM means reducing the use of water and wastage by better management rather than just providing more supply. Figure 5 illustrates the importance for Malaysia to embark on an effective WDM throughout the country. Table 1 shows statistics on deficit amount of unregulated flows in all states of Malaysia and an increase trend of Total Consumptive Water Demand till 2050.
5. Water Demand Management for Non-Potable and Industrial Water Users

It does not make economic sense to supply Potable Water to users who only need Non-Potable water in the water supply system. Furthermore, the supply is subsidised by most of the State Governments concerned. This water supply system has been in practice since public water supply was introduced over 200 years ago and until the 1980s. However, with changing situation over the past three decades, where in some industrialised areas like the Klang Valley and Penang, the percentage of industrial usage is appreciably high and close to 40% [2, 3]. As agreed by the Heads of States including Malaysia at the recent Rio+20 forum, there has not been much progress in IWRM over the past 20 years. We continue to be bounded by the “Sectorial” approach - the main reason for the persistent issues of water management in this country. WDM requires commitment of sectors to resolve inter-sector needs and allocation. Results of the current WDM practised over a period of more than 30 years have not been encouraging. In Peninsular Malaysia, the lowest and most successful in Non-Revenue Water (NRW) is Penang with 18.2% and the highest is Pahang at 55.3%. Overall, the NRW exercise has not been successful. One possible reason is that the current tariff is too low, uneconomic and needs revision. The low tariff does not encourage new innovations in water reduction technology and runs against the aspirations of Green Technology.

6. Conclusion and Recommendations

Tariffs, pricing, sectorial water management are policy issues that need to be resolved in the water industry of Malaysia. We also need Science, Technology and Innovation (STI) to survive and prosper where knowledge and technology are ready and available here when needed. In Malaysia, are we investing and putting in enough efforts in STI? Are we waiting for a disaster to justify efforts in STI? Are we bounded by the maxim “Necessity is the Mother of Invention” and there is no necessity now? Proposal deliberated and recommendations made in this paper will need to be further studied and pursued in the interest of nation’s WDM for sustainable development and wealth creation.

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References

[1] World Economic Forum Annual Meeting Report 2009 Davos, Switzerland at http://www.weforum.org/sessions/summary/global-agenda-2009-view-davos
[2] JPS 201 Review of National Water Resources Study (RNWRS) 2000-2050 Report
[3] SMHB Sdn. Bhd. 1999 National Water Resources Study (NWRS) 2000 – 2050 Report