

Meeting Water Demand for Industrialising Malaysia

By

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1. Introduction

The Government's long term objectives for the water industry are to identify and develop adequate water resources for all users, preserve and protect the quantity and quality of existing resources as well as to identify and conserve potential water sources to meet future needs.

We are all aware that water is one of the most crucial elements in developmental planning. As Malaysia prepares herself to become a fully industrialised nation by 2020, efforts to develop, conserve, utilise and manage this important resource have to be guided by national perspectives, and on an integrated and environmentally sound basis.

To keep pace with the anticipated increasing demand for the years ahead, it is vital for future water supply development to remain dynamic. Water supply development in the subsequent years to come will have to be further accelerated to meet the rapid growth in population, industries, tourism and other economic activities.

Against this backdrop, the government had recognised a need to reassess priorities in the Water Sector as failure to do so will lead to shortages, competition, rising pollution and other environmental pressures. Hence to ensure that the nation will have an adequate supply of clean water available to support a variety of users, the government had pledged its commitment for a long term sustainable development of the water sector as laid out under the main thrusts for water projects to be implemented during with the 9th Malaysia Plan and beyond.

2. **Main Thrusts of the Water Sector**

The main thrusts of the Water Sector is a commitment to **sustainable development** for the nation's water resources to be managed properly and holistically. The concern on sustainable development focuses not only on the needs of this generation, but also on our responsibilities to those who follow.

To carry out the programme an important documents had been developed in year 2000, i.e. the draft **National Water Resources Study (Peninsular Malaysia) (NRWS), 2000** which covers the planning horizon up to year 2050. This document has been reviewed and expected to be completed at end of 2010 in response to the evolving conditions and are essential to update demand projection, CAPEX requirements and to improve coordination and integration of water resources management.

Long term sustainability of our water resources development is needed if Malaysia is to succeed as a fully industrialised nation. This objective is now being reflected in the proposed draft National Water Policy for the future which would exhibit the following general features:

In terms of Policy

- i. To have an integrated water resource management regime that extends from regulating raw water resources from rivers and underground to discharging treated waste water back to rivers.
- ii. The development of a holistic National Water Policy for Malaysia under Federal and State Government initiatives.
- iii. To place services management in the forefront of public policy taking into account the importance of climate change and its impact on the environment as well constraints in funding sustainability in Malaysia.

In terms of Governance

- i. A National Water Resources Council (NWRC) was established in 1998 with Federal-State involvement that ensures all aspects of water resources development are placed on the state and national agenda for consultation, coordination and action supportive of national development aims
- ii. The water services requires a new industry model that can transform the industry to a long-term sustainable operating model without undue constraint to public funding
- iii. Reforms needed to achieve long-term sustainability in the water industry sector with the establishment of National Water Commission and the enactment of the enabling legislation, the Water Services Industry Act 2006.

In terms of Planning

- i. A Water Resources Master Plan (including a plan for managing existing assets), periodically updated, that will form the basis of future water sources development and management;
- ii. A clear policy on source management pertaining to the need for conservation and preservation of future dam sites; and
- iii. A firm policy on water quality control, monitoring criteria and standards including strategies for protection of watersheds, control of point and non-point pollution, control of wasteful use and a general precautionary approach to the assessment of development externalities.

In terms of Management

- i. A clear-cut responsibility in demand management to achieve reductions in metered water usage and non-revenue water;
- ii. Application of user-pay principles in a transparent situation and high standard of reliability in meeting water demands; and
- iii. A major role for the private sector in the delivery of services to the sector and for the development of new sources.

In terms of Regulation

- i. Federal Constitution has been amended to regulate the water services industry at the Federal Level with the enactment of the Water Services Industry Act 2006 and the National Water Services Commission Act 2006,
- ii. There will be an increasing need for independent economic regulation of private sector involvement in the water sector, in order to protect public interest and consumer's rights.

3. Challenges

- i. In tandem with physical construction, the government hopes to continue to make substantial progress in tackling issues that it has identified and are important to be addressed in the wake of implementing the development of water supply. Besides challenges pertaining to institutional reforms and privatization, among others, there are three main challenges highlighted here below:-

- (a) Natural Resources Degradation

(b) Water Resources Development

(c) Pricing Policy

3.1 Natural Resources Degradation

Water Quality

Water pollution adds enormously to existing problems of local and regional water scarcity by removing large volumes of water from the available supply. In many developing countries including Malaysia, only a fraction of the population is covered by sewerage systems. As a result, water bodies are often the recipient of raw sewage from domestic and industrial sources.

Many developing countries, including Malaysia, undergoing rapid industrialisation are now faced with the full range of modern toxic pollution problems: eutrophication, heavy metals, acidifications and organic pollutants. Analysis indicated that rivers in general exhibit increasing degradation trend and this is particularly noticeable in rivers which flow past urban and industrial areas.

The challenge here is therefore to meet the need to address the issues of environmental degradation and prevent further destruction. This could be properly addressed by the adoption of appropriate institutional infrastructure that will ensure a coordinated development and management of water, land and related resources to optimise economic and social improvement without compromising sustainability of environment systems.

Water Shortage

Water supply shortage normally happened during periods of prolonged drought, which in Peninsular Malaysia, can last up to 4 months sometimes. Water shortage can be aggravated by pollution due to uncontrolled developments adjacent to rivers and waterways. During low flows, water quality is adversely affected due to insufficient dilution and this can give rise to a situation whereby raw water is difficult or uneconomical to treat. Therefore, water supply intake sites may have to be moved further upstream thus limiting the availability of water to satisfy demand.

Some solutions to overcome this include, firstly, regulation of water resources by some form of storage will undoubtedly ensure reliability of meeting future water supply demands. This will encompass feasible transfer of water from water-rich states to water-deficit states under inter-state water transfer schemes.

Secondly, effective demand and operation management of water supply will produce considerable amount of saving of water; a very important consideration is to have the water supply and demand balancing in the long-term growth. Demand and operation management practices should include:

- i. Decreasing non-revenue water particularly in major urban and industrial water supply systems in all states;
- ii. Reducing the use of water by introducing water saving devices in buildings;
- iii. Discouraging excessive use of water and wastage by introducing a Tariff Policy to reflect the actual cost of developing water resources and supply systems;

- iv. Reducing the quantity of industrial water use by recycling the water.

3.2 Water Resources Development

Integrated Water Resource Management

Integrated water management approach requires close co-operation and partnership between stakeholders, including Governments, independent regulatory authorities, water suppliers local public officials, health agencies, environmental agencies, land users, contractors, plumbers and manufacturers of relevant materials products, and consumers themselves.

Water Sources Works Development

New water resources development projects, including construction of new dams to form impounding reservoirs, have to be identified for inclusion in the Master Plan for new source works required for the augmentation of water supply over the next 50 years.

It is vital that the identified sites for dams and their catchment areas be gazetted as water catchment areas. The conservation of the proposed dam sites proposed under the National Water Resources Study (2000) is essential not only to ensure that source works can be implemented according to plan but also because there may not be any other suitable alternative sites available for dam construction.

Capital Costs of Water Sources Development

The peninsula-wide investment requirements for source works over the period up to 2050 is estimated to be RM52 billion.

Priority projects for the initial 10-year period of implementation will form bulk of the required capital investment.

3.3 Pricing Policy

With the growing scarcity of water, it has become necessary to recognise that water is an economic good that has an economic value. In Malaysia, where water is still generally regarded as a social good, the concept of full cost recovery is relatively new. Government subsidies are common and tariff is artificially maintained at a very low level. Full cost recovery is also not observed because of sociopolitical considerations.

The absence of established economic regulation only complicates the problem. Very often, increasing tariff to cost recovery levels is met with resistance. This result in water utilities that are not able to comply with its service obligations.

Most water utilities are already facing the problem of not having enough revenues to cover operations and maintenance costs; let alone the cost for improving the service and expanding its coverage area.

Given the highly capital-intensive nature of the sector, more private investment are required to remove the fiscal burden from the Government. The need to set tariffs that actually reflect full cost recovery is the most appropriate approach to attract private investments.

Balancing full cost recovery and users' ability to pay is crucial in any privatisation exercise. Success may be achieved if the capital investment cost can be kept as low as possible and the tariff fixed at economic value.

The current pricing systems for domestic and non-domestic water supplies in the various States would have to be gradually revised to more closely reflect the actual costs of developing water resources and supply facilities. Water pricing policies are also expected to move towards those of the developed nations.

4. Malaysia's future Water Demand

The present total treatment plant capacity in the country is 16,283 million litres per day (MLD) which has grown from 346 MLD in 1959., representing an average of 319 MLD annual increase in the last 42 years. This production capacity is sufficient to meet the current demand of 13,506 MLD. The present water supply systems serves 96.6% of the urban population and 86.4 % of the rural population. The overall coverage is 92.9 %.

Long term projections of water demand are necessary in order to quantify requirements for future needs, and for development of new water resources, protection of potential catchments areas and rivers and for design of treatment facilities and distribution works.

The key components of demand for water supply include water consumption by the domestic, industrial, commercial and institutional sectors. In addition to this, the total amount of water that needs to be produced, and hence the total water demand includes provisions for water lost as a result of leakages between the source (treatment plant) and end users of consumers.

4.1 Population Growth and Migration

Malaysia, like the rest of the world, is faced with a growing population. The population of Peninsular Malaysia will be more than double its size from 18.1 million in 2000 to 38 million in 2050 as reported in the National Water Resources Study (2000).

Population growth and socio-economic development are currently driving a rapid increase in water demand. Rural to urban migration is also evident with a relative large number of the population concentrated in urban areas where high economic activities exist. The rapid growth in population, increasing economic development and improvements in the standards of living resulted in increased demand for water supply. Consequently there is tremendous pressure on an already threatened urban environment and natural reserves as well as the services.

The challenge here is not only to provide adequate water for the increased demand but also to stimulate development in rural areas to relieve migration into and lessen pressures in the urban areas.

4.2 Water Demand

From the National Water Resources Study, domestic and industrial water demand for Peninsular Malaysia will increase 3-fold from 9543 Mld (3483 million m³/yr) in 2000 to 31,628 Mld (11,543 million m³/yr) in 2050. By 2020, it is expected to increase by 2-fold.

On a Peninsular Malaysia-wide basis, during periods of severe drought, the average natural or unregulated flows can barely meet the planned demand in 2050 of 31,628 Mld. Several dams form impounding reservoirs have been identified for new source works required for augmentation of water supply over the next 50 years.

4.3 Per Capita Consumption

Per capita consumption for domestic, commercial and institutional water users in all States in peninsular Malaysia has shown steady increases in recent years.

Generally, an increasing trend in per capita consumption of domestic, commercial and institutional uses has been projected to the end of the planning period in 2050. Under normal circumstances, beyond the mid-term period to say 2020 or 2030, the country is expected to move into the post-industrial era, when the trend in per capita consumption could decline closer to that currently occurring in industrialised countries. However, for forecast, it was decided to adopt a conservative approach by assuming per capita consumptions that increase at declining rates.

Of the total consumption, domestic forms the highest quantity for user category in Peninsular Malaysia. This is followed by industrial and commercial consumptions. Institutional consumption is the lowest category.

5. Conclusions

- i. The governance structure of water resources must be established in order to implement integrated water management approach effectively where the participation will include all stake holders. Stake holders along the entire water cycle chain need to understand the respective roles they have to play to achieve the common goal.
- ii. Current and projected population growth and industrialisation give rise to increasing demand for water for drinking and sanitation, commercial and industrial use, recreation and aesthetic enjoyment of water

courses. Demand for domestic and industrial use is expected to increase by an average of 4% up to year 2050.

- iii. This in turn has prompted the government to resolve in putting into place plans to implement a holistic approach to water development and management.
- iv. Specific actions pertaining to water demand management would need to be taken particularly on reducing leakages and non-revenue water, raising public awareness on water conservation and use of water saving devices.
- v. While the government (and private companies) will draw up several water infrastructure projects that will be implemented in the near future, the question of environmental consideration should not be neglected. All parties that are committed to developing the sector should incorporate these aspects into their corporate planning to achieve a synergy between environment and economic development.
- vi. Less damage done to environment will ensure the sustainable development of the water supply sector as well as ensuring that water supply is both reliable and affordable to meet the needs of an industrialized and developed Malaysia.