

MALAYSIA'S EXPERIENCE IN INTEGRATED RIVER BASIN MANAGEMENT

Ir Lee Chock Seng

*Director of River Engineering Division,
Department of Irrigation and Drainage,
Malaysia*

BACKGROUND

It has been estimated that Malaysia has an annual rainfall of about 990 billion m³ (3000mm annually), of which 360 billion m³, or 36% returns to the atmosphere as evapo-transpiration, 566 billion m³, or 57% appears as surface runoff and the remaining 64 billion m³, or 7% goes to recharge groundwater. Of the total 566 billion m³ of surface runoff, 147 billion m³ is found in Peninsular Malaysia, 113 billion m³ in Sabah and 306 billion m³ in Sarawak. The availability of water is uneven in both space and time.

The increase in population coupled with the growth and expansion of the economic activities inevitably lead to increasing demand for water for diverse purposes: domestic, industrial, and agricultural use, hydropower, navigation, recreation, etc. In 1998, the irrigation sector accounts for about 68% of the total consumptive water. The Government will continue effort to ensure the target of 65% self-sufficiency of rice to be met.

The Government also plans for adequate drinking water to be provided to the entire population in both urban and rural areas by the end of 2010. The demand for water for hydropower and thermal power generation and for other industrial uses is also likely to increase substantially. As a result, water that is already a scarce resource in certain regions will become even scarcer in future.

Flood is a negative aspect of water resources. Flooded areas mapped from the recorded maximum flood events since 1963 amount to about 29,000 sq. km, some 9% of the total land areas in Malaysia. Flood damage costs have increased with time due to the growth of prosperity and wealth in the flood-prone areas. Water shortage, rarely happened in the past, now occurs quite often in some urban areas especially during prolonged droughts. The increased demand has far outstripped the supply.

Serious environmental problems have slowly crept in in many river basins of Malaysia today. Many rivers have a very low water quality. Sediment levels are high, garbage floats and rots in the river and the water is polluted with heavy metals, toxic chemicals as well as domestic and farm waste. The catchments are also degrading leading to loss of biodiversity in upstream areas as well as downstream areas.

The causes of the above problems are wide-ranging and complex. They are intricately associated with changing value systems, the dynamics of socio-economic and political progress in Malaysia as well as a range of deeply rooted institutional constraints. A major cause is that the river basins are currently managed in a fragmented way and the management and enforcement powers are vested with numerous agencies. Upstream and downstream concerns are not integrated. Efforts to address the visible problems are often curative rather than preventive.

GLOBAL COMMITMENT AND COOPERATION

Malaysia is party to the Convention on Biological Diversity, which urges parties to give priority to conserving freshwater biodiversity and in preparing integrated river basin plans based on the ecosystem approach. Malaysia has taken a lead in the Ramsar Convention on Wetlands and its adoption of guidelines on integrating wetland conservation and wise use into River Basin Management. Malaysia has also been an active participant in the development of the Global Vision for Water, Life and the Environment and on Water Security in the 21st Century at the Ministerial Conference on March 2000.

Under Global Water Partnership (GWP) and the local chapter of the South East Asia Technical Advisory Committee (SEATAC) and the Malaysia Water Partnership (MWP), awareness and capacity building have been initiated through conferences and workshops. The National Conference on Sustainable River Basin Management in Malaysia on 13-14th November 2000 has managed to create awareness among the participants of the importance of IRBM. Malaysia would continue to be involved in similar activities so that awareness could be extended to all stakeholders at all levels and its capacity in implementing further strengthened. Malaysia's active participation in international forums has continually help renew its effort and provide the necessary impetus in pursuing IRBM.

NATIONAL WATER VISION

Facilitated by the Malaysian Water Partnership, national consultations were held between 1999 and early 2000 among the stakeholders with a view to come out with a Malaysian vision for water. The Malaysian Vision for Water to the year 2025 thus formulated is as follows:

“ In support of Vision 2020 (towards achieving developed nation status), Malaysia will conserve and manage its water resources to ensure adequate and safe water for all (including the environment).”

The accompanying Framework for Action contained a set of initiatives based on four main challenges that were identified for a better water future, namely:

- Managing our water resources efficiently and effectively (addressing both quantity and quality aspects);
- Moving towards IRBM;
- Translating awareness to political will and capacities; and
- Moving towards adequate (safe) and affordable water services (befitting a developed nation status by 2020)

This vision has provided direction and focus for all stakeholders. It will help unite all stakeholders to work towards common objectives.

FEDERAL-STATE JURISDICTION OVER WATER

The jurisdiction and legislative powers in all aspects of water are distributed between Federal and State Governments in accordance with the Legislative Lists of the Federal Constitution. These are the Federal, State and Concurrent List. It may generally be stated that “water” is a State matter. This would include rivers, lakes, streams, and water beneath the surface of the land. However, it is certainly not true that water is exclusively a matter within the sole jurisdiction of the States. The Federal Government has specific powers, for example over federal works including water supplies, rivers and canals except for those which are wholly within one State or are regulated by an agreement between the States concerned. The Parliament may make laws with respect to any matter in the State List for the purpose of promoting uniformity of the laws of two or more States. However, if it concerns the restriction of the right of the State to use any river wholly within that State, approval has to be obtained from the State Legislature before it can become effective.

LEGISLATION

There are some 40 Federal laws related to land and water. In addition there are 3 or 4 enactments in each state. A list of the many laws is shown in **Table 1**. These laws generally govern the use rather than the protection of the resources. They are fragmented to suit the sectoral management and use of the resources. Therefore conflicts and overlaps are common. There is a need to formulate new laws which will address the above issues and also the need of IWRM. Three states, namely the States of Selangor, Sabah and Sarawak, have moved ahead in this direction. In April 1999, the State of Selangor has passed an enactment that provides for the formation of the Selangor Waters Management Authority. More recently in June 2000, the State of Sabah has also passed the Sabah Water Resources Enactment 1998 that provides for the formation of State Water Resources Council. These enactments provide for IRBM, where and when required, and the need to prepare supporting Integrated Catchment Management Plans or River Basin Management Plans to steer and monitor development.

ADMINISTRATION

Administration and management of water resources currently involve a number of departments and agencies which operate independently of one another according to the specific responsibilities assigned to them. **Table 2** shows the respective roles of each department /agency.

In the past, there has been no single agency at river basin, State or Federal level entrusted with the overall responsibility for holistic planning and management of water. Conflicts involving water resource allocation, flood management, environmental protection, etc. are resolved mainly through ad-hoc inter-agency consultations. Following the water crisis in 1998, the National Water Resources Council was formed with a view to pursue more effective water management including the implementation of inter-state water transfer. As mentioned earlier in 1999 and 2000 respectively, enactments have been passed to allow for the formation of the Selangor Waters Management Authority and State Water Resources Council. These are important steps towards more holistic planning and regulation of water resources.

The Federal Government is presently taking steps to set up the National Water Board under the National Water Resources Council. There is the option of having a board which will take over almost all the functions related to water resources and one with limited functions. The former is both a tedious and time-consuming process which will involve the amendment of the Federal Constitution and protracted consultations with the State Governments. There were separate attempts to initiate small-scale reorganization of government departments that includes the shifting of departments to appropriate ministries and forming of new ministries. This will to some extent help solve the problems of conflicts and inefficiency and at the same time avoid getting involved in very time-consuming process. The Department of Irrigation and Drainage is pursuing the formation of River Management Committees under its One-State One-River Programme for states which do not have any authorities in implementing IRBM plans.

ENFORCEMENT

Since there are numerous laws with gaps and overlaps and there are also many agencies and departments involved in dealing with fragmented sectoral functions, the enforcement has become ineffective and inefficient. There are cases where agencies are given the responsibilities but depend on other agencies to enforce the relevant laws. Under such circumstances close cooperation with other agencies is necessary and this is always hampered by different priorities and accountabilities. The inadequate penalties and the lack of political will also hamper the enforcement of laws. Even with comprehensive and contemporary laws, the problems of enforcement may still persist especially in areas where enforcement under existing laws has been a problem. There is no guarantee that new laws will solve the problem of shortage of staff and political will.

WATER POLICIES

There is an absence of over-arching national water policy. Current policies on water are sectoral in nature, each covering a different aspect of water utilization, resource protection or pollution control. At the Federal level separate policies are vested with different Ministries. At the State level, respective State Governments have their own sets of policies regarding water abstraction, licensing fees, and watershed management. The National Water Policy is currently being drafted, The general objective of the National Water Policy is to free the nation from water resources constraints, that is, to promote national economic development, to enhance regional development, to upgrade environmental quality and improve social well-being by meeting water resources needs and by alleviating water resources problems. The policy has included guiding principles in water management which are consistent with the Integrated Water Resources Management (IRWM), and hence the IRBM approach.

PLANS AND PROGRAMMES

The 8th Malaysia 5-year Plan (2001-2005), the 3rd Outline Perspective Plan (OPP3) by the Economic Planning Unit and the National Spatial Planning (NSP) under the Town and Country Planning Department have underlined the need for IRBM approach in resources development.

Until recently there has been no formal allocation of funds for implementing IRBM at the national level as this is a relatively new concept and the activity involves a broad range of stakeholders making budget requests or allocation complex. Over the past five years, the Department of Irrigation and Drainage (DID) has carried out studies for six river basins as a first attempt to implement IRBM by using local consultants. There are three on-going IRBM projects being carried out with important input being provided by foreign experts. One such project is the Integrated River Basin Management by Danida

Given the importance of IRBM, Malaysia intends to prepare IRBM master plans for all its river basins. Positive steps are being taken towards such preparation. The Department of Irrigation and Drainage is implementing the One-State One-River Programme with the objective of implementing IRBM, starting with one river for one state. Many departments and agencies have also included elements of IRBM, to different extents, in implementing their respective programmes.

HUMAN RESOURCES DEVELOPMENT

There is no specific training programme for IRBM except through exposures in conferences, workshops and study tours, held either locally or overseas. Currently under the Integrated River Basin Management in Peninsular Malaysia project by Danida, foreign consultants are helping to prepare some training modules in IRBM for junior professionals, junior administrators and technicians.. The consultants are taking an

approach where the locals are expected to get involved actively in the project. This is to prepare the locals to be able to implement IRBM themselves in future.

OTHER IRBM ACTIVITIES AND RELATED PROJECTS

Danida is funding Community Participation in River Management in Malaysia, which is being implemented by Global Environment Centre, the Malaysian Anglers Association, the Centre for Environmental Technologies and the Environmental Action committee, Sabah in cooperation with DID, the Fisheries Department, state governments and local councils. The objectives are to improve river quality and riverine biodiversity status through enhanced community participation in river management. Proposed project sites include the degraded Sungai PENCHALA running through Petaling Jaya and the Kelana Jaya Lakes in Selangor. The project has just started. JICA has also implemented a number of technical projects in river management .

RIVER BASIN INFORMATION

Preparation of IRBM plans depends on the availability of information related to water and land. The Department of Irrigation and Drainage (DID) is in the early stage of developing the National River Basin Decision Support System (NRBDSS). Part of this system is supporting the National Infrastructure for Land Information System (NaLIS), now changed to Malaysia Geospatial Data Infrastructure (MyGDI). NRBDSS is using a locally developed powerful information management system called the MultiCentrix Information Management System. NRBDSS is developed to integrate the various river-basin related IT systems in the country into an effective decision support system to facilitate the integrated management of all river basins in the country. Templates for the River Basin Information Management System, a component of the NRBDSS, have been completed. The successful development of this system depends on the input and continual updating of information from all departments and agencies related to water and land other than from DID.

ALLOCATION OF RESOURCES

To implement successfully IRBM necessary resources have to be provided. First and foremost it is required for capacity building. Secondly, it has to be provided for preparing IRBM master plans for river basins. Last but not least, it is needed to implement the IRBM master plans. Based on similar experience huge investment is expected to be necessary to fully implement IRBM. Foreign funding will definitely help to expedite the implementation of IRBM in this country.

PROPOSED ACTION PLAN

The following programmes are proposed for NABRO's action:

- **Training Programme**

As a start, a standard framework of a comprehensive training modules for all stakeholders at all levels in IRBM is to be prepared. The contents of the training modules are to be provided by the individual countries to suit the local condition and needs. A secretariat is to be set up in each country who is responsible for the implementation of the training programme, including initiation and coordination in the preparation of national contents and its continual updating, as well as conducting the course. NABRO would help to secure fund for foreign experts.

- **Development of River Basin Information System**

An affordable information management system is to be developed, if feasible, using systems developed locally or in the region.

- **Preparing IRBM Master Plans**

To expedite the implementation of IRBM, NABRO may consider partial funding of preparation of IRBM master plans

Table 1: List of Water-related Legislation

No	Legislation
1	Water Act, 1920
2.	Geological Survey Act, 1974
3.	Irrigation Areas Act, 1953
4.	Streets, Drainage and Buildings Act, 1974
5.	The Forest Act, 1984
6.	The National Land Code, 1985
7.	The Incorporation (State Legislature Company) Act, 1962
8.	The Drainage Works Act, 1954
9.	The Fisheries Act, 1985
10.	Environmental Quality Act, 1974
11.	Land Conservation Act, 1960
12.	Town and Country Planning Act, 1976
13.	Local Government Act, 1976
14.	The Merchant Shipping Ordinance, 1952
15.	The Port Authorities Act, 1963
16.	The Emergency (Essential Powers) Ordinance, No. 7, 1969
17.	Selangor Water Supply Enactment, 1997
18.	The Mining Enactment, 1929
19.	Selangor Waters Management Authority Enactment, 1999

Table 2: Functions and Roles of Departments/Agencies

Function	Department/Agency	Role
Water Supply	Department of Irrigation and Drainage	Irrigation water source development Monitoring stream flow and irrigation water supply
	Waterworks Department	Water supply source works Treatment and supply of drinking water
	Tenaga Nasional Berhad	Hydropower source works development Use of water for hydropower
Water Pollution Control	Department of Environment	Control of industrial pollutions
	Local Authorities/Indah Water Consortium	Control and treatment of sewage
	Department of Irrigation and Drainage	Control of pollution from irrigation areas
	Mines Department	Control of pollutants from mining operations
Water Quality Management	Department of Environment	Monitoring of water quality
	Fisheries Department	Prohibition of use of poisoning or destructive methods for fishing
	Chemistry Department	Analytical services on water samples monitored
	Department of Irrigation and Drainage	Planning, construction and maintenance of drainage works
Watershed Management	Forestry Department	Protection of forests. Watershed management within forest reserves
	Town and Country Planning Department	Landuse planning and control
	Tenaga Nasional/Waterworks Department/Department of Irrigation and Drainage	Protection of watershed upstream of reservoirs

