

Implementation of Integrated Water Resources Management in Malaysia: Some Issues and Challenges

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Abstract

Pahang River Basin (PRB) is an important watershed in Malaysia. It does not only meet the water requirement of the people in Pahang State, but also a water supplier to the other state in the Interstate Raw Water Transfer project (Pahang-Selangor ISRWT) as proposed in the Ninth Malaysia Plan (2006-2010). The main objective of this study is to identify the major problem based on the existing water resources management in PRB. In order to achieve success in water resources development, a holistic approach such as the Integrated Water Resources Management (IWRM) is needed in water resources management. Apart from that, the participation of all stakeholders is a prerequisite to attain the goals of IWRM. In view of that, The Malaysia government has played an important role through its policies, plans and programmes. For example, the Integrated River Basin Management (subset of IWRM) in water planning and development was introduced in the latest Ninth Malaysia Plan. However, the current water resources management issues and challenges in Pahang River Basin are a hindrance of getting full participation from the various stakeholders. Although the Federal and State Governments are responsible for the planning and development of the Pahang River Basin, the involvement from the non-governmental organisations (NGOs) and community based organisations are lacking and do not seem to be aware of their important roles in this matter. At last, this study has identified thirteen components with specified issues and challenges of water resources management in PRB.

Introduction

An effective management of water resources requires full participation from the various stakeholders and a holistic approach. Utopian ideals of faultless cooperation and integration are not far-fetched realities (Mokhtar and Aziz, 2003). It does require a change in the existing system and collaborate in unity, regardless of jurisdiction and boundary, identifying the management needs and priorities. Pahang River Basin contains eight districts in the State (A total of eleven districts in Pahang State) and the water resources management involves various agencies from different level. The difficulty would lie in agreeing upon priorities which includes various stakeholders. Therefore, an appropriate institutional framework, a clear policy and strategic and effective implementation of plans are required to alleviate some of the current difficulties.

Study Area

In this study, Pahang River Basin has been chosen as a study area which is located Pahang State, Malaysia (Figure 1). The Pahang River Basin (PRB) is a catchment's area of about 27,000 km², with longitude of 101° 30' E - 103° 30' E, latitude 3° 00' N - 4° 45' N. It consists of five sub-basins and they are Pahang River Basin, Bertam River Basin, Bekapor River Basin, Mentiga River Basin and Bera River Basin. The catchment's area spans seven districts in

Pahang which are Maran, Jerantut, Bentong, Lipis, Temerloh, Bera and Cameron Highlands and one sub district in Kuantan, eleven sub districts in Pekan and also two districts in Negeri Sembilan State which are Jelebu and Kuala Pilah (SMHB,1992; Pahang,1973).The climate of PRB is generally hot and wet with an average annual rainfall between of 2,000 - 3,000 mm. Central Mountain Range bounds PRB along its western side and East Coast Range in the North-East. The main river in Pahang River Basin is Pahang River, which flows for a length of 440 km and is the longest river in Peninsular Malaysia.

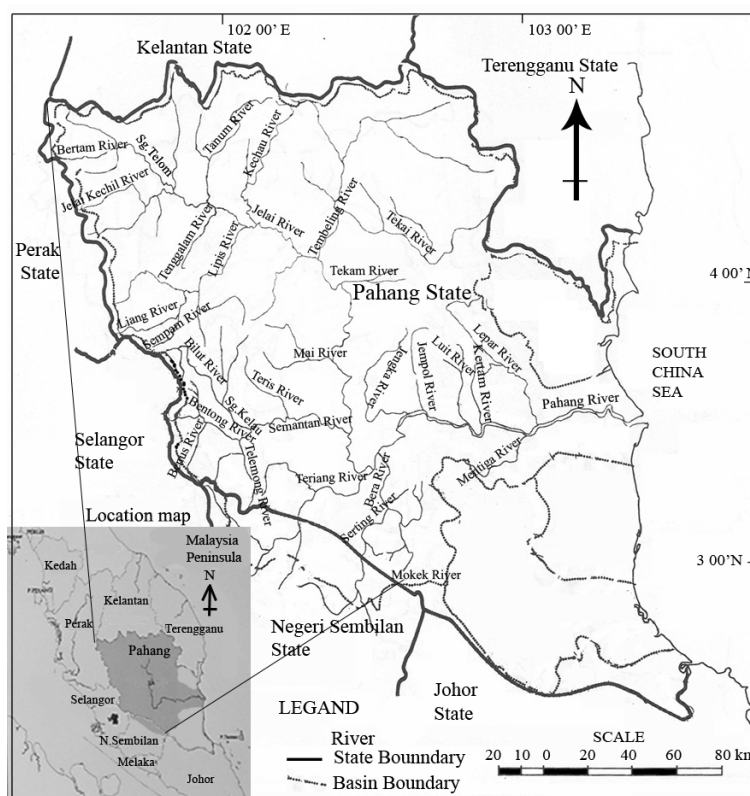


Figure 1. Location of Pahang River Basin, Malaysia

Problem Statements

Some social and environmental problems exist in the basin such as population growth, high siltation in river and lakes and non-point sources pollution. However, the major concern is what the future of water resources status is after operating of Pahang-Selangor instate raw water transfer infrastructure in the Pahang River Basin. Hence, water resources management in the Pahang River Basin requires a strategic and holistic approach through full participation of all levels of stakeholders to articulate the key issues.

Issues and Challenges

Low participation from NGOs and local communities was the main problem identified which hinders the progress of implementing the Integrated Water Resources Management (IWRM). As a result, it has led to some negative impacts in the area such as the unsustainable utilisation, the management of water resources, and the decreased level of water quality (United Nations, 2004; Tan, 2007). The main causes which contributed to the problem were identified and these include the following:

- Lack of legal requirement
- Low level of awareness among decision maker
- Political interference

Besides that, this study conducted the situation analysis on the thirteen IWRM components which extracted from Global Water Partnership's IWRM toolbox. Each issues and challenges were identified for each component as shown in Table 1.

Lessons learned

Some lessons could be learnt from this study which related to water resources management in Pahang River Basin as:

- Specific funding is required to improve the capacity of enforcement agencies and Federal Government has played the important role on this issue.
- Full participation from all level of stakeholder in Pahang River Basin management and this can be assurance through the formulation of new water resources management enactment.
- Local communities have partnership with government agencies to implement the IWRM plan and are committed to accomplish the aim of plan.

Conclusions

Integrated approach in water resources management of river basin requires a full commitment from all levels stakeholders. Besides that, the understanding of characteristics of the river basin such as the physical, economic, social, as well as the institutional framework should not be neglected. Apart from that, this paper has also revealed the major issues and challenges for those IWRM components within the context of Pahang River Basin. At last, the finding of the study may prompt the following question to be investigated for further exploration:

- To what extent does the political will of Pahang State Government allow full participation from relevant NGOs, civil society and local communities towards the water resources planning and management?

Table 1. Some issues and challenges on Pahang River Basin towards Integrated Resources Management approach

IWRM Components	Issues and challenges in Pahang River Basin
<p>1. Related Policies to the Water Resources Management</p> <ul style="list-style-type: none"> An appropriate framework must mesh with national development objectives and also mainstream water resources concerns in term of use, protection and conservation. 	<p>There is lack of a comprehensive policy on water resources development and planning in Pahang River Basin. Policies and plans such as the National Physical Plan 2005, Ninth Malaysia Plan (2006-2010), National Policy on the Environment 2002, National Policy for Biodiversity 2998, and National Policy for Forestry 1987 are currently available to address the complex issues that are related to water resources. They include assessing the relative environmental, economic and social values of water; assessment of social impact; restoring and protecting the quality of fresh water.</p>
<p>2. Legislative Framework</p> <ul style="list-style-type: none"> A framework is used to support IWRM and provides a structure for both development objectives and mainstreaming of water resources concerns. 	<p>In Malaysia, Federal Constitution 1957 is ranked supreme all over the nation. The relationship between Federation and State governments are stipulated in the Federal Constitution. The water resources related laws and the enforcement agencies are not exceptional and they function within the constitutional framework. Generally, 'water' is a state matter, which is enumerated in the State List (Sani 1997). The water activities such as watershed management, water resources development and management, navigation, fisheries and mining are enumerated in the State List. Although existing comprehensive legislation framework in Malaysia such as the Waters Authority Management Enactment in Selangor State, there still lack of provision that recognise the role of local communities into water resources planning and management in Pahang State.</p>
<p>3. Financial Structure of Water Resources Management</p> <ul style="list-style-type: none"> Water funding strategy that estimates overall investment requirement, and identify funding sources. 	<p>Under the Federal Constitution Article 96 to Article 107, all revenues and money received by the federation and state government shall be paid through the Federal Consolidated Fund and Sate Consolidated Fund for any development projects. The development budget is arranged through the Malaysia Five-Year Plans (e.g Ninth Malaysia Plan (2006-2010)), which are coordinated every five years by the Ministry of Finance through National Finance Council (Pahang, 1973). The existing financial structure supports the water resources development but lack of financial support from government to increase the capacity of enforcement bodies. Due to this hindrance, some environmental issues such as illegal logging and non-point sources water pollution always happen in Pahang River Basin.</p>
<p>4. Institutional Framework</p> <ul style="list-style-type: none"> Fundamental mechanisms for coordination to ensure some measures of integrations. 	<p>Federal and several State Government agencies are carrying out water resources management tasks in Pahang River Basin. Their roles are clearly defined in term of operation and maintenance, water supply infrastructure development, research and development of water resources. Besides, National Water Resources council is the platform to discuss the water resources management issues between Federal and State Government that ensure coordination of various stakeholders in the management of river basin will being well functioning. In the water services sector, NWSC is formulated under provision of Water Services Commission Act. The function of NWSC is to employ the Water Services Industry Act, 2005 that supervises, licensing and monitoring the water services industry within Peninsular Malaysia and Federal Territory of Labuan. However the NGOs, local communities and civil society are encouraged to participate in the early stage of water resources planning, but the role of group still is not recognised in management of water resources.</p>

<p>5. Institutional Capacity</p> <ul style="list-style-type: none"> • Capacities of people and institutional at all levels that effectively work towards the goals and objectives. 	<p>Capacities building activities which are related to IWRM were held by the government in cooperation with various institutions e.g. Malaysian Water Partnership (MyWP), MyCapnet, Global Environment Centre (GEC) and Open University of Malaysia. These agencies are playing the important role for capacity building in Malaysia through conferences and workshops. Likewise, the Open University of Malaysia has offered an MSc course in IWRM to the public. Although formal and non-formal education are prepared in Malaysia, low level of capacity in enforcement agencies (e.g. Department of Environment, Forestry Department and Local Government) that are rising out some environmental problems such as river pollution and loss of natural resources.</p>
<p>6. Water Resources Assessment</p> <ul style="list-style-type: none"> • Assessment looks at both quantity and quality of water resources and pinpoints the major water resources issues and potential conflicts in different sector. 	<p>Since 1973, three water resources studies for Pahang River Basin have been conducted by Malaysia Government. The latest national study on water resources for the Pahang State (1992) has given a comprehensive planning and management scenario from 2001 until 2050. Nevertheless, Initial National Communication and National Communication 2 (2007-2009) are launched that become a platform to further integrate climate change issues and impacts into the national and local strategic and development plans. The main hindrance is to translate the proposed strategies into action plan.</p>
<p>7. Implementation Plan of IWRM</p> <ul style="list-style-type: none"> • Work plan that includes development of effective framework for policies, legislation, financing structures, capacities of institutions with defined roles and management tools. 	<p>In national level, IRBM (Subset of IWRM) approach has been promoted in Ninth Malaysia Plan (2006-2010) and National Physical Plan (2005) to ensure the sustainability of water resources. The Kedah State has been chosen as pilot case for implementation IWRM in Malaysia. The latest National Framework on IWRM was approved by National Water Resources Council to applied IWRM approach to manage the water resources in holistic manner. In State level, although there are no any plans or strategies that are formulated to implement IWRM, study on Effective Implementation of IWRM was conducted by Department of Irrigation and Drainages to identify the package and information modules for the stakeholders and also formulate the action plan for IWRM capacity building.</p>
<p>8. Water Resources Demand Management</p> <ul style="list-style-type: none"> • Demand management aims to change user practice and behavior that improves the efficiency in water use, reuse and conservation. Hence this linked to social changes, regulatory and economic instrument. 	<p>Pahang State is one of the state has reached a high percentage of non-revenue water in Malaysia which is 38% in 2000, 43% in 2001, 48% in 2002 and 47% in 2005 (MWA, 2003; EPU, 2006). These data are a significant and become an indicator to show the insufficiency water demand management in Pahang. However, some strategies are promoted in Ninth Malaysia Plan (e.g Geographical Information System mapping of distribution network, rehabilitation of distribution systems, upgrading of existing water treatment plants and tax rebates for industries that recycle water) but it should be integrated into social and economic instruments that changes the behavior of water users</p>
<p>9. Social Change Instruments</p> <ul style="list-style-type: none"> • Changing attitudes in individual, and institutions to ensure water practices to achieve IWRM. Some instruments may be used such as education curricula, on job training and awareness raising programme. 	<p>Awareness programmes and campaigns have been launched since 2000 by government agencies and NGOs such as MyWater Voice forum, Malaysian Environmental Week, Sustainable City and Sustainable School Contest. The concept of these events is to deliver the concept of sustainable development and importance of water resources to the potential stakeholders.</p>

<p>10. Conflict Management</p> <ul style="list-style-type: none"> • It is used to anticipate, prevent and react to conflicts between individual and institutional in term responsibilities overlap, competition for scarce resources and incompatible approach. 	<p>This requires suitable mechanisms or institutional platforms to overcome water resources competition issues or conflicts. In Malaysia, five types of coordination system are found which are (i) committee system, (ii) council system, (iii) bilateral consultation, (iv) specific unit and (v) statutory system. The National Water Resources Council and National Water Services Commission are the major bodies that are formulated to discuss and approve water related plan and issues between key stakeholders. The roles of NGOs and local communities are permanently involved in these councils.</p>
<p>11. Regulatory Instruments</p> <ul style="list-style-type: none"> • It is used to control the water quality, quantity and water services. Examples: Laws, rules and standards. 	<p>The Drainage Sewerage Services Act 1993; Street, Drainage and Building Act 1974; Environmental Quality Act 1974, Water Services Industry Act (Act655) and Local Government Act 1976 are the main legislations for the water quality. These legislations were formulated to prevent, control of pollution of the atmosphere, soil, inland waters and sea; and enhance the environment and improving sanitation of public. In addition, the Sewage and Industrial effluents Standard; Malaysia Water Quality Standard; EIA guidelines 1987, Malaysia Sewerage Industry Guideline (under review), and Storm-water management manual were promoted in order to assess the private sector and public in related water quality matters (DOE, 2000). Some provisions of regulations are overlapped such as EQA1974 and Local Government 1976; both Acts provide enforcement power to different regulatory bodies for controlling of water resources pollution in the River Basin.</p>
<p>12. Economic Instruments</p> <ul style="list-style-type: none"> • It involves the pricing market based measures which provides incentives to water users to use water efficiently. 	<p>Water pricing system for Pahang state was set according to three basic approaches, (i) Higher rates for higher of volume water consumption to discourage wastage; (ii) Cross-subsidy for domestic water users by industrial water users; and (iii) minimum lifeline rate, which meet the ability to pay by lower income users for covering basic need of water for domestic purposes (MWA 2003). In the State of Pahang, the average domestic water tariff is RM0.57 m⁻³ (for the first 35 m³), and average for industrial water tariff is RM 1.45 m⁻³ (for the first 500 m³) and the State Government does not revise these water rates since 1983. Meanwhile, Pahang State has been recognised that having heavy debt to Federal Government in the matter of water industry which is RM 10,534,306 (Lim 2006). Pahang River Basin is a catchments' which is rich of water resources (80 thousands million m³ annual rainfall) in Peninsular Malaysia but the water debt may reveal the ineffectiveness of economic instruments in Pahang State.</p>
<p>13. Information Exchange and Management</p> <ul style="list-style-type: none"> • An effective information management can allow professional and public to exchange and share experience in implementing IWRM, ensure engagement local communities in water management. 	<p>The Department of Irrigation and Drainage are developing the National River Basin Decision Support System (NRBDSS) and part of the system is to support the Malaysia Geospatial Data Infrastructures (MyGDI). NRBDSS is developed to integrate all river basin information in Malaysia into an effective decision support system and this system will be updated by relevant government agencies (Lee, 2004). The availability of information on hydrological, biophysical, economic, and environmental characteristics are able to make better policy decisions and predict important responses in the basin. In order to achieve an effective participatory process, the availability of relevant information such as up-to-date records and data for all water aspects is an essential precondition. The system only can be accessed among key government agencies. Although, academia, NGOs and local communities can obtain the data by following the application procedures, some sensitive information and data are restricted to be accessed.</p>

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