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An Appropriate Institutional Framework Towards Integrated Water Resources Management in Pahang River Basin, Malaysia

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Abstract

Over the past five decades, rapid development and conversion of forest land into urban land in Pahang River Basin have led to water related problems such as solid wastes problem and degradation of water quality and quantity. This paper discussed the current institutional framework for planning and development in Pahang River Basin, Malaysia. This case study applied the literature background study and field survey. There is lack of provision to give a clear mandate for public participation in the local planning level and public representative could not be guaranteed in the local planning committee. Based on this Pahang River Basin case study, this paper further argues that the participation of local community needs to be strengthened from consultation level to the involvement level. This could be approached through joint management concept. Integrated approach on water resources management of river basin requires a full commitment from all levels of stakeholders. However, the understanding of the characteristics of the river basin both from the natural and human system aspects could not be neglected in planning and development process.

Keywords: Integrated water resources management, institutional framework, public participation

1. Introduction

The management of water resources poses numerous challenges to decision makers in developing countries and it requires a holistic approach to manage the water resources. However, the public sector in decision making in water resources management system is very often in dispute. An effective management of water resources requires full participation from the various stakeholders. It does require a reform in the existing system and collaborate in unity, regardless of jurisdiction and

boundary, identifying the management needs and priorities. For Pahang River Basin, Malaysia, it consists of 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.

Water shortage in Selangor State and Federal Territory of Kuala Lumpur is not the latest issue in Malaysia. In 1998, a serous water crisis occurred in Klang Valley, Malaysia when the three reservoirs namely Klang Gates Dam, Batu Dam and Semenyih Dam suffered a substantial drop in water level. The subsequent water shortage affected almost all the residents of Klang Valley. This water crisis in 1998 has become an indicator to show insufficient water resource in these areas during the serious dry season. Due to this problem, the Government of Malaysia has taken initiative to develop the Pahang-Selangor Interstate Raw Water Transfer system (Pahang-Selangor ISRWT), which will commence construction during the Plan period (2006-2010) (EPU, 2006). The purpose of the project is to address water shortage and uneven distribution of water resources in Selangor, Kuala Lumpur and Putrajaya by transferring raw water from Pahang River Basin (Kelau and Telemong River) through a 45 km long tunnel into upstream of Langat River Basin. According to Government of Malaysia (1992), water consumptions from domestic, industrial and agriculture sector is 53 million litres per day in the year of 2000. By the year of 2050, the total water demand is expected to reach 4160 million litres per day. Although the total water capacity of Pahang River Basin is 8500 million litres per day, upon operation of the system, the total amount of raw water to be transferred from these rivers is 4000 million litres per day (Government of Malaysia, 1992). In order to satisfy water demand on these two river basins, the Pahang State Authority must take appropriate measures to protect the potential water catchments. Deterioration of water quality in Pahang river basin will not only affect the water supply in Pahang State but also the other areas such as Selangor State and Federal Territory of Kuala Lumpur.

2. Integrated Water Resources Management (IWRM)

IWRM was introduced for hydrographical management through public participation in Spain in the early twentieth century and in France and Italy in the second half of the twentieth century under the name of “Integrated water and land resources development and management” (Dukhovny et al, 2004). Global community responded to such issues during the late twentieth century. Before that, due to increasing demand for this resource, a United Nations conference was held in Mar del Plata, Argentina in 1977 to discuss the increased supply and sanitation (Biswas, 2004). After more than a missing era to review this matter, the international conference on water and the environment was held in Dublin in 1992 when the concept of IWRM was formally conceived by global community for sustainable development through declaring its four principles (Biswas, 2004).

Global Water Partnership (GWP) defined IWRM as a process which promotes coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (MWP, 2000; GWP, 2004). The fundamental aspect of IWRM is the integration of human and environmental system in the development initiatives. Similarly, Dukhovny et al (2004) defined IWRM as “… a system based on account of all types of water (surface, ground, return) within hydrographical boundaries, which connects interests of various sectors and hierarchic levels, promotes effective water use in interest of sustainable development of society and ecologic security”. IWRM addresses issues of economic efficiency, social equity and environmental sustainability. While implementing IWRM, integration should take place both horizontally – i.e. across sectors, and

vertically – i.e. across different tiers of authorities and spatial scales (GWP, 2006; Dukhovny et al, 2004).

In the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa in 2002, emphasized that water should be managed in a basin-wide context and should be under the principles of good governance and public participation (Rahaman & Varis, 2005). Policy decisions making will affect the water management and it could be taken at national and river basin level. River basin constitutes unique management unit for IWRM implementation and it is delineated by natural boundary. Therefore, Integrated River Basin Management (IRBM) has been recognised as the subset of IWRM.

World Summit on Sustainable Development (WSSD) also called for countries to develop Integrated Water Resources Management and Water Efficiency Plans by 2005 to support countries for their sustainable development. Except for some developed countries and a few developing countries, achievement in the adoption and preparation of IWRM and Water Efficiency Plan is far behind the stipulated target. According to the report of Global Water Partnership, Malaysia is in the process of preparing national strategies or plans but still require further work to live up to the requirements of an IWRM approach (GWP 2006). The United Nations Environmental Program (UNEP) has produced Malaysian National Report in 2006 in which lessons learned in implementing IWRM in Malaysia was documented in accordance with three pillars of enabling environment, institutional role and management instruments and is the main basis for this case study. Based on key change areas, a further assessment is carried out to link it to the National Vision 2020 target to attain the status of developed nation by 2020. Developed nation status cannot be achieved without sustainable development which is heavily anchored on successful IWRM implementation at least right from the river basin level.

In term of IRBM implementation, Mekong River Basin Commission is a successful showcase in Asian region to demonstrate the integrated approach on water governance. In 1995, the four Lower Mekong Basin governments established the Mekong River Commission (MRC), with a much broader mandate on equitably sharing resources and sustaining both the environment and human welfare.

Environmental conservation and its integration with sustainable development is a major challenge for many developing countries where Malaysia is not an exception. Malaysia has gone through an economic transition from agriculture and primary production, towards urban and industrial economic base. The increasing urban migration has resulted in more than a half of Malaysia's population being concentrated in the urban areas. This socio-economic change has brought forward pressure on water and land resources. It is critical to analysis the current water institution framework and management mechanisms within context of IWRM.

3. Background of Study Area

In this study, Pahang River Basin has been chosen as a study area which is located in Pahang State, Malaysia (Figure 1). The Pahang River Basin is made up of a catchment area of about 27,000 km^2, with longitude of 101º 30' E - 103º 30' E, latitude 3º 00' N - 4º 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 span over seven districts in Pahang, consisting of 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; consisting of Jelebu and Kuala Pilah (Government of Malaysia,1992; 1973). The climate of PRB is generally hot and wet with an average annual rainfall between 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.

In line with national objectives, Pahang State Government has identified the key to its growth lies in strengthening and broadening the State's economic base by giving due emphasis to the three (3) core sectors e.g manufacturing, tourism and agriculture (DoA, 2005; Government of Malaysia, 1992). In Pahang River Basin, the total area under cultivation is 754 thousand ha. The major crops are oil

palm and rubber which covered 449 thousand ha and 245 thousand ha respectively (Government of Malaysia, 1992). According to Department of Environment's annual report (DOE, 2005; 2004), the major pollution source of the river water quality in Pahang River Basin is the waste water discharging from the rubber and oil palm estates.

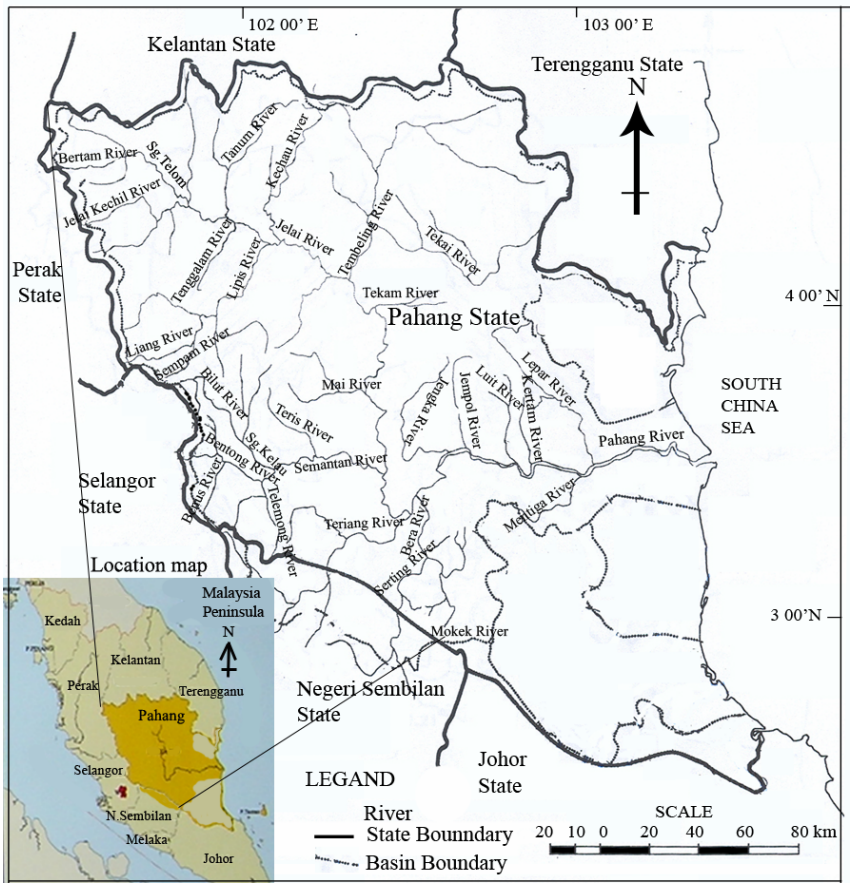
According to the Statistics Department Malaysia (2004), Pahang River Basin has a population of 935,750 in the year 2000. For the past two decades, Pahang State has been experiencing heavy in-migration due to the pull factors of economic development and particularly the launching of new land schemes by the Federal Land Development Authority Malaysia (FELDA). These have attracted settler from the other states to Pahang State. The projected population for major district in the Pahang River Basin shows rapid population growth in every 10 years interval from 1970-2020 (Table 1).

Table 1: Population and Growth Rate in Pahang River Basin

	1970	**1980**	**1990**	**2000**	***2010**	***2020**
Total Population	442,101	659,577	851,467	935,750	1,032,485	1,464,682
Growth Rate	NA	4.00	2.55	0.94	0.98	3.50

* Population forecasting
(**Sources:** Statistic Department Malaysia, 2004; Government of Malaysia, 1992)

Figure 1: Location of Pahang River Basin, Malaysia (Source: Government of Malaysia, 1992)



4. Data Sources and Analysis

This study was conducted by using two methods, which were background literature study and field survey (interview session)

Background Literature

Documents reviewed comprise of national development plans and policies (e.g. Ninth Malaysia Plan 2006-2010, National Physical Plan 2006-2010, National Environmental Policy 2002, National Biodiversity Policy 1998, National Forestry Policy and National Agricultural Policy); local development plans (e.g. Pahang State Structure Plan, 2007 and Cameron Highlands District Plan, 2002) and water related provincial laws. These documents were reviewed by using the evaluative criteria of IWRM approach. These evaluative criteria were (i)Sustainable Development in watershed , (ii) Sustainable utilization of natural resources, (iii) Implementation of Integrated Water Resources Management/Integrated River Basin Management, (iv) Sustainable land use and minimal land degradation, (v) Improvement on the adequacy and affordability of water services (vi) Safeguard the water resources (surface, ground and marine water) (vii) Rural development (including indigenous People welfare) (viii) Promoting planning tools (e.g. environmental impact assessment, strategic environmental assessment, social impact assessment and cost benefit assessment), (ix) Institution and individual Capacity Building, (x) Inventory assessment (e.g. land, biodiversity assets surface and ground water), (xi) Review, update and dissemination, (xii) Political will in sustainable development NGOs, (xiii) Public and private sectors in water management (xiv) International network for IWRM; (xv) Regulation Enforcement (Water related legislations, standards and guidelines) (xvi) Monitoring Performance/ Impact Indicators

Field survey

In order to gather more constructive inputs for this study, the formal interview sessions were conducted with 20 officers from water related technical government agencies, and 150 local individuals. The respondents mainly were direct beneficiaries and opponents such as government agencies' officers, local farmers, hotel operators, palm oil estate operators, water service providers, and housewives. The interviews were planned around the local water resources management issues and evaluative criteria questions for selected IWRM components.

5. Malaysia's Initiatives on IWRM Implementation

Policies: In Malaysia, water resources planning and management are still governed by sectoral policies, strategies and plans. The Ninth Malaysian Plan (2005-2010) has urged for the formation of a national water policy in accordance with IWRM principles and endorsed all specific objectives of the Malaysian Water Vision 2025 (UNEP, 2006). The National Water Resources Council (NWRC), established in 1998, is now addressing the cross cutting issues and provide policy decisions related to water resources management. NWRC is chaired by the Prime Minister and with members comprising of Ministers from related Federal ministries and the Chief Ministers from all the states. There is lack of a comprehensive policy on water resources development and planning in Pahang River Basin. Sectoral policies such as the National Policy on Urbanisation 2005, National Policy on the Environment 2002, National Policy for Biodiversity 1998, 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.

Although Malaysia's Water Vision 2025 was not endorsed as policy instrument by the government until the Ninth Malaysian Plan (2006-2010), it was well accepted at Federal level. Key objectives of this vision are: (a) water for people, (b) water for food and rural development, (c) water for economic development and (d) water for environment. In order to achieve these objectives,

following four challenges have been identified: (a)Management of water resources efficiently and effectively from the point of quality and quantity; (b) Moving towards integrated river basin management; (c) Translating awareness into political will and capacity and (d) Moving towards adequate, safe and affordable water services.

Legislative framework: In Malaysia, Federal Constitution of Malaysia 1957 is the supreme law of the nation. The relationship between the Federal and State governments is stipulated in the Federal Constitution. The Federal Constitution 1957, demarcated executive, administrative and legislative boundaries, divided between the prevalent three-tier government systems, which is Federal, State, and Local Government (municipal and district authorities). The jurisdiction and legislative power in the aspect of water distributed between Federal and State Governments in accordance within the Legislative Lists of Federal Constitution which are Federal List, State List and Concurrent List. The water resources related laws and the enforcement agencies are not exceptional and they function within the constitutional framework. Generally, 'water' falls within the State jurisdiction, 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. The legislative framework for specific protection and conservation of water and land resources has been developed since the beginning of economic growth period in Malaysia by enacting the Waters Act 1920 (amendment in 1989) and the Land Conservation Act 1960. The concept of conservation has been further integrated in the legislative framework by enacting the Environmental Quality Act (EQA) 1974, but sectoral delegations of authority over these acts have fragmented the achievements in the protection and conservation of water and land resources from IWRM principles.

Some 40 Federal laws and 3 to 4 enactments are dealing with the matters related to water and land resources in the Pahang River Basin. A list of the laws is shown in Table 2. These laws generally govern the user and the protection of water resources. Land related matters like country planning, public health, sanitation, drainage, irrigation, and rehabilitation of ex-mining lands are under the concurrent list of the Federal and State Government. The Town and Country Planning Act 1976 (Act 172), having subsequent amendments in 1995 and in 2001, has been the core land management related legislation in Malaysia and enforced to ensures the proper use, conservation and development of lands for sustainability. The water and land related laws may be grouped according to the provisions of water utilization, water conservation, water quality, public health and land development, and enforced mainly by the Department of Environment, Department of Irrigation and Drainage (DID), Land Office, Mines and Land Department, Fisheries Department, Forestry Department, Sewerage Services Department, Local Authority, Town and Country Planning Department and Water Supply Department (MWA 2005).

These Federal and State Government agencies are separately responsible to control and regulate water and land related issues in Malaysia. In the case of water resources, the Federal Government is responsible for federal works and power including water supply, interstate rivers and canals while the State Government is responsible for control over state rivers, riverine fisheries and water supplies and control in the case of any water related matter under agreement among the states and control of silt and riparian rights. Drainage and irrigation issues are within the concurrent list. In order to improve the water supply and sewerage services and for better control, the Federal Government had to amend the Water Services Industry Act 2007, which shifted water supply and sewerage services from the State list to the Federal list. Although there is an existing comprehensive legislation framework in Malaysia, it is still lack of provision such as Water Resources Management Enactment in the State level to recognise the roles of local communities into water resources planning and management in Pahang State.

Table 2: Statutes established to address water resources management and other resources issues

Management Issue	Statutes	Agencies
Water and River protection	Water Act, 1920; F.M.S. Silt (Control) Enactment 1922; Drainage Works Act 1954; Street, Drainage and Building Act 1974; Environmental Quality Act 1974, Local Government Act 1976; National Parks Enactment, 1939; National Forestry Act, 1984; Forestry Enactment, 1985; Mining Enactment, 1926.	Water Supply Department, Department of Environment, Department of Irrigation and Drainage, Local Authority, Town and Country Planning Department, Forestry Department
Land and Soil	Mining Enactment 1929; Land Conservation Act 1960; National Land Code 1965; Street, Drainage and Building Act 1974; Town and Country Planning Act 1976	Local Authority, Land Office, Mines and Land Department,
Water Services	Water Act, 1920; National Water Services Industry Commission Act, 2007; Water Services Industry Act, 2007	Sewerage Services Department, Water Supply Department

(**Source:** MWA, 2005; GWP, 2006; Tan & Mokhtar, 2007)

6. Current and Proposed Institutional Framework

The term of participation is most used to refer to some aspects of local populations in the design, implementation and evaluation of the project and plan (Brown & Wyckoff-Baird, 1992). Public participation always is recognised as a practice of stakeholder engagement. A common public participation approach is to hold public hearing session and meeting in which everyone is allowed to provide constructive inputs. According to International Association for Public Participation (IAP2), public participation includes five aspects which are Information, Consultation, Involvement, Collaboration and Empowerment (IPA2, 2007). These aspects have specific goal on public participation.

Malaysia has experienced with inter-agency collaboration through creation of councils and committees. It is divided into three levels; Federal level, State level and Local level. Some committees and councils have been established to plan and implement development projects. The National Development Planning Committee, National Physical Planning Council and National Action Council were formulated as planning and monitoring body for any water related projects in Federal level. The members of these bodies are mainly from the governmental agencies. The National Development Planning Committee and National Physical Planning Council play the role to formulate the Perspective Outline Plan, National Development Plan and National Physical Plan. These plans become the physical development policy for local development plans in Malaysia such as Pahang State Structure Plan 2002-2020 and Spatial Plan for Local Authority. Based on the national planning mechanism (EPU, 2004), the private sectors, NGOs and CBOs are encouraged to participate in consultation of Inter-agency Planning Group (IAPG) for water sector development project to National Development Planning Committee. This provides a collaborative decision making in preliminary water resource planning in national development plan. A National planning framework has been shown in Figure 2. This planning process for water resources in Pahang River Basin can be concluded as a coherent mechanism.

In the State level, the State Government is identified as the core stakeholder of water resources management in the area. Aligned with the national development mechanism, the Pahang State Development Committee (review issues and problems of development in state level including all water related projects) and Pahang State Action Council (monitor the progress of development project in state level) have been established in the State. These committees (e.g. State development committee and Action Council) are important to translate the federal policy into state and local plan. These bodies are chaired by the Chief Minister of Pahang State and the members consist solely of government agencies (Figure 3). According to the Town and Country Planning Act (TCPA) 1976, there are no provisions to guarantee public representatives in the State Development Committee but Partnership with the public in water resources planning has only been strengthened through public hearing session. Public can state out their comments and recommendations to the State Development Committee. This could help to identify the development solution and takes into consideration of public need. However,

problem may arise with the absence of local representatives in State Development Committee. Due to absence of local representatives, the State planning committee may function without taking consideration of local issues and requirements in drafting stage of development plan. Besides, it is often argued that public participation process in the planning process in more process to fulfil the legal requirement by authorities rather than a strategic planning process that take into consideration of public requirements (Kumaran, 2006). The concept of participation could not be limited to one public hearing session after prepared draft plan.

In term of water resources management, the National Water Resources Council plays a coordinating role regarding the water related issues and activities between the Federal and State Government agencies. In term of water services, the formation of National Water Services Commission in year 2007 is essential to monitor the licensees' ability to perform and meet such operational obligations in water services sector. Although these two major apex bodies have been formulated in Federal level for the purpose of safeguarding the water resources, there is still an absence of a body to regulate and monitor the sustainability of water resources in Pahang River Basin. Even though the participation of NGOs and CBOs in the planning of water resources is encouraged, the implementation of development plans and projects are still handled by the related ministries and agencies. There is lack of legal provision that allow for active and effective participation of local communities and NGOs in the management of water resources.

The existing institutional linkages need to be reviewed as to conform to the needs of integrated water resources management. Institutional change is not a simple one-way process and several factors may accelerate the process of the change such as political will and deliberate community capacity building is to foster the change (Sokile et al., 2003). Furthermore, water resources management should be approached in an integrated manner which includes resources protection and conservation, use and allocation, assessment and monitoring, planning and development. These functions require full commitment from all level of stakeholders and needs an enabling environment to encourage various stakeholders especially NGOs and CBOs who are playing their important role in the sustaining sound water management. In order to promote the integration of water resources management, the reformation of the existing water institutional framework could be carried out to permanently include the NGOs, CBOs and local communities in the implementation of water resources plan.

Some appropriate policies such as National Policy on the Environment and National Policy for Biodiversity are currently available in Federal level to address complex issues that are related to water resources, including assessing the relative environmental, economic and social values of water; assessment of social impact; restoring and protecting the quality of fresh water. Besides, national development plans such as Third Outline Perspective Plan (2001-2010) and Ninth Malaysia Plan (2006-2010) have been integrated the priority of water resources in order to overcome the water sector issues. Although sectoral policies and cross sectoral national development plans have been formulated, water related problems are still occurring in the Pahang State. This may indicate to the failure of translation of national development policy into the local level.

Due to the complexity of integrated water resources management concept, it required a comprehensive long term river basin plan. The absence of integrated water resources management plan and coordination body were identify as the factors in this case study that caused the water related problems. In order to overcome shortfalls of the current management system, formulation of the Pahang Water Resources Council can overcome the fragmented coordination mechanism, hence gathering all the key stakeholders under one roof to deal with the water resources issues. The Pahang Water Resources Council also becomes a planning body to formulate the long and short term river basin management plan. The main responsibility of this council is not only to formulate policy, provide guidance, approve and implement water resources and inter-river basin development plans in the Pahang State but also as the coordination body in the local level. All of the key stakeholders from the Federal and State Government agencies, representatives from municipal and district councils, NGOs, CBOs, academia and private sectors are the members of this council. However, Pahang Water

Resources Management Enactment was suggested to be formulated by the State Government to give a clear mandate for the formulation of Pahang Water Resources Council. It would be functioning to develop and manage the water resources without compromise local issues and community needs in adopting IWRM.

Engagement of stakeholders from the district level will be facilitated through the creation of River Basin Management Committees. Different catchment areas may have different hydrological characteristics and functions. Pahang State comprises of three major river basins namely the Pahang River Basin, Rompin River Basin and Kuantan River Basin; therefore in order to ensure the good practice management, it is expected that Pahang State will have three river basin committees (e.g. Pahang River Basin Committee, Rompin River Basin Committee and Kuantan River Basin Committee). The purpose of establishing these committees is to divide Pahang State into river basin districts according to their catchment boundaries for proper management. The main function of the committee is to plan, implement and monitor the activities under the relevant river basin plan as formulated by the State Water Resources Council. Figure 4 depicted a proposed institutional framework in water resources planning and management.

Figure 2: National Planning Frameworks in Malaysia

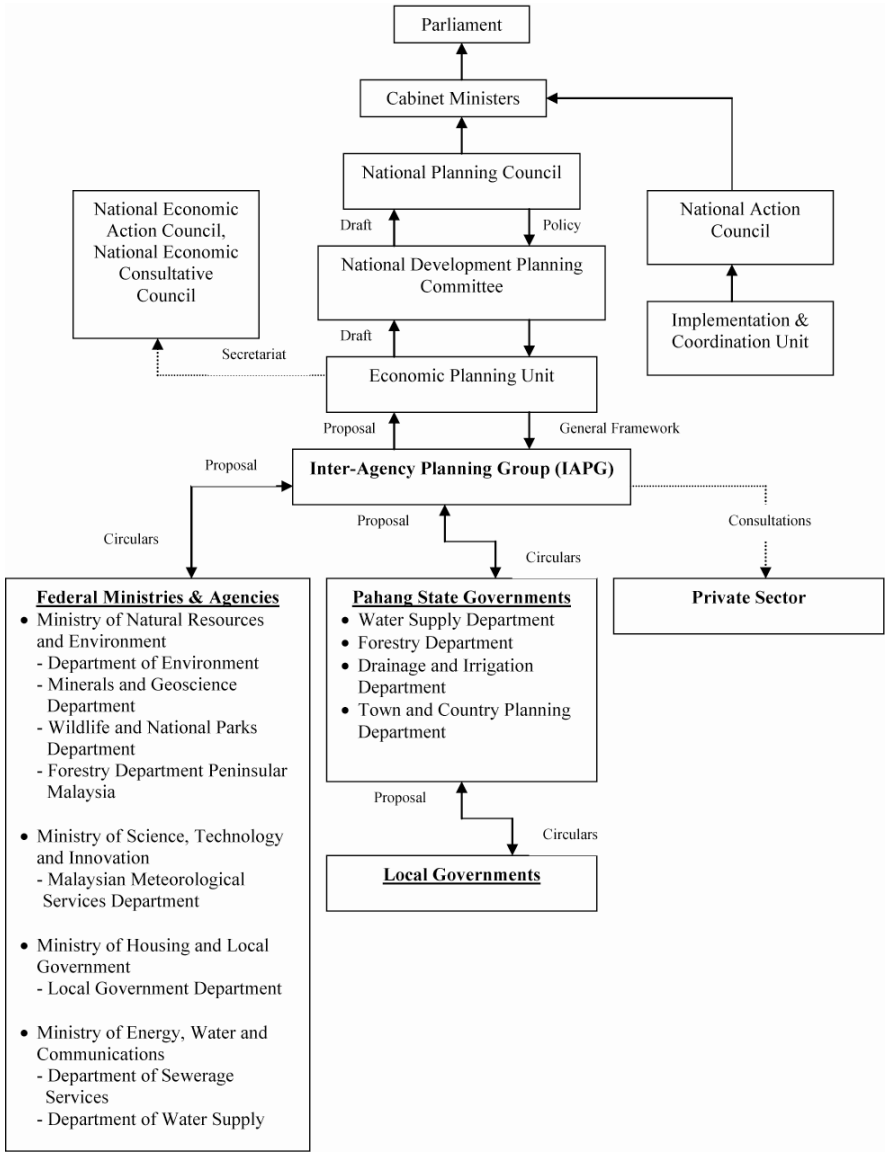


Figure 3: Current Development Framework in Pahang State

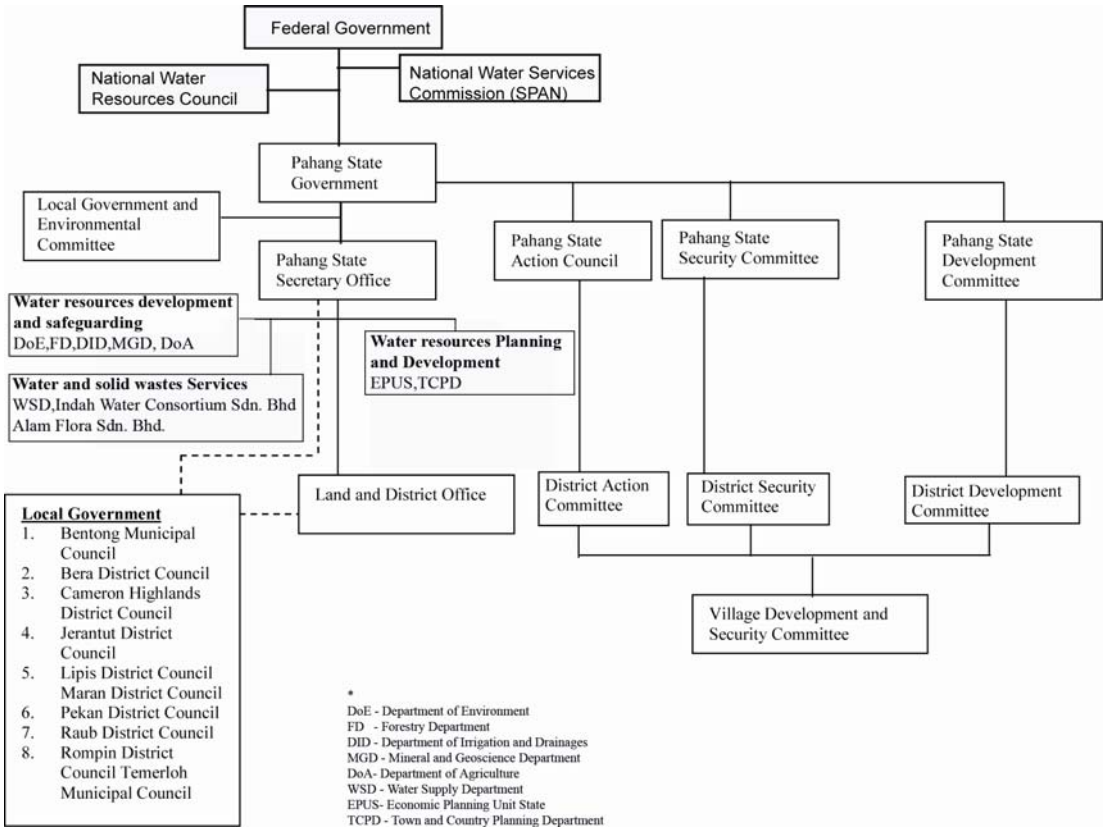
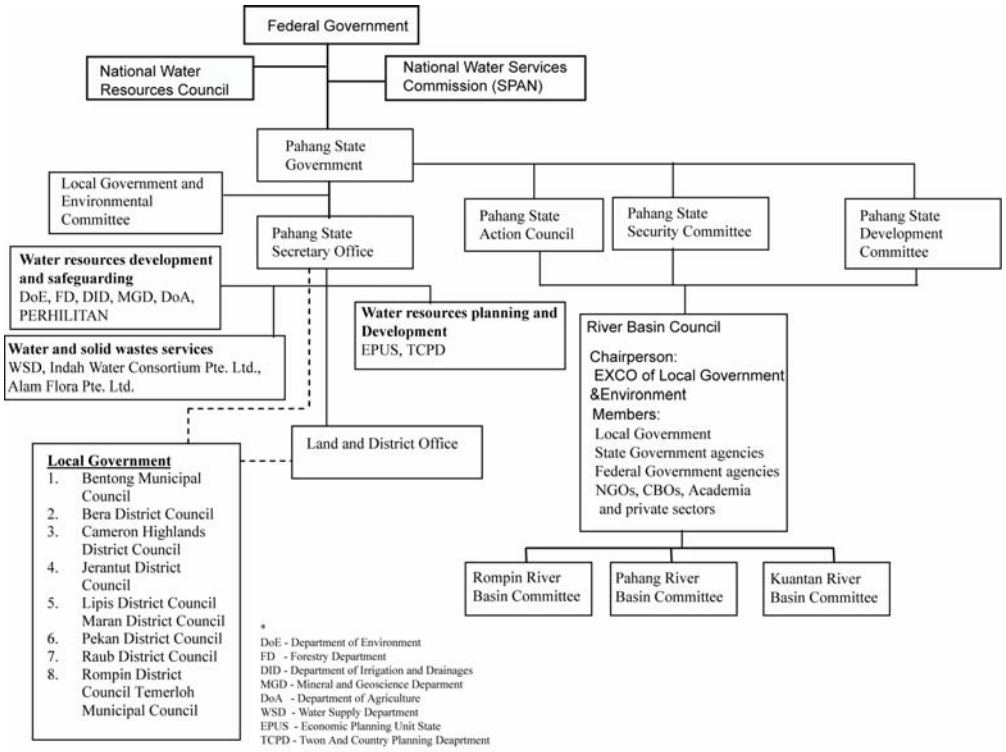


Figure 4: Proposed Institutional Framework for Pahang State



7. Conclusions

Integrated approach in water resources management of river basin requires a full commitment from all levels of stakeholders. Besides that, the understanding of the 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 revealed the current water institutional framework and public participation issue in 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 the Pahang State Government allow full participation from relevant NGOs, civil society and local communities in the water resources planning and management?

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