Resolving Water Disputes Via Interstate Co-operation And Stakeholders' Engagement: A Case Study From Muda River Basin

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ABSTRACT: At the time of writing, Malaysia is experiencing a hot and dry "Super El Nino" phenomenon that is leading to a reduction of water in reservoirs, river and groundwater supplies. Water plays an important role in regional economic development as well as being a water source for industrial, domestic, agricultural, aquaculture, hydroelectric power generation and the environment. In Malaysia, river basins often fall into two or more states and because of that, disputes over water are common. Inter-states (in this case study, Kedah and Penang) water disputes over use of Muda River are entangled with Federal-States conflicts and compounded by rapid population growth, urbanization, economic and political issues. The inter-state water controversies between Penang and Kedah started due to logging of Ulu Muda forest reserve by Kedah State Government. Logging at the headwaters of Muda River threaten the water supplies for more than two million people living in Kedah and Penang. This paper highlights the current environmental and political challenges related to water resources in Kedah and Penang. The research aims at finding solutions to resolve the water disputes and maximise benefit-sharing of water use using a model developed through stakeholders' engagement. In-depth and semi-structured interviews with key stakeholders and report analysis are conducted at different institutional levels such as the national, river basin, community, government institutions and non-governmental organisations (NGOs). The findings show that there is strong perception among local residents and environmental NGOs that the logging in Ulu Muda forest reserve, which serves as an important water catchment area, has resulted in steep and rapid decline in biodiversity and affected the quality and quantity of the water supplies.This case study can serve as an important foundation for accessing the negotiations between Kedah and Penang and fostering interactive interstate water co-operation not just in Muda River Basin but other shared watercourses. The approach can contribute to reducing the impacts of water dispute among states and to advancing water security in Malaysia.

Keywords: Interstate Co-operation; River basin authority; Stakeholders, Water Conflict

JEL Classifications: Q25; Q28; Q57

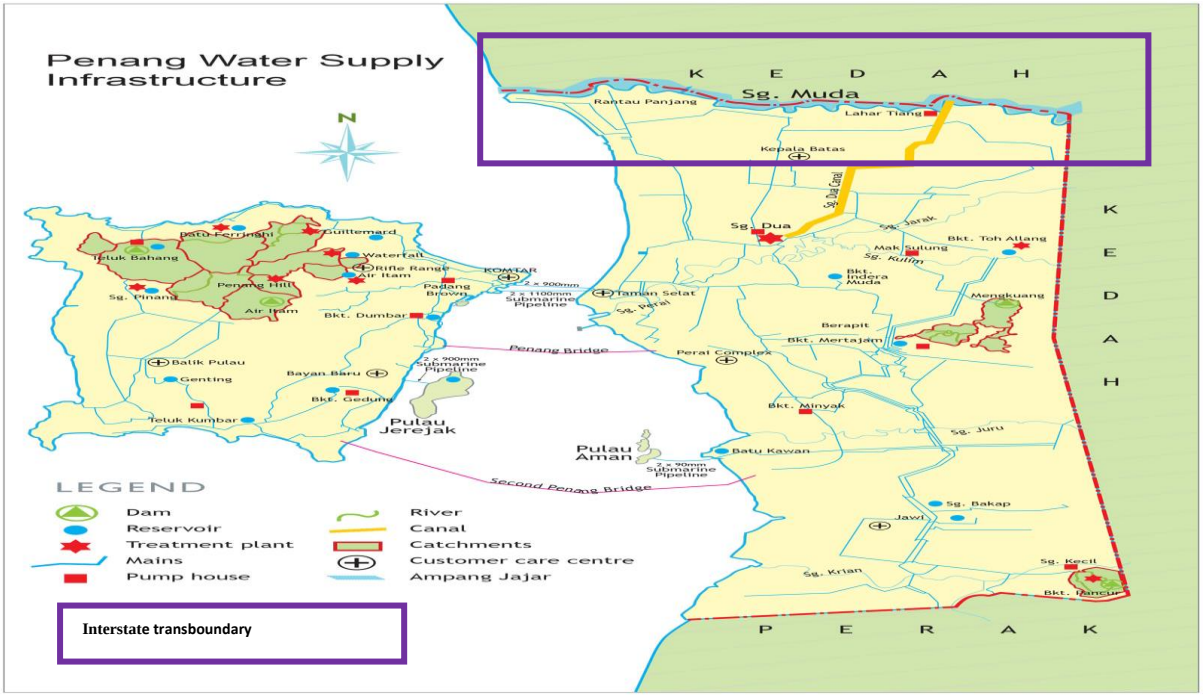
1. Introduction

Water is abundant in Malaysia with average annual rainfall of 3000 mm which is equivalent to about 990 billion m^3 (Hasan et al, 2013). However, in recent years, Malaysia is experiencing water scarcity in certain states due to inadequte water resources recharge, high water demand, pollution,

degradation of catchments, low efficiency water in agriculture, institutional and legal issues (Ti and Facon, 2002). With the hot and dry "Super El Nino" phenomenon the situation has worsened, which leads to a reduction of water in reservoirs, river and groundwater supplies. In Malaysia, the State Governments are accountable for natural resources such as development, operation and maintenance of water supplies, land and forest (Ti and Facon, 2002; Azhar, 2000). Water supply matters fall under jurisdiction of the Federal Government only when there is an inter-state water dispute arising from river basin or water reservoirs cross state boundaries (Azhar, 2000).

Muda River basin crosses the state boundary of two northern states in Peninsular Malaysia, namely Kedah state and Penang state. This situation inevitably gives rise to water disputes over the use of the Muda River. The upstream and middle streams belong to Kedah while the downstream section forms an interstate boundary between Kedah and Penang (Figure 1). The length of Muda River is 180km and has a drainage area of 4,210 km^2. Muda River basin covers 329,760 km^2 of total land surface area in Malaysia, of which 160,000 hectares are forest, namely Ulu Muda forest (Table 1). Ulu Muda forest is the headwater of the basin and serves as an important water catchment for both states (Sim et al, 2015).

Figure 1. Muda River basin (Sg.= Sungai/river)



Source: PBAPP, 2015; http://pba.com.my/?page_id=571

Water conflicts between Kedah and Penang started in 2002 when Kedah State Government proposed helicopter logging in the Ulu Muda forests (Azhar, 2000). The logging of the Ulu Muda forests will destruct and degrade the 4210 km^2 water catchment area that provides as much as 96% of Kedah's and 80% of Penang's water supplies and affect the livelihoods of more than two million people in both states (Chan et al., 2002).

In 1982, Penang and Kedah signed a government-to-government memorandum of understanding (MoU). This MoU facilitated the construction of the Ampang Jajar Barrage. It clearly states that the boundary between Penang and Kedah is at the centre of the River Muda

Table 1. Forest reserves (FR) in Ulu Muda area

Name of Forest Reserve	Area (Hectare)
Ulu Muda	105,060
Pedu	15,299

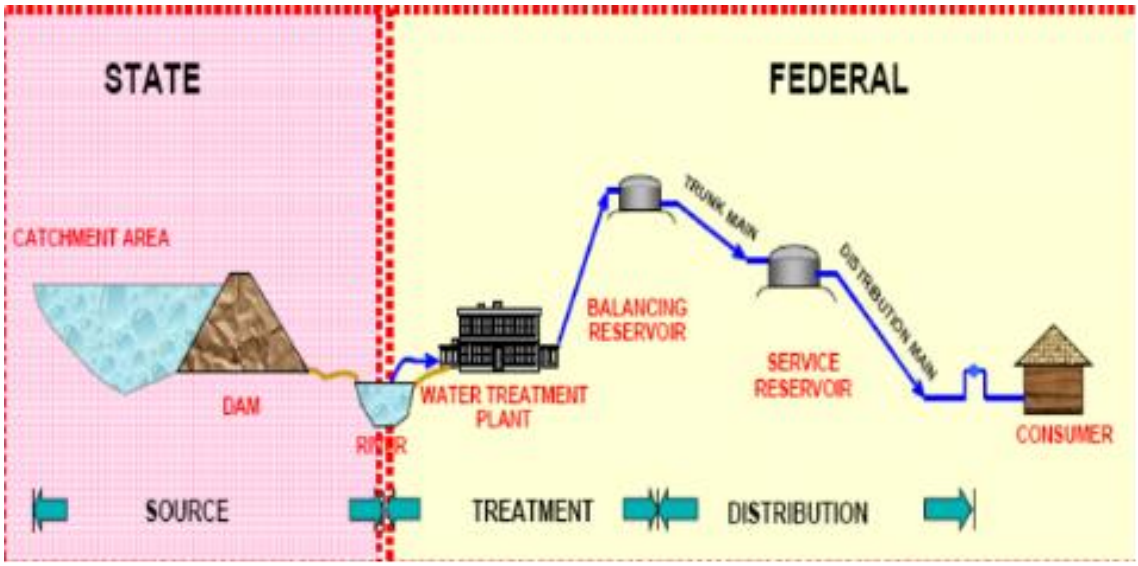
Padang Terap	12,785
Proposed Bukit Keramat	10,226
Chabar Besar	8,827
Proposed Bukit Saiong	8,191
Proposed Ulu Muda (addition)	1,359
Chabar Kecil	1,184
Total	162,931

Source. Kedah State Forestry Department Annual Report 2003

2. Issues and Challenges

Under the Malaysian Constitution, water is a federal, state and local issue. However, decisions on the river and water resources are made solely by the state without public concern, and this makes the system complicated and non-transparent (Sim et al., 2015; Chan, 2004). It is also stated that although water resources in Malaysia are treated as state resources, the federal government has specific power over national water supply works, as well as the rivers and canals which cut across state borders, except those which are regulated by an agreement between states concerned (Figure 2) (Chan 2004). Water in Malaysia is managed by the Ministry of Natural Resources and Environment (NRE). The Department of Irrigation and Drainage, under the direction of the NRE, has over the years taken on new and expanded responsibilities. Treated water is managed by Ministry of Energy, Green Technology and Water (KeTTHA). SPAN Malaysia (National Water Services Commission) is under the direction of KeTTHA.

Figure 2. Water management in Malaysia



Source: Nor 'Aini Abdul Wahab, 2011

There is a lack of transparency and communication in water resource management in Malaysia as the states make their decisions on water and natural resource management issues without any kind of consultation with the public. Malaysia still practises the Top-Down Government-centric design in the management of rivers. State governments in Malaysia make its decisions on water management issues without public concern and information is not easily accessible to the public (Sim et al., 2015; Chan, 2004; Chan et al., 2002). Overlapping, fragmented and competing responsibilities among the Federal, state and local institutions exist as there is no single agency or committee entrusted with the overall responsibilities of managing the Muda River basin (Ti and Facon, 2002; Rahman and Khalid, 2009).

Water governance in Muda river basin is quite sophisticated due political discontinuity at the state and federal level. Different political parties have different master plans for the management of Muda river basin. For instance, when the Penang state government initiated the need to stop the heli-logging in Ulu Muda water catchments areas within Kedah state in 2002 by engaging the intervention from the Federal government, the Kedah state government (aligned with the opposition party) showed some reluctance as most of their income is derived from logging activities. The logging subsequently started again a year after as there was no intervention from the Federal government and the local authority is prone to accept their instructions from the Kedah state government party official in charge.

3. Methods

This case study was carried out on both primary and secondary data. Primary data were collected via field research and observation. Secondary data were collected from published sources such as government reports, NGO reports, reports from research organisations, journal papers, published data, news reports, and other relevant secondary data. This is complemented using in-depth and semi-structured interviews with key stakeholders and report analyses were conducted at different institutional levels such as the national, river basin, community, government institutions and non-governmental organisations (NGOs). The potential stakeholders were identified and selected using snowball sampling (whereby participants make suggestions of further people to contact to engage in the research). The relationship between the stakeholders was investigated using Social Network Analysis and knowledge mapping. Social Network Analysis and knowledge mapping provide understanding of the communications and influence patterns between stakeholders in social circles and the fundamental relationship between the stakeholders.

4. Data Analysis

Analysis of data is based on FIELD methodology (an acronym of Framework of Incentives to Empower Local Decision-makers) to study and understand the relationships between the stakeholders and reasons behind the success or failure of the policy regulation. Table 2 summarizes the key stakeholders identified in the upper and downstream sections of the Muda river basin.

Table 2. Relevant key stakeholders in Muda river basin

Upstream	Downstream
Kedah State Forestry Department	Penang State
Syarikat Air Darul Aman Sdn Bhd (SADA)	Penang Water Supply Corporation (Perbadanan Bekalan Air Pulau Pinang Sdn Bhd - PBAPP)
Muda Agriculture Development Authority (MADA)	
Department of Irrigation and Drainage, Kedah	Department of Irrigation and Drainage, Penang
Lembaga Sumber Air Negeri Kedah	Badan Kawal Selia Air Pulau Pinang
Kedah State Economic Planning Unit (UPEN Kedah)	Penang State Economic Planning Unit (UPEN Penang)

Source: Author

Table 3 summarizes the main obstacles faced by Kedah and Penang stakeholders at Muda River basin.

Table 3. Main obstacles in Muda river basin

State	Sector	Obstacle 1	Obstacle 2	Obstacle 3
Kedah	Water	Lack of financial resources	Conflicts of interest	Lack of participation from the public or NGOs
Penang	Water	Degree of regulatory responsibilities	Conflicts of interest	Lack of participation from the public or NGOs

Source: Author

A limited degree of regulatory responsibilities can be observed in Penang in the management of Muda river basin especially at the upstream. Penang state does not have the power to set the regulations and enforce them. The lack of financial resources can be seen in the case study in Kedah due to the status of Kedah as rice bowl of Malaysia (Melissa, 2016) and because of that, the state is less developed as compared to Penang state. The conflicts of interests can be observed in both Kedah and Penang. This is due to the decentralised water governance system in Malaysia, and there are several agencies and departments at all level (federal, state and local) involved in implementation and development of water resource policies at both the state and local level causing fragmented and overlapping roles among the institutions.

Lack of participation from public stakeholders is identified as one of the obstacles as top-down river management practised by Malaysia government and information was not easily accessible to the public.

5. Main Results

The findings show that there is strong perception among local residents and environmental NGOs that the logging in Ulu Muda forest reserve, has resulted in a steep and rapid decline in biodiversity and affected the quality and quantity of the water supplies. Even though there was a coalition of NGOs in the upstream section of Muda River basin there is a lack of participation of NGOs in protecting Ulu Muda as management is undertaken by Kedah state. This research can be used as an attempt to engage the NGOs in the environmental governance process in Ulu Muda and as dissemination information tools that will empower the local communities about their rights, privileges and responsibilities in Ulu Muda management. There is no inter-state river basin committee in managing the Muda river basin.

6. Concluding Remark

This case study can serve as an important foundation in accessing the negotiations between Kedah and Penang to foster interactive interstate water co-operation not just in Muda River Basin but other shared watercourses. The approach can contribute to reducing the impacts of water dispute among states and to advancing water security in Malaysia. Developing a framework for stakeholders that are benefiting from the Ulu Muda forest to contribute financial resources for the management and conservation of this area would be a strategy to support the basin. As would developing an inter-state river basin committee to engage participation of NGOs and the public. One challenge would be a lack of transparency or clarity of the respective functions. To address this the fragmented and overlapping of roles among the institutions would need to restructure and consolidated.

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