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**ULU MUDA FOREST: IN THE PERSPECTIVE OF  
WATER CATCHMENT MANAGEMENT**

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**ABSTRACT**

Malaysia receives abundant rainfall averaging 3,000 mm annually that contributes to the continuous water resources to the country. However, issues arise on how to manage water supplies effectively and how to sustain the availability of clean water despite other industrial activities. Looking at the northern region of Malaysia, the 160,000 hectare of Ulu Muda in Kedah is the largest water catchment area that face the same issue. Even though Kedah is not facing any major issues on water resources since it has adequate catchment area, but the given situation of deforestation or logging activities at the area of the forest will someday bring effect on the water supplies to Kedah, Pulau Pinang and Perlis. This paper aims to address the issue together with measuring the water management system in Kedah.

**Keywords:** Water Catchment Management, Ulu Muda Forests, Sustainable Water Catchment.

## INTRODUCTION

Managing water supplies and ensuring the availability of clean and potable water has become a major issue in Malaysia. As one of the most basic human needs, water support our livelihoods. It is a simple saying that our water resources are irreplaceable. Forests and rivers play many important roles to serve as the water catchment area that naturally keep water for continuous supply to every creatures in the Earth. Water catchment area is defined as an area of land bounded by natural features like mountains or hills over which water from the rain flows to the low point that eventually flows into a dam, river, bay or the ocean (Department of Environment and Science of Queensland Government, 2021). This natural gift of forested catchments in tropical countries brings many benefits in the term of water production, soil conservation, biodiversity and other downstream activities (Mohamad Suhaily Yusri Che Ngah & Zainudin Othman, 2010).

As the world evolves, rapid development and urbanization also move in the same way which result in subsequent deforestation that change the natural hydrological conditions and infiltration rate of river system in Malaysia (Khairul Rahmah Ayub et al., 2009). To avoid the unwanted events due to this rapid change in nature and in order to have a balance natural hydrological, the sustainable management of water catchment is the aspect that need to be paid extra attention. Mohamad Suhaily Yusri Che Ngah and Zainudin Othman (2010) has stated that this management of water catchment area could ensure all development activities will have an acceptable impact on both water yield and water quality.

Based on this issue, the researcher is interested to see further on the water catchment management in Kedah which according to Muhd Ekhwan Toriman et al. (2009), major fresh waters were obtained from two reservoirs operated namely Pedu Dam and Ahning Dam in the state. This article highlights the case of Ulu Muda Forest which is the largest water catchment area in the northern region of Malaysia where the rainwater is collected in the water catchment area and flows into Sungai Muda. The Ulu Muda Forest is facing critical threats from the activities of deforestation and logging which slowly effects the water supply to the three states in north of Malaysia which are Kedah, Pulau Pinang and Perlis that are located within Malaysia's Northern Corridor Economic Region (NCER).

## **METHODOLOGY**

Most of the research methodology is based on the existing literature review including websites and news articles on water management and issues related to the water catchment in Malaysia.

## **LITERATURE REVIEW**

The Ulu Muda Forest Reserve (UMFR) and its surrounding forested areas (known as the Greater Ulu Muda Forest) is the largest water catchment area in the northern region. UMFR covering 163,000 ha (Elena Koshy, 2020), is located in the north-west of Peninsular Malaysia, specifically in the State of Kedah. Ulu Muda Forest Reserve (UMFR) forms part of a massive water catchment in Kedah that drains either into Muda dam or into Sungai Muda downstream from the dam and supplying water to 4.2 million Malaysians across three states; Kedah, Penang and Perlis (Sim Lay Mei, Gemma Carr & Chan Ngai Weng, 2017 in Nirwani et al., 2021) together with the supply of water for industries and household use (Andrew Sia, 2018). UMFR has been the centre of inter-state dispute, mainly in terms of water supply as the forest is instrumental in supplying fresh water for millions of Malaysians (Kereen et al., 2021). UMFR comprising Ulu Muda, Pedu, Chebar Besar, Chebar Kecil and Padang Terap forest reserves is one of the largest natural heritage areas in the northern region (Elena Koshy, 2020). Three dams namely Pedu dam, Muda dam and Ahning dam are located within the forest complex (Figure 1). The forest complex treats raw water to meet 70 percent, 96 percent and more than 80 percent of Perlis, Kedah and Penang's daily water needs respectively (Elena Koshy, 2020).

As the natural water catchment area, UMFR plays its role to fulfil the water demand for people and paddy industries for the nation as said by the former Menteri Besar of Kedah in 2018, Datuk Seri Mukhriz Tun Dr. Mahathir (Andrew Sia, 2018), the function of the forest has been disturbed by the upstream activities including logging and deforestation. According to Datuk Jaseni Maidinsa, Penang Water Supply Corporation (PBAPP) Chief Executive Officer, he said that at the rate of logging in Ulu Muda, the forests would be finished in about 12 to 15 years and serious water crisis might arise (Lo Tern Chern, 2018). The article also wrote the statement by Chow Kon Yeow,

Penang Chief Minister which he said, this is a serious matter because more than four million people and thousands of businesses in the three states stated earlier would get involve in the potential regional water crisis caused by the logging activities in Ulu Muda forest. Butler (2019) said that, climate changes like heavy rainfall would result in the vulnerable basin area due to deforestation and landscape changes. These changes in land use have affected the hydrological variables in a watershed, switching the hydrological cycle and flood vulnerability of the basin (Hafizan Juahir et al., 2011). Upstream uncontrolled development give rise to destruction of water catchments, severe soil erosion, landslides, and ultimate siltation and sedimentation of rivers downstream (Chan & Wan Ruslan 1997).

The changes of natural ecosystem stated above is closely related to the role of the authority that governs the management from top to bottom. According to Sim et al. (2017) water governance in Muda River basin is quite sophisticated due to political discontinuity at the state and federal level. Different political parties have different master plans for the management of Muda river basin. In 2003, according to the late Tan Sri Azizan (former Menteri Besar of Kedah) said that logging activities could not be stopped unless the federal government paid Kedah RM100 million annually as the logging is one of state's main source of income (Andrew Sia, 2018). Here arise the conflict between the demand for clean water and the need to generate income for the state through the logging of the forest (Butler, 2019). In order to solve the conflict and to ensure the sustainable development regarding UMFR, all government and agencies need to manage the issue in an integrated and holistic manner. Based on this situation, every single party must go back to obey and comply the law to find proper solution regarding this matter.

**Figure 1**

*Major Rivers, River Basins in Kedah and Ulu Muda Forest Complex*



(Source: H. Maketab & N. F. Mohd Ani, 2021)

## Law, Water Resources in Kedah

According to Zaini et al. (2022), the state government has prepared a water enactment to replace the Water Act 1920. The state of Kedah has created the Kedah Water Resources Enactment 2008 as its own legislation related to water resource management. This legislation of 2008 enactment has narrowed down to Section 36 that focused on the declaration of water conservation areas which mentioned in details at Table 1. In addition, the state of Kedah also established a statutory body institution, the Lembaga Sumber Air Negeri Kedah (LSANK),

which has a neat and robust legal structure and jurisdiction (Zaini et al., 2022). This would ensure that proper measures are instituted and a chain of responsibility as well as accountability is established.

**Table 1**

*Kedah Water Resources Enactment 2008*

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**Kedah Water Resources Enactment 2008 (State Government)**

***Section 36***

***Water conservation areas***

*Declaration of water conservation areas*

*(1) The State Authority may, on the advice of the Board, by order published in the Gazette declare a specified area of land or water body to be a water conservation area:*

*(a) to ensure that a particular water body is adequately protected from change in flow, contamination or degradation; or*

*(b) for the purpose of being or intended to be used as water catchment area of an impounding reservoir or water supply intake.*

*(2) The declaration of a water conservation area shall incorporate a statement of-*

*(a) the limits of the area and the purpose of declaring such area as a water conservation area;*

*(b) the types or classes of activity or development to which specified measures or work are to apply;*

*(c) the types of activities that are prohibited;*

*(d) the terms, conditions and restrictions that apply to activities, measures undertaken or development within the area respectively; and*

*(e) the body empowered to manage the area.*

*(3) The statement referred to in subsection (2) shall be taken into account by any public authority in issuing a licence, permit or approval for activities in a water conservation area.*

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*(Source: Government of Kedah Darul Aman Gazette, 2008)*

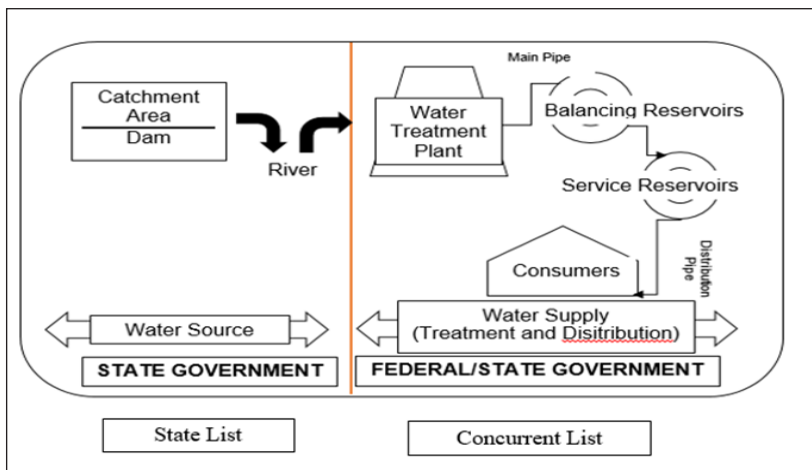
The Kedah Water Resources Enactment 2008 ('2008 Enactment') serves as the primary legal instrument where water resources is concerned for the State of Kedah. According to Siti Zuhaili Hasan and Sarah Aziz (2018) the 2008 Enactment makes provisions for the establishment of a *Lembaga Sumber Air Negeri Kedah* ('Board') with a mandate to provide for the integrated management of use, development and protection of water resources in Kedah (Government of Kedah Darul Aman Gazette, 2008).

In the Federal Constitution, among the jurisdictions set out in the State List is water which includes water supply and rivers, while irrigation is listed under Concurrent List (Zaini et al., 2022) which means each state has its own legislation related to water. In order to facilitate restructuring, the existing State List at that time needs to be amended to transfer water matters to the Concurrent List. Through the amendment, the Federal Government is responsible for regulating matters related to water or ‘water supply and services’, while the state government remains in matters related to the governance of water resources (Zaini et al., 2022).

The federal constitution established water originally under the jurisdiction of state governments (Sim et al., 2017; Zaini et al., 2022). However, effective on 21 March 2005, the Malaysian Parliament approved an amendment to the Ninth Schedule of the Federal Constitution to transfer matters related to water supply and services from the State List to the Concurrent List (except for Sabah and Sarawak). This allows governance and funding to be more organized to provide water services to all users as illustrated in Figure 2 (Zaini et al., 2022).

**Figure 2**

*Jurisdiction of the Federal Government and State Government*



(Source: Zaini Ujang, Ching Thoo A/L Kim, Md. Nasir Md.Noh, Razul Ikmal Ramli, Azmi Aris, Kassim Tukiman & Haniffa Hamid, 2022)

## **Water Catchment Areas**

As mentioned earlier, the forests of Ulu Muda play an important role in providing a clean and reliable source of water to Kedah, Penang and Perlis water supply for domestic and industrial use and for irrigation. The preservation of the Ulu Muda catchment in Kedah is a federal issue because it involves three states' water supply as well as the conservation of a natural forest area for the benefit of all Malaysians (Sri Veitheki Ramasamy, 2017).

From several research sources and media publications, it can be concluded that many parties have taken action and views on gazetting the Ulu Muda area as a water catchment area and to be preserved from further disturbance. The Kedah State Government through the Kedah Development Plan 2035 has also made environmental sustainability one of the main thrusts in this plan. In Core 6, the Kedah 2035 development plan aims to gazette Ulu Muda as a State Park (Bahagian Perancangan Ekonomi Negeri, n.d).

Referring to Table 1 and Table 2, namely the Dewan Rakyat records, through the answers of the Minister of Natural Resources and Environment in 2018 and the existing law which is the Kedah Water Resources Enactment 2008 need to be prioritized to preserve this very precious gift of nature from being continuously disturbed.

**Table 2**

*Statement of Ministry of Energy and Natural Resources (2018)*

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### **Dewan Rakyat Records (Federal Government)**

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Among the actions taken by the Kedah State Forestry Department in preserving and maintaining the catchment area in the Muda Dam are;

- (i) in principle the State Forestry Department does not support or recommend logging activities in watershed forest areas;
  - (ii) gazette and maintain Ulu Muda Forest Reserve with an area of 105,059 hectares and Bukit Saiong Forest Reserve with an area of 8,191 hectares as Permanent Forest Reserves under section 7, National Forestry Act 1984 (Act 313);
  - (iii) classify 16,229 hectares of Ulu Muda Forest Reserve and 6,266 hectares of Bukit Saiong Forest Reserve as watershed forest areas under section 10(1)(e), National Forestry Act 1984 (Act 313);
  - (iv) increase enforcement activities and monitoring of logging activities that have been approved by State Authorities in forest areas classified as Timber Production Forests under Permanent Procurement section 10(1)
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(continued)



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**Dewan Rakyat Records (Federal Government)**

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- (a) of the National Forestry Act 1984 (Act 313) so that licensees comply license conditions and requirements and regulations under the Malaysian Criteria and Indicator (MC&I) standards which emphasize the regulation of environmental stability, maintaining the quality of water resources and the well-being of local community life; and
  - (v) Carry out tree planting activities from marketable tree species in temporary “matau” areas, towing alleys and open areas in areas that have been licensed to speed up the process of restoration and preservation of the area.
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*(Source: Pertanyaan Bukan Lisan Dewan Rakyat Parlimen 13, 2018)*

Through oral questions in the Dewan Rakyat, among the latest information regarding the status of the Ulu Muda forest is based on the minister’s answer on 6 August 2020. According to the Minister of Energy and Natural Resources, ‘the total area of the Ulu Muda Forest Reserve is 106,418 hectares and has been gazetted as a Permanent Forest Reserve (HSK) under Section 7 of the National Forestry Act 1984 [Act 313] by the Kedah State Authorities in 1932 and the remainder in 2013 through the Kedah Darul Aman Government Gazette no.380 dated 24 September 1932 and the Kedah Darul Aman Government Gazette no. 1342 dated 17 January 2013’.

He added, ‘of that amount, 16,229 hectares have been gazetted as Watershed Forests (Kedah Darul Aman State Gazette no.127 dated 13 March 2008 and Kedah Darul Aman State Gazette no.341 dated 10 May 2018) while an area of 11,118 hectares has been gazetted as Hutan Taman Negeri (Kedah Darul Aman State Government Gazette no. 341 dated 10 May 2018) under Section 10 (1) in the same act’ (*Pertanyaan Lisan Dewan Rakyat Parlimen 14, 6 August 2020*). By referring to this statement, it is clear that the government’s efforts at the federal and state levels are in an effort to take care of this resource as well as possible. But it should be remembered, all parties should really make each of these existing laws work transparently and successfully.

These issues require long-term planning, implementation and monitoring, and should involve different parties. Such restoration and rehabilitation typically involve protective measures, tree planting initiatives, and natural recovery accelerating measures. As mentioned by Sri Veitheki Ramasamy (2017), Ulu Muda Forest Reserve is not just Kedah’s problem as it serves the other NCER states as well and full cooperation from different stakeholders is required. Therefore,

Penang and Perlis should provide continuous support to assist Kedah in protecting the forest reserve to make it a sustainable water catchment area. Mohamad Firdaus Abdullah (2021) stated that with the availability of water supply, it guarantees a balanced along with competitive life and drives to a better future. Without a good supply of water, it would be impossible for humans to survive and start early settlements wherever they were in the world.

## **CONCLUSION**

Towards protecting and developing water resources in a sustainable manner is in progress. Water supply has made life more pleasant and gives better life over time. The government is committed on promoting sustainable development and environmental protection as inseparable from water resources. The community must also work together to ensure that the Ulu Muda area can be well maintained as a water catchment area. By looking at UMFR as the water catchment area that provides the main source of water in the river, it must be protected to ensure a clean and long-lasting water source and control the water catchment area from being polluted. Compatible with The Kedah Water Resources Enactment 2008 provides the regulatory through sustainable use of water resources. We need to save water so that the next generation can enjoy what we are enjoying now.

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