

## Formulation of Water Supply Policy and Law In Kedah: The Role of the Kedah State Legislative Assembly (1960-1964)

MOHD FIRDAUS ABDULLAH<sup>1</sup>, ARBA'IYAH MOHD NOOR<sup>2</sup> & NORAINI MOHAMED HASSAN<sup>3\*</sup>

<sup>1</sup>*Centre for Research in History, Politics & International Affairs,  
Faculty of Social Sciences & Humanities, Universiti Kebangsaan Malaysia*

<sup>2,3</sup>*Department of History, Faculty of Arts and Social Sciences,  
Universiti Malaya, Kuala Lumpur, Malaysia*

Corresponding author: [ainnorima@um.edu.my](mailto:ainnorima@um.edu.my)

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### Abstract

This study aims to examine the formulation of policies and laws related to water supply management in Kedah through debates in the Kedah State Legislative Assembly between 1960 and 1964. The main objective of this study is to analyze how representatives of the people use legislative power in the State Legislative Assembly. Kedah to form a water policy, paying particular attention to aspects of infrastructure development, water distribution between urban and rural areas, as well as the tension between the state government and the federal government in managing water resources. This study uses a qualitative methodology with a content analysis approach to primary sources such as hansard and official state government documents. Through an in-depth analysis of this debate, the study examines the interaction between politics, post-colonial development, and the management of water resources as a limited public resource. According to the research findings, the Kedah State Assembly debate is not just about the technical aspects of managing the water supply; it is also a political tactic used to garner support and maintain political stability during that time. This study advances a more comprehensive knowledge of how laws affect Malaysia's natural resource development. This study is important in the current context because it shows how political influence and the implementation of water laws affect access and distribution of water. In the current water situation in Malaysia, the issue of water management imbalance is still relevant, the imbalance between urban and rural development continues to be a major challenge. This study also provides legal insights by revealing shortcomings in legislative formulation and the uneven standardisation of water laws, while at the same time exposing the power dynamics between the state and federal governments that shaped the law-making process. More transparent standardization of water laws and fair implementation, as suggested by this study, could help ensure wider access to clean water across the country.

Keywords: Water Supply Management; Legal Policy; Kedah State Legislative Assembly; Post-Independence Development; Kedah

### Introduction

The State Assembly (DUN) is a legislative body that plays an important role in formulating state policies and laws, including water supply management.<sup>1</sup> Kedah, as an agricultural state that depends on water resources for the survival of domestic use and the agricultural sector, especially rice crops, considers the State Assembly as an important institution in determining the direction of the state's water policy.<sup>2</sup> This situation can be seen in the early 1960s, when the newly formed Kedah state

assembly began to discuss the need for water supply through a presentation on the Water Supply Fund Budget Paper No. 16 of 1960, the Water Supply Law and consequent questions and answers regarding water supply to residents in the state of Kedah.<sup>3</sup> Previous research on the discussion of water supply issues in the legislature in Malaysia is quite limited, especially from the point of view of the influence of legislative bodies such as the State Assembly and Parliament on the formulation of policies related to water resource management. Most previous studies focus more on the technical aspects of water management or the economic impact of water infrastructure development. For example, studies on water supply at the state level often focus on case studies such as the water crisis in Selangor, Penang or the development of large dams such as the Muda Dam in Kedah.<sup>4</sup> However, studies that examine the role of legislation and debate in the State Legislative Assembly or Parliament in enacting water policy are very hard to find. In this study, the emphasis is on the historical legal process of the early 1960s rather than on current legal frameworks. By analysing debates, budget papers, and legislative questions of that period, the article situates Kedah's water policy within its formative legislative context. While the article acknowledges existing research on contemporary water law and governance, its novelty lies in uncovering how the legislative process in the 1960s shaped water supply policy and how these early dynamics continue to resonate with present-day challenges. Research on the influence of legislation in dealing with water issues is mostly found in the context of environmental law or administrative law, but specific research with regard to the debate on water legislation in the State Assembly or Parliament is limited.<sup>5</sup>

Conversely, in countries such as Australia, the United States, and India, there are more studies that specifically examine how water supply issues are discussed and addressed in state and national legislatures. For example, in Australia, the legislative formulation of water policy through the Water Act 2007 has been extensively studied to understand how the law affects water management in the Murray-Darling river basin, one of the largest river basins in the world.<sup>6</sup> This study shows the importance of law in controlling access and distribution of water resources in countries exposed to water crisis due to climate change. Meanwhile, in the United States, studies focusing on the California Water Law provide a clear picture of conflict between agricultural needs and the growing urban population if one reads the discussion in the process of enacting such laws.<sup>7</sup>

In the context of Malaysia, the issue of water supply also involves tension between the state and federal governments, especially in the management of water resources across state borders.<sup>8</sup> Although this matter has been debated in Parliament, such as in the issue of the water agreement between Johor and Singapore, research on the debates and policies enacted by State Legislative Assembly and parliament on water issues is still limited. This study focuses on the formulation of policies and laws related to water supply management in Kedah, with a specific focus on the debate in the Kedah State Legislative Assembly from 1960 to 1964. This period is important because it is the early post-colonial era where state development policies, including in water resource management, began to be shaped by the state government with greater political influence than the federal government. Given that Kedah is entirely dependent on water resources for agriculture, particularly rice farming, managing the state's water supply is a crucial concern during this time.<sup>9</sup> Furthermore, urban growth like Alor Setar puts additional strain on the water infrastructure that already exists.<sup>10</sup> The state government's attempts to address the issue of unequal water distribution between urban and rural areas, upgrade the infrastructure for water supply, and get past the obstacles to enacting a fair and efficient water policy were all reflected in the discussion in the Kedah state assembly at the time.

The main objective of this study is to analyze the role of the Kedah state assembly in formulating policies related to water supply management during that period, as well as evaluate how the debate in the Kedah State Legislative Assembly affects the state's legislative and administrative decisions in managing water resources. The main question to be answered in this study is: How did

the Kedah state assembly as a legislative body use its legislative powers to regulate water resource management in the early post-colonial period?. The importance of this study lies in its contribution to a deeper understanding of how state legislatures such as the Kedah State Legislative Assembly play an important role in the management of critical natural resources, such as water, which is one of the basic elements in socio-economic development. In the post-colonial context, the policies and laws enacted in the not only have an impact on the construction of physical infrastructure but also on the political and economic stability of the state. This study also emphasizes the importance of understanding how legal mechanisms are used to address the challenges of managing limited water resources in states that depend on water for agriculture and urban growth. The implications of this study are not only relevant for Kedah but can also be an important reference in water management studies at the national and international levels, especially in the context of developing countries that face similar challenges. This study is very significant in the current context because it provides a clear picture of how political influence, and the implementation of water laws can affect access and distribution of water resources throughout the state. The disparity in water management between urban and rural areas is still a significant problem in Malaysia, where this issue is still pertinent today. When it comes to infrastructure development, urban areas are frequently given precedence over rural ones, which results in disparities when it comes to access to clean water.

### Literature Review

This study leverages various previous studies that discuss issues related to water supply management, public resource legislation, and political interaction in the formulation of water-related policies. Although there are many previous studies that focus on the technical and economic aspects of water management, this study focuses on the legal and political aspects, which have not been discussed in depth in the context of Kedah. Therefore, this literature highlight focuses on foreign studies and domestic studies related to law and politics in water resource management. Studies by Wescoat, James L. and White, Gilbert F. in their book, *Water for Life: Water Management and Environmental Policy*, offer important insights into how water management involves multiple aspects, including politics, law, and environment. The significance of legislation in managing water resources as a public benefit is emphasized in this work, particularly in nations with limited water supplies. Wescoat and White offer a thorough examination of how state and federal laws influence water policy in the US, which serves as a crucial foundation for comprehending how the law contributes to the fair distribution of water resources.<sup>11</sup> This study is significant in the context of this research because it emphasizes the role that laws play in guaranteeing fair access to water. However, the book does not cover the problems encountered by developing nations like Malaysia in favour of concentrating more on the setting of established nations.

The analysis by Bakker, K. in her book *Privatizing Water: Governance Failure and the World's Urban Water Crisis* is another significant piece of work. Bakker examines failures in urban water governance in developing countries and discusses the role of law and politics in ensuring adequate water supplies for all. This book focuses on how failures in water legislation cause inequality in water access, especially in urban areas. Bakker's study is very relevant to this study because it outlines how the role of law and politics in water management can affect access and equality, especially in the context of Kedah which experiences an imbalance in the distribution of water between urban and rural areas. Nevertheless, Bakker focuses more on the privatization of water, while this study focuses more on the management of public resources at the state government level.<sup>12</sup> In a more contemporary study, Gleick, P. in his book *The World's Water Volume 7: The Biennial Report on Freshwater Resources*, discusses in depth the global challenges in freshwater management, including

legal aspects and distribution of water resources. Gleick emphasized that water laws should ensure a balance between domestic, industrial, and agricultural needs, as well as emphasize the right to water as a human right. This study contributes to current research by providing insight that laws related to water need to support a balance between political interests and people's right to access clean water. Gleick's contribution has an impact on this research because it helps strengthen the argument that the debate in the Kedah State Assembly on water management also involves elements of social justice and human rights. Nevertheless this study leaves a gap in the context of state-federal political interaction that is important in understanding the dynamics in Malaysia.<sup>13</sup>

In the context of water management in Malaysia, a study by Raja Zainal Abidin through his paper, *Water Resources Management in Malaysia: The Way Forward*, provides a comprehensive assessment of water management challenges in Malaysia. He emphasized the importance of sustainable and effective water resource management, while highlighting the government's role in ensuring fair access to water supply throughout the country. This study also outlines the legal and administrative challenges faced by the state and federal governments in managing water resources, especially when it comes to sharing water between states. Although the study is important to provide a comprehensive overview of water management in Malaysia, it does not discuss in detail the role of state legislatures or state legislatures in formulating policies related to water supply, which is the focus of this study.<sup>14</sup> Based on the article *the Development of Domestic Water Supply in the State of Kedah, 1957-1992* by Abdullah and Mohd Noor, this study emphasizes the development and implementation of domestic water supply plans in Kedah during that period. This research examines the challenges and solutions faced by the state government, as well as the relationship between current water supply problems and past developments. This study assists current research by providing a deep historical context of how state governments managed water supply through policies enacted in the early post-colonial period. The study also demonstrates how management concerns and a lack of funding impact the execution of water supply plans.<sup>15</sup> However, this essay focuses less on the political and legal role mentioned in the Kedah State Legislative Assembly and more on historical and technical elements.

The earlier literature offer a strong basis for comprehending the significance of politics and the law in managing water resources. The lack of attention paid to the function of state legislative bodies, like the Kedah State Assembly, in passing water-related legislation and regulations, particularly in developing nations, is a glaring weakness in earlier research. By concentrating on the Kedah State Assembly's involvement in developing policies pertaining to water supply management and investigating how political discussions impact legislative decisions pertaining to access to vital water resources, this study seeks to close that gap.

## **Theoretical Framework**

### ***Analytical Architecture and Theoretical Hierarchy***

This study adopts a layered analytical architecture. The primary lens is Water Politics, which treats water not merely as infrastructure but as a field of power, strategy, and allocation. Within this lens, legislative speech and budgetary decisions are read as instruments through which political actors prioritise constituencies, secure legitimacy, and stabilise authority. Two secondary lenses refine this reading: Public Law (to trace the state's positive obligations and competences over water as a public good) and Environmental Law (to track how normative commitments to resource protection and sustainability are translated, selectively, into enforceable rules. A contextual lens of post-independence state-building clarifies why rapid modernisation and electoral consolidation render water policy an arena where legal ideals are mediated by development imperatives.

### *Operational Definitions and Observables*

1. **Water Politics (primary lens).**  
Definition: The strategic use of water policy and infrastructure to produce political order, territorial cohesion, and distributive advantage.<sup>16</sup> Observables in the data:
  - (i) budget concentration in politically strategic districts;
  - (ii) justificatory narratives in Hansard linking water works to stability and prosperity
  - (iii) sequencing of projects that privilege capitals and industrial nodes over rural peripheries
2. **Public Law (secondary lens).**  
Definition: The set of legislative competences and duties through which the State guarantees equitable access to essential services. Observables:
  - (i) statutory provisions such as Kedah Water Supply Law No. 130, 1961 amendment, that authorise JKR to construct, regulate, and collect revenues.
  - (ii) debates invoking the State's duty to provide household water.
  - (iii) instruments of accountability such as fines, appointments, and standards and how they are applied across districts.
3. **Environmental Law (secondary lens).**  
Definition: Normative and regulatory commitments to protect sources, prevent pollution, and balance human use with ecological integrity.<sup>17</sup> Observables:
  - (i) references to protection of rivers and sources.
  - (ii) siting and capacity of treatment plants.
  - (iii) differences between the law on paper and actual enforcement patterns.
  - (iv) rural reliance on untreated sources despite legal provisions.
4. **Post-Independence State-Building (contextual lens).**  
Definition: Developmental priorities of a newly independent polity seeking growth, urban modernity, and administrative consolidation.<sup>18</sup> Observables:
  - (i) rhetorical coupling of water projects with modernisation and rice self-sufficiency.
  - (ii) alignment of legislative calendars with major schemes such as Muda.
  - (iii) path-dependent privileging of urban and strategic districts.

### *Integrating the Lenses, Hierarchy and Interaction*

Analytically, Water Politics drives the interpretation. It explains why legal provisions and environmental safeguards were applied unevenly. Public Law identifies what duties and powers existed. Environmental Law elucidates how sustainability ideals were framed. State-building clarifies the pressure to prioritise capitals and industrial nodes. In Kedah, these lenses intersect to show that legal sufficiency did not guarantee distributive equity. Legislative power and development imperatives mediated enforcement, producing a stable pattern, namely urban and strategic primacy and rural deferral, that the Findings document in detail.<sup>19</sup>

## Research Methodology

### *Design and Corpus*

This is a qualitative historical study employing thematic content analysis of (i) the Kedah State Legislative Assembly Hansard, 1960 to 1964, and (ii) administrative materials such as JKR annual reports, budget papers, and related state documents. The temporal window captures the formative post-independence phase when legislative competences and development priorities were being consolidated. The unit of analysis is the speech turn or documentary paragraph that addresses water supply policy, financing, siting, treatment capacity, enforcement, or distribution.

### *Coding Strategy and Theme Development*

Analysis proceeded in three passes.

1. Open coding, line by line, to flag segments related to allocation, legal duty, protection and enforcement, urban rural contrasts, delays or deferrals, and justificatory narratives.
2. Axial coding to group codes into four meta themes aligned with research aims. These were: T1 Allocation and Prioritisation, T2 Legal Competence and Duty, T3 Protection and Enforcement, T4 Urban Rural Distribution and Delay.
3. Thematic integration, mapping each meta theme to the analytical lenses primary, secondary, and contextual specified in the Framework.

Table 1: Codebook, excerpt

Code	Definition and decision rule	Typical indicators in Hansard or documents	Lens mapping
<b>A1_StrategicAlloc</b>	Allocation framed for capitals or industrial nodes	Large sums to Alor Setar or Kulim, phrases such as pusat pentadbiran or keperluan industri	Water Politics primary
<b>A2_RuralDeferral</b>	Deferral or queueing for rural schemes	Expressions such as “the scheme will be carried out after 1965,” “pending allocation,” or “subject to future funding”	Water Politics and Urban Rural theme
<b>L1_StateDuty</b>	Assertion of state duty or right to household water	Mentions of household standpipes, fee collection by state engineer	Public Law
<b>L2_EnforcementGap</b>	Provision exists but unevenly enforced	Fines and standards stated but not applied in rural districts	Environmental Law and Water Politics
<b>E1_SourceProtect</b>	River or source protection references	To preserve rivers, to prevent pollution.	Environmental Law

<b>U1_TreatmentCap</b>	Treatment plant capacity or siting	Upgrades in town plants versus absent rural plants	Environmental Law and Water Politics
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Source: Adapted and modified by the author based on Allan (2011); Sax (1970); Stone (2017); Waldner (1999); Warner et al. (2017); Wolf (2005); and selected Proceedings of the Kedah State Assembly published by the Office of the State Secretary of Kedah between 1960 and 1964. Full bibliographic details are provided in the reference list.

Table 2: Worked sample, mini table

Source and year	Extract, paraphrased or short quote	Assigned codes	Analytical note
<b>Hansard 1962</b>	Allocation for Alor Setar plant expansion and mains	A1_StrategicAlloc, U1_TreatmentCap	Strategic urban primacy, aligns with state building narrative
<b>Hansard 1963</b>	Pendang scheme after 1965 due to funds	A2_RuralDeferral	Systematic deferral of rural works
<b>Law No. 130, 1961 amendment</b>	Authorises JKR to regulate and collect, penalties for misuse	L1_StateDuty, L2_EnforcementGap	Duty articulated, enforcement uneven in rural districts
<b>JKR Report 1963</b>	Capacity upgrades in Alor Setar, rural reliance on rivers	U1_TreatmentCap, E1_SourceProtect	Confirms urban upgrades, rural gaps persist

Source: Adapted and modified by the author based on Allan (2011); Sax (1970); Stone (2017); Waldner (1999); Warner et al. (2017); Wolf (2005); and selected Proceedings of the Kedah State Assembly published by the Office of the State Secretary of Kedah between 1960 and 1964. Full bibliographic details are provided in the reference list.

Triangulation compared claims in Hansard against JKR and budget documents to verify allocations, siting, and timelines.

Table 3: Triangulation Procedure with examples

Claim in debate	Administrative corroboration	Triangulated inference
<b>Priority upgrade for Alor Setar plant, 1962</b>	JKR annual summary and budget lines for plant expansion	Confirms A1_StrategicAlloc and U1_TreatmentCap
<b>Pendang works deferred beyond 1965</b>	Project schedule or absence of disbursement in corresponding year	Confirms A2_RuralDeferral
<b>Enforcement under Law No. 130</b>	Presence of provisions but lack of rural enforcement records	Confirms L2_EnforcementGap, law on paper versus practice

Source: Adapted and modified by the author based on Allan (2011); Sax (1970); Stone (2017); Waldner (1999); Warner et al. (2017); Wolf (2005); and selected Proceedings of the Kedah State Assembly published by the Office of the State Secretary of Kedah between 1960 and 1964. Full bibliographic details are provided in the reference list.

Where Hansard stated a promise or justification, we examined whether disbursement entries, plant capacity notes, or project completions appear within the same or subsequent fiscal period. Absence or lag was coded as deferral. Presence was coded as delivered allocation.

### ***Reliability and Transparency***

Audit trail. All coded excerpts are archived by date, session, and page for replication. Peer debriefing. A second reader, internal, reviewed a sample to check code consistency. Disagreements were resolved through rule refinement as listed in the codebook. Reflexivity. We distinguish statutory ideals such as instruments and duties from allocation practices such as urban primacy and rural deferral to avoid conflating legal text with outcomes.

### ***Methodological stance and terminology***

Given the interpretivist and document historical design, we do not test hypotheses. Instead, we apply analytical lenses, Water Politics as primary, Public Law and Environmental Law as secondary, and Post-Independence State-Building as contextual, to interpret how legislation and debate produced patterned distributional outcomes.

## **Results**

### **Political Power's Impact on Kedah's Water Supply Allocation (1960–1964)**

Political pressures had a tremendous impact on Kedah's water supply management between 1960 and 1964. It had a role in how much money was allocated for the construction of water infrastructure. It is evident from the examination of the Kedah State Assembly debates that water resources were not allocated fairly but rather concentrated in places that were more strategically important from a political and economic standpoint. In order to guarantee that the regions they represented receive greater funding, particularly for water supply development projects, which were currently a top priority, the legislators in the DUN frequently utilized their political clout. Crucial disparities in resource distribution are evident from the discussion in the Kedah state legislature, where strategic urban and agricultural districts are prioritized while less politically and economically crucial rural areas are frequently ignored. Alor Setar, Kedah's principal administrative and commercial hub, was a prime example. Alor Setar was given a sizable allocation of \$2.5 million in 1961 to develop the city's water supply infrastructure, which included building main pipelines and expanding the water treatment plant's capacity to accommodate the city's expanding demand. Alor Setar's significance as the state capital that contributes significantly to the political backing of the state government had biggest allocation when compared to other regions. Maintaining a sufficient water supply in large towns like Alor Setar is crucial to retain-voter support, since it secured the political stability of the state administration.<sup>20</sup>

Furthermore, substantial allocations were made to important agricultural regions like Yan and Kulim. In Kulim for example, RM1.6 million was allocated to extend of the water supply system, which involves building minor dams and drainage systems for residential and agricultural usage, was funded with \$1.6 million in Kulim, an agricultural and industrial centre. Yan, known for growing rice and other agricultural products, received \$1 million to ensure adequate water supply for the agricultural sector that is the heart of the area's economy. Both of these areas play an important role in the state's economy, and this large allocation reflects how elected representatives from those areas use their political influence to obtain the resources needed to maintain agricultural productivity and political support from rural communities that depend on the agricultural sector.<sup>21</sup>

However, not all areas in Kedah get the same priority in water supply allocation. Rural areas that are less strategic such as Pendang, Pokok Sena, Padang Terap and Changlun are often left out of the DUN debate. Pendang, which is also an agricultural area, has not received sufficient allocation to improve water infrastructure, although the Pendang assemblyman, Tuan Syed Ibrahim Syed Kechik has raised the issue of water shortage in the area. Allocations to Pendang were significantly lower compared to areas such as Alor Setar and Kulim, and the promised water supply was only expected to be delivered in 1965, indicating a significant delay in the development of water infrastructure.<sup>22</sup> Changlun, a more remote rural area, also faces the same problem, where allocations for water supply systems are not prioritized, causing the area to continue to face severe water scarcity.<sup>23</sup>

### **Water Infrastructure Development in the Post-Colonial Era of Kedah**

After Malaysia's independence, Kedah faced a major challenge in the development of water infrastructure, which became an important focus in the debate of the Kedah State Legislative Assembly (DUN) from 1960 to 1964. The development of water infrastructure is considered one of the main steps to modernize the state of Kedah and meet socio-economic needs, a growing economy, especially in the agricultural and domestic sectors. In addition to being crucial at the time to provide a sufficient and clean supply of water, infrastructure development also came to represent advancement and growth in the post-colonial age.<sup>24</sup> One of the largest projects discussed during the 1962 DUN debate was the Muda Dam's construction, which became a crucial component of the state government's attempts to boost water storage capacity and guarantee an adequate supply of water to the agricultural sector, particularly for the irrigation of rice fields in regions like Yan and Kubang Pasu. A total of \$4.5 million was allocated for the project, the majority of which was utilized to construct a dam and water drainage system spanning 12,000 hectares.<sup>25</sup> The 'Malaysian Rice Tank' dam is intended to provide constant irrigation to the rice fields, which are a vital part of Kedah's economy. This is a critical step in guaranteeing the agricultural sector's prosperity and the local farmers' survival.<sup>26</sup>

Additionally, a significant topic of discussion at the State Legislative Assembly was the expansion of water infrastructure in rural areas. The state government set aside \$6,437,980 in 1963 to upgrade the state's water drainage infrastructure. This drainage system is necessary to sustain population expansion and boost agricultural output in regions that have historically been underdeveloped. The project includes the construction of a main drainage pipe and a larger water storage tank to meet the increasing demand of the local population.<sup>27</sup> However, the development of water infrastructure in rural areas often faces challenges, especially in terms of cost and logistics. Remote rural areas such as Pokok Sena, Pendang and Sik despite receiving allocations, faced delays in project implementation due to lack of sufficient financial resources and imbalance in allocations between urban and rural areas. In state assembly debates, representatives from rural areas often raised the issue of this delay, which causes dissatisfaction among local residents who had to rely on traditional water sources such as wells and rivers. For example, Che Hamidah Omar who represented Pokok Sena, she highlighted the water supply scenario in Pokok Sena. She told the assembly almost the entire population in Pokok Sena had to depend on natural water sources such as rivers. During the last dry season, villagers in Kg. Palas Mukim Gajah Mati, Kg. Nawa Mukim Nawa Lesong and Kg. Kedondong Mukim Derang depended solely on river water.<sup>28</sup>

The importance of water infrastructure development can also be seen in development projects in urban areas. Alor Setar as the main administrative centre also received an allocation of \$3.2 million in 1962 to upgrade the city's water supply system. These funds were used to build larger water treatment plants and improve the pipe network around the city to ensure a consistent supply of water

to the growing town population. This emphasizes how the state government balanced development needs between urban and rural areas, despite the existing imbalance in terms of total allocation.<sup>29</sup> During this period, the issue of inequality in the development of water infrastructure became a topic that was often raised by representatives from rural areas. Huge allocations to projects in big cities such as Alor Setar and Kulim raise concerns that rural areas may continue to be neglected. The debate in the Kedah State Assembly showed that despite efforts to develop infrastructure in rural areas, it had to wait its turn as larger allocations were needed to accommodate the rapid growth in urban areas.

### **Limited Water Resource Management Challenges in Kedah (1960-1964)**

Managing the restricted water supply to meet the demands of the agricultural sector, infrastructure development, and population increase was a significant concern for Kedah between 1960 and 1964. As a state whose primary source of income is rice cultivation, Kedah faces the issue of scarce water supplies, which is frequently brought up in discussions at the State Legislative Assembly. Members of the State Legislative Assembly expressed concerns during a number of debate sessions regarding the inequality in water distribution between urban and rural areas and the absence of proper water infrastructure. The lack of funding to construct water infrastructure that could meet the rising demand was one of the biggest obstacles. This issue was brought up by a Kubang Pasu assemblyman in 1962, who claimed that the funds provided to the Public Works Department (JKR) for the upkeep of the current water supply system were insufficient to meet the needs of the rural population, who frequently struggled with a shortage of clean water. In the same debate, it was stated that the allocation of \$3 million given to JKR that year was not able to cover all the planned water infrastructure projects, including the construction of water storage tanks in remote areas such as Sik and Baling.<sup>30</sup>

Another challenge is the lack of stable natural water sources to ensure continuous water supply. Areas such as Yan and Kulim, which depend on small rivers and artificial dams for irrigation of paddy fields and domestic use, often suffer from water shortages during the dry season. This affects agricultural productivity in the area and also creates tension between the local population and the state government. In a debate in 1963, the Yan assemblyman stated that a consistent lack of water supply had caused a 15% drop in agricultural yields in the Yan and Guar Chempedak areas. This situation emphasizes the urgent need to develop more dams and water treatment plants capable of meeting the needs of agriculture and the local population, but the state government was unable to address this problem comprehensively due to limited financial allocations.<sup>31</sup> In addition, limited water resource management also affects water supply in urban areas. Alor Setar, as the main town in Kedah, was facing the problem of low water pressure and lack of clean water supply due to the rapid increase in domestic demand. In 1964, the Alor Setar assemblyman stated in a debate that the existing water supply system was unable to meet the needs of the city's growing population, and efforts to upgrade the water pipe system and water treatment plant required an additional allocation of \$2.8 million. This proves that the challenge of water management in Kedah is not only focused on rural areas, but also involves the growing cities.<sup>32</sup>

Furthermore, the issue of sustainability in water resource management was also raised in the DUN debate. In 1963, the Kubang Pasu assemblyman suggested that the state government should take more proactive measures in ensuring that water sources are not polluted and are able to meet long-term needs. Although certain measures such as the construction of dams and water treatment plants have been planned, the lack of financial resources prevents the full implementation of the plan, causing the problem of water shortage to continue and negatively impacting economic growth and social well-being in Kedah.<sup>33</sup> In the same aspect, there is the introduction of laws such as Water

Supply Law No. 130 in protecting the interests of water supply sources in the specified period. Water Supply Law No. 130 which was amended in 1961, aims to regulate water resources, protect rivers, and improve the efficiency of water supply management through JKR. This law empowers JKR to maintain rivers and dams, as well as ensure clean water supply to residents in strategic areas.<sup>34</sup>

## Findings

### **Inequality of Water Supply Distribution: Political Influence in Resource Allocation**

This finding shows the inequality of the political power structure in determining the allocation of water supply in Kedah in the 1960s. Through the analysis of the Kedah State Assembly debate, it was found that the distribution of water resources is not a purely technical decision, but is more influenced by political calculations involving the interests of areas with dominant political power. Large water project allocations were made to places like Kulim, an industrial and agricultural centre, and Alor Setar, an administrative centre. Alor Setar and Kulim received \$2.5 million and \$1.6 million, respectively, which is significantly more than what was allotted to rural communities.<sup>35</sup> These results imply that the economic significance of cities is not the sole justification for these substantial expenditures. However, as demonstrated by the political dynamics in the Kedah State Assembly, politicians utilize their influence to make sure that significant funds are distributed to their constituents, which is essential for gaining political support. The distribution of allocations is mostly governed by political power, with priority given to areas judged to be more economically and electorally significant.

However, rural regions like Changlun and Pendang were frequently overlooked when allocating funds. The Pendang assemblyman in 1963 raised the delay in water supply in rural areas, with the actual date of water projects in those areas only expected to be completed after 1965.<sup>36</sup> This illustrates how rural areas, which do not have strong political power, were often marginalized in water resource management. This finding highlights the structural injustice that exists in the water allocation distribution system, areas with less political influence receive much lower allocations even though water resources were their primary need. In the context of Water Politics Theory, this finding confirms that the management of water resources is not a matter of efficiency alone but is influenced by political forces that determine priorities in the distribution of resources. Politicians in Kedah at that time tended to politicize water distribution, making water resources a tool to maintain political power in the areas they represent. Water resources are made political capital, and this contributes to inequalities in water access between urban and rural areas. The more politically strategic areas, especially the urban areas, benefit greatly from the provision, while the more remote rural areas continue to be marginalized. These results help to clarify that systematic inequity in water management, which persists in rural regions, is a result of political power in the Kedah State Assembly.

More significantly, these results imply that the consequences of this unequal water distribution extend beyond technical problems like water shortages and also lead to discontent among rural inhabitants. When rural communities feel excluded by the state administration, this can have broader effects for the political stability of the state. This disparity stems from unequal power dynamics, where the distribution of vital resources, like water, is utilized as a political ploy to bolster the government's influence in key regions, hence extending the gap between urban and rural development. All things considered, these results show how the politics of influence in the Kedah state assembly have resulted in an imbalance in the distribution of water resources, with less influential districts receiving little funding while more politically powerful areas continue to reap the

benefits. The theory of water politics offers a clear framework for comprehending how Kedah's water politics have been politicized to preserve power and influence, with unjust consequences for rural communities that are frequently left out of the administration of this essential resource.

### **Imbalance in Water Infrastructure Development in Kedah (1960-1964)**

The study's second conclusion showed that, between 1960 and 1964, there was a notable disparity in the development of water infrastructure between Kedah's rural and urban districts. Although several large projects such as the Muda Dam and the upgrading of water treatment plants in key areas such as Alor Setar and Kulim has been implemented with large allocations, rural areas such as Sik, Pendang, and Changlun continue to face the problem of lack of adequate water infrastructure.<sup>37</sup> This finding also reflects how unbalanced allocation leads to delays in water supply to areas such as Pendang and Changlun. In the State Legislative Assembly debate, the Pendang Assembly Member raised the issue of insufficient allocation to solve the water supply problem in the area. The proposal to build a small water pump to draw water from Pendang River was rejected by the state government due to lack of funds.<sup>38</sup> The delay in developing infrastructure in this area not only affects domestic water supply but also has a negative impact on agricultural productivity, which is the main economic sector in Kedah.

Through Post-Independence Development Theory, this finding shows that independence led to massive infrastructure development in Kedah. However, it is difficult for the state government to develop rural areas at the same rate as urban areas due to the imbalance in project implementation. Political and economic considerations drive the development of water infrastructure in urban areas like Alor Setar and Kulim, whereas agriculturally dependent rural communities are frequently left out. This highlights how state government decisions about the distribution of resources and the execution of infrastructure projects are influenced by political goals. These results further support the idea that this disparity inhibits economic growth in places without proper water infrastructure in addition to affecting rural inhabitants' access to clean water. Some rural areas have seen a drop in agricultural production due to water scarcity, which has a direct effect on the daily income of those who depend on this industry. These results demonstrate the ongoing disparities in Kedah's water infrastructure development, as rural regions still lagged behind in urbanization and attempts to provide an appropriate supply of water. Weaknesses in the management of allocations and political priorities cause rural areas to face difficulties in obtaining basic infrastructure that is important for the survival of life and economy.

### **Water Resource Constraints and Infrastructure Pressure in Kedah (1960-1964)**

The third finding in this study shows that water resource constraints in Kedah from 1960 to 1964 put great pressure on the existing water infrastructure, especially in areas that depend on irrigation for the agricultural sector. Areas such as Yan and Guar Chempedak, which depend on irrigation systems for paddy fields, face major challenges due to the lack of a stable water supply, especially during the dry season. Dependence on irrigation for rice cultivation caused agricultural yields in the area to decrease by 15% in 1963.<sup>39</sup> This shows that the urgent need to increase the capacity of water treatment plants and improve the irrigation system has not been fully addressed by the state government. The Yan Water Plant and other plants such as the Bukit Pinang Water Plant and the Teroi Water Plant were only able to supply limited water at that time, which contributed to the weakness in maintaining sufficient water supply for the agricultural and domestic sectors.<sup>40</sup>

This scarcity of water supplies can be viewed through the lens of public resource theory as a problem in the management of scarce Public Resources. Despite obstacles including limited funding and inadequate treatment plant capacity, the state administration of Kedah is working to expand its water infrastructure in order to satisfy demand. Particularly during the dry season, when rice fields need more irrigation, the Muda Dam and the constructed irrigation system are unable to continuously supply the water requirement. Furthermore, this research highlights how the scarcity of water in agricultural regions like Yan impacts both public health and economic prosperity. The population is forced to rely on natural water sources like rivers and wells, which are frequently contaminated and can spread illnesses like cholera and dysentery, due to the lack of a reliable water supply. The socioeconomic well-being of the rural population has suffered greatly as a result of the inability to expand the capacity of water treatment facilities and guarantee sufficient water distribution. The scarcity of water resources during the dry season and the rise in overall water demand for both domestic and agricultural usage are the main causes of the water infrastructure pressure in Kedah during this time, according to this report. The state government faces major challenges in providing sufficient water resources, especially in areas that depend on agriculture. This shows that water infrastructure planning needs to focus more on long-term development that can accommodate the increasing water needs in the state.

### **Effectiveness of Legislation in Water Management in Kedah (1960-1964)**

The findings of this study show that the effectiveness of legislation in water management in Kedah, despite having strengthened the role of the Public Works Department (JKR) through the introduction of laws such as the Water Supply Law No. 130, still faces the challenge of imbalance in its implementation.<sup>41</sup> Major urban areas are more likely to benefit from the implementation of this legislation, while rural areas continue to be marginalized in the distribution of resources. Although this law strengthens the water management system, uneven implementation has created problems, especially in rural areas. Areas such as Alor Setar and Kulim, which are economic and administrative centres, receive priority in the allocation of expenditure and the implementation of water infrastructure projects. For example, the Alor Setar Water Supply Plan Stage II received large allocations, which benefited urban areas, but rural areas such as Yan and Pendang experienced a significant lack of allocations for water infrastructure projects. This situation shows how this law favors areas that are considered strategic from a political and economic point of view. According to Public Law Theory, this conclusion highlights that while the law plays a significant role in organizing water management, political power and economic goals continue to influence how water resources are distributed in Kedah. Despite efforts to promote fair and equitable water management, less strategic rural communities are frequently left out while more politically and economically influential places continue to gain. This study indicates that there are still issues with resource allocation and the effectiveness of water management law implementation, particularly in regions that receive less political focus. Rural populations thus continue to depend on untreated natural water sources like wells and rivers, which exacerbates the region's public health issues.

In particular, Water Supply Law No. 130 (amended in 1961) represented the key legal mechanism of the period, empowering JKR to supervise rivers, dams, and water distribution systems. However, the findings show that this legal mechanism was implemented unevenly. Its enforcement tended to favour politically strategic areas such as Alor Setar and Kulim, while less influential rural districts like Pendang and Changlun continued to face delays and neglect. This illustrates the central insight of the study: that legal mechanisms existed but were mediated by political power, producing inequitable access to water resources.

Furthermore, the effectiveness of legislation in Kedah's water management can be seen through the amendment of Water Supply Law No. 130, which was introduced to strengthen the state's water supply system during a critical period of post-colonial development. The amendment coincided with the implementation of the Alor Setar Water Supply Scheme Phase II in 1964, signalling the state government's commitment to provide a stronger legal framework to support modernisation. Kedah was still in an experimental stage of expanding its water supply network, and therefore required a legislative backbone not only to regulate the system but also to protect the state's growing water assets. The amended law outlined several important provisions. It clarified the definition of water supply with specific reference to household usage, established procedures for the collection of water revenues by state engineers with authority vested in the State Council and the Sultan to appoint collection agents, and confirmed that public standpipes installed across Kedah were to be used for household and essential needs of the people. It also detailed the responsibilities of JKR officers, including installation standards, work ethics, and related employment safeguards, and introduced penalties such as a \$100 fine for the misuse of public standpipes. These provisions show that the law was not merely symbolic but aimed at creating administrative efficiency and accountability compared with earlier arrangements. However, while the law provided a comprehensive framework, its enforcement was uneven. Priority was given to urban and economically strategic areas such as Alor Setar and Kulim, where standpipes, water plants, and networks were upgraded under the new law, while rural districts such as Pendang and Changlun experienced delays and limited application of the legislation. This uneven enforcement underscores that the law, while robust on paper, functioned within the political economy of the time, reinforcing disparities in resource allocation. Thus, the amendment of Law No. 130 demonstrates both Kedah's legal commitment to strengthen water supply management and the persistent influence of political power in shaping how the law was applied in practice.<sup>42</sup>

## **Conclusion**

According to this study, political and economic factors had a significant impact on Kedah's water supply management between 1960 and 1964, which resulted in an unequal distribution of water resources between urban and rural areas. According to the debate in the Kedah State Legislative Assembly, key places like Alor Setar and Kulim receive significant funding, but rural communities like Yan, Sik, Pendang, and Changlun are frequently excluded from the execution of water infrastructure projects. In rural places, this imbalance results in a shortage of clean water, which impacts everyday life and agricultural productivity, particularly during the dry season.

This study's primary focus is on how economic interests and political power have led to an imbalance in the distribution of water resources, with infrastructure projects being prioritized in urban areas with greater economic and political clout. Water Political Theory, Environmental Legal Theory, and Post-Independence Development Theory all support this conclusion by demonstrating that political decisions in the management of public resources have an impact on water resource management in addition to physical or technical requirements. The results of this study demonstrate that, despite the introduction of regulations to improve water management through the JKR, the implementation is still uneven. While rural communities remained marginalized in terms of infrastructure execution and resource allocation, urban areas gained more from this legislation. This demonstrates that although laws are thought to be a crucial tool for managing water resources in a methodical manner, unfair application nevertheless happens, mostly as a result of political preferences.

The results of this study are pertinent to the current water problems in Malaysia and offer a significant overview of the ways in which political and economic forces influenced Kedah's water resource management between 1960 and 1964. Malaysian water management is currently dealing with more complicated issues, particularly in guaranteeing consistent access to potable water across the nation. This study provides crucial insights on how water laws and management must be applied more fairly and efficiently in light of the changing global environment, rising water demands brought on by population increase, and the quick development of urban and industrial areas.

Important lessons are also learned from this study for future water law implementation, where more thorough application is required to prevent unequal resource distribution. The state of affairs in Malaysia at the moment demonstrates that ineffectiveness non the application of water policies, particularly in the allocation of funds and the construction of water infrastructure, is a problem that requires significant attention. This study demonstrates that if laws are applied unfairly and with political bias, they are insufficient on their own. Thus, this study is important because it warns policymakers and implementers that any delay or imbalance in the application of water regulations will continue to have an impact on communities' livelihoods, particularly in underserved areas. The study's findings can be applied to Malaysia's current water management situation, where stricter, more open, and equitable water laws should be implemented to guarantee that all societal levels, irrespective of local political or economic interests, have access to steady and adequate clean water. All things considered, this study highlights that equitable and balanced water management depends not only on a robust legislative framework but also on implementation free from political influence. The key to more balanced growth and improved socioeconomic well-being for the people of Kedah state and Malaysia in general is the necessity for equitable and comprehensive water infrastructure development in all areas, irrespective of political or commercial interests.

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### Notes

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