

# Sabah Water Resources Enactment 1998 Dilemma: Purposes, Implementation, and the Consequences

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## Abstract

Sabah Water Resources Enactment (SWRE) 1998 was launched in 1998, to ensure that Sabah's natural water resources are protected and managed in sustainable ways. Sabah accounts for approximately 22.37% of Malaysia's land mass area and has large portions of Malaysia's complex and unique ecological biodiversity. Some of the functions of SWRE 1998 include the provision of recommendations on how to improve and protect the quality and quantity of Sabah's water for domestic and aquatic flora and fauna and advising the Minister on the management and use of Sabah's water resources. Sabah faces water-related issues like non-revenue water (NRW), water pollution, and water shortages. SWRE 1998 strategic effectiveness includes safeguarding against extensive water loss and damage to Sabah's natural water resources while its strategic weakness lies in the lack of stakeholder involvement and awareness. Strategic improvements needed concerning SWRE 1998 include regular review and revision to ensure it is implemented following consistent guidelines and increasing public awareness and education about this institutional framework.

**Keywords:** SWRE 1998, Sabah Water Governance, Water Resource Management, Sustainable Management, Water Resources

## Introduction

Water shortage is a recurring problem in Malaysia, with some of the causes for water crisis in the country including, increased water demand and poor water management. While this study's aims and motivations are multifold, they converge on water scarcity and water management practices in Malaysia, with a particular focus on Sabah, a region recognized for its rich water resources. Through the lens of the Sabah Water Resources Enactment (SWRE) 1998, this study examines water management in the Sabah region. The study provides a legal analysis and interpretation of the study, elucidating any ambiguities and giving insights into the intentions behind the law enactment. Additionally, the study analyzes the effectiveness

of the legal framework, comparing it against the initial intentions and goals behind its enactment. More importantly, the study examines the enactment's impact on environmental protection and social well-being. In terms of environmental protection, the study examines how the legal framework is enhancing sustainable water management, and at the same time raises any concerns on how the enactment may be hindering sustainable water management. On the other hand, the study delves into how the enactment has impacted social well-being by increasing the clean water supply in Sabah.

This study builds on the water management discourse, providing practical knowledge that can be applied in lawmaking. Firstly, the study's discussions have serious implications for policymaking regarding water management. Through the detailed legal interpretation and highlight of the enactment's shortcomings, the study guides policy-making focused on the improvement of the legal framework. The study provides a detailed guide to the strategic changes needed to improve the SWRE enactment. More importantly, it discusses the challenges that may arise during policy changes and implementation. Overall, this study contributes by guiding policy changes and guiding policymakers on navigating challenges in their water management policy-making processes.

Sabah is a developing state in Malaysia known for its richness in water resources (Imm et al., 2021; Sakke et al., 2020; Aloysius et al., 2019; Lee et al., 2018). Worldwide, Malaysia is known as one of the countries rich in water resources (Jafar et al., 2021). As a state in Malaysia, Sabah is a Marine Protected Area (MPA), with its first MPA established in 1974 (Shah et al., 2022). Protected areas in Malaysia were established to conserve terrestrial biodiversity (Wilkinson et al., 2018). This was done to protect Malaysia from a foreseeable water crisis by 2025, despite the country being known for its richness in natural water resources (Rahman, 2021). Due to differing and increasing demands for water in the country, Malaysia gave each of its states the authority to have their own water supply agency, because managing a centralized water resource system was becoming burdensome amid increased demands and challenges (See et al., 2017). The State of Sabah saw the enactment of the Sabah Water Resource Enactment (SWRE) 1998 to ensure that legislation outlined how the state's water resources would be managed.

Sabah accounts for approximately 22.37% of Malaysia's land area (Payus et al., 2020). It has large portions of the country's ecological biodiversity, with several MPAs designed and established across the state (Shah et al., 2022; Payus et al., 2020). Ioki et al (2019) highlight Crocker Range Park as one of the largest protected areas in Sabah. As of 2009 25% of Sabah's land area was covered in intact forest while 31% was severely degraded by human activities like logging, impacting its freshwater systems (Luke et al., 2017). Human activities thus prompted the need to launch a sustainable water resources management plan to protect the state's water resources, which were, and still are, under threat.



*Map of Sabah River Basin Management Unit (RBMU)*

*Retrieved from Official Portal for Department of Irrigation and Drainage (2023)*

<https://water.gov.my/index.php/pages/view/501?mid=246>

The geographical structure of Sabah is a rich mixture of beaches, tropical rainforests, and mountainous regions (Sabah State Government Official Website, 2023). Crocker Range is located at the center of Sabah heartland, and it houses Mount Kinabalu, the highest mountain range in the region, which is also considered the highest mountain in East Asia at 13,435ft above sea level. The longest river in Sabah is the Kinabatangan River which flows from the Crocker Mountain Range to the Sulu Sea and is approximately 560km. Sabah's dense tropical forests, rivers, and other aquatic ecosystems support a wide range of wildlife and aquatic flora and fauna that can only be found in this part of the world.

Information on the Sabah State Government Official Website (2023) highlights several wildlife regions considered important to the state. These include the Danum Valley which spans 438 sq. kilometers of undisturbed land, and which is the natural home for endangered wildlife species like Orang Utan, Sumatran Rhino, and Asian Elephant; the Tabin Wildlife Reserve which houses some of the highly endangered species in Sabah and Malaysia at large, Imbak Canyon, housing one of Sabah's widest, and the most unique, outstanding waterfalls in Malaysia. Imbak Canyon is one of the last remaining areas of Sabah's undisturbed lowland forests. Other areas include the Maliau Basin and the Kabili-Sepilok Forest Reserve. These areas highlight attempts of Sabah's State government to preserve its natural environment, which includes natural water resources within these areas. The state acknowledges that some of its forest land mass has been disturbed, warranting the need to take a more deliberate stand to protect and conserve these areas.

This paper evaluates SWRE 1998, its purpose, implementation, and evaluation, and discusses the strategic effectiveness, weaknesses, evaluation, and consequences of its

implementation while highlighting areas needing strategic improvement concerning SWRE 1998.

### **Purpose of Establishment of the Sabah Water Resource Enactment 1998**

According to the Sabah State Government (1998), SWRE 1998 was established as

*“ to provide for the sustainable management of the water resources of the State of Sabah, so as to promote the orderly, equitable and efficient use of water and to maximise its economic, social and environmental benefits for the future, and for other matters connected therewith and incidental thereto.”*

SWRE 1998 was therefore launched as a legislative strategy by the Sabah State Government as a sustainable water resources management tool. Some of its functions, as outlined in the SWRE 1998 document, included advising the Minister on the management and use of Sabah’s water resources, determining water activity license applications with State or regional significance or interest in a particular area within the State, and the provision of recommendations on how to improve Sabah’s water quality and quantity for domestic, aquatic flora and fauna use, including the aquatic environment.

The State of Sabah is endowed with rich natural resources (Aloysius et al., 2019). It has a pristine environment that matches its beautiful, tropical landscapes. The state’s government recognizes that its water resources, combined with its other natural resources, play vital roles in sustaining its unique biodiversity and other forms of life, forming a crucial backbone for its development (Aloysius et al., 2019; Weng et al., 2017). It understands that water is a finite and vulnerable resource needing proper management to avoid unsustainable practices.

SWRE 1998 was born out of the need to adopt sustainable water resource management practices throughout Malaysia. According to Rahman (2021), the issue of unsustainable water resources management is very critical in Malaysia and its states. The federal and state governments of Malaysia recognize water as an essential aspect of their heritage and thus seek ways to ensure sustainable water resource management in the country. SWRE 1998 was thus launched to strengthen the management of water resources in each Malaysian state, including Sabah (Sukereman et al., 2022). Subsequently, each state in Malaysia has its own water supply agency tasked with managing state water resources and ensuring that water is safe for all consumers – domestic and aquatic flora and fauna (See et al., 2017). While each of these consumer groups plays an integral role in the development of Sabah, human activities constitute the biggest detrimental impact on Sabah’s water resources leading to the deterioration of the state’s water quality and quantity.

Garba et al (2021) argue that deforestation and logging are the major human activities with devastating effects on Sabah’s water resources. Such activities arise from population growth, rapid globalization, industrialization, and the growth of the domestic sector, making management of water resources more challenging and demanding (Aris et al., 2014). Excessive forest cutting and waste dumping have considerably affected Sabah’s water resources like rivers.

On the other hand, Huang et al (2023) posit that droughts have drastically increased in severity and frequency in Sabah since the late 1960s. This is attributed to human activities like excessive logging and climate change. When people over-exert the environment with their activities it has detrimental effects on the environment. Frequent, multiple logging and deforestation negatively affect the environment, contributing to the increased prevalence of droughts. Such affected water availability in the state.

**Implementation Phase of SWRE 1998**

According to Sabah's Deputy Chief Minister Datuk Seri Dr. Jeffery Kitingan, the SWRE 1998 was launched but never implemented (Doksil, 2022; Lee, 2022). It was approved but it was not implemented, hence its implementation phase is still in its initial stages. Portions of SWRE 1998 were however implemented, especially clause 40 (4) which stipulates how river reserves shall be managed. There exists very little published information on Sabah and SWRE 1998, making it quite challenging to determine to what extent the SWRE 1998 was enforced, and its subsequent impact on Sabah's water resources (Payus et al., 2020). What is known and acknowledged by the Sabah government is that SWRE 1998 was launched but not enforced and that specific portions of SWRE 1998 were implemented, especially those concerning river reserves and riparian land in the state.

**Consequences of SWRE 1998**

SWRE 1998 is a type of Integrated Water Resource Management (IWRM) tool. Each state in Malaysia has its IWRM tool tasked with the implementation of sustainable water resources management (Sukereman et al., 2022). Despite the existence of these tools, there still existed various consequences due to not fully implementing legislative tools like SWRE 1998. Sabah needed to manage its water resources to ensure that its consumers had access to clean and safe water (See et al., 2017). This was not entirely the case. There were increased cases of high non-revenue water amid increased demand for water, with many more areas of Sabah exposed to frequent and severe droughts since the late 1960s (Huang et al., 2023; Lai et al., 2020). Had the SWRE 1998 been fully enforced and implemented, there exists the possibility of a lower recurrence of such impacts.

Lai et al (2020) defined non-revenue water (NRW) as the water that is produced and consumed without producing revenue to water management agencies and utilities. It includes water that is lost through theft, leakages, reservoir overflow, and unrecorded water consumption. A lot of water is produced and distributed in Sabah, but the recorded amount paid for water is lower than the amount distributed to various consumers in the state. In most Malaysian states, the NRW rates have ranged from 19 to 60% over the past few decades (Lai et al., 2020). Thus, water availability is delayed because of water loss in various ways like pipe leakages during distribution (Sakke et al., 2020). Such water losses through NRW could have been prevented or minimized had the SWRE 1998 been fully implemented and enforced after its launch in 1998.

While SWRE 1998 was not fully enforced, its clause 40 (4) was implemented and is acknowledged in several published works. According to this clause, rivers in Sabah state that are 3 meters wide, or more are required to provide a minimum of twenty meters of vegetated zone on either riverbank (Imm et al., 2021; Blumroder et al., 2018; Luke et al., 2017; Stark et al., 2017; State Government of Sabah, 1998). Thus, SWRE 1998 forbade land clearing and deforestation in such reserves, which are also called riparian buffers (Imm et al., 2021). The legislation of Sabah requires and mandates that these 20 meters buffers should be maintained on all rivers and streams in the state. Riparian buffers constitute some of the protected areas in Sabah. However, by 2009 31% of Sabah's land area was severely degraded forest due to multiple logging activities, detrimentally impacting its freshwater systems (Luke et al., 2017). Non-enforcement of SWRE 1998 thus led to further deterioration of its water resources due to unsustainable water resource management practices and unregulated human activities.

Other consequences of the non-enforcement of SWRE 1998 include the state's continued issues like neglect of river reserves prior to development activities, no collection of royalties in water resource management, and land acquisition complications (Lee, 2022). River reserves, constituting the riparian buffers, have been perennially neglected, with very few instances in which the twenty meters' buffer should be maintained on all streams and rivers in the state. Land acquisitions, especially those near natural water sources, have increasingly become more complicated, as very few people follow the procedures stipulated in SWRE 1998.

Subsequently, human activities like logging and rapid industrialization have led to extensive deforestation in Sabah, with 31% of Sabah's land area being degraded or severely degraded forest from multiple logging activities (Luke et al., 2017). SWRE 1998 stipulated how activities on water resources and near water resources should be conducted, and the application process for getting a license to conduct such activities. Therefore, non-enforcement of the SWRE 1998 predisposed Sabah's natural water resources to further dangers and ills, limiting the state's ability to collect royalties from water resource management activities like the distribution of treated water.

### **Strategic Effectiveness of SWRE 1998**

Highlighting the strategic effectiveness of SWRE 1998 is pretty challenging because it was not fully enforced after its launch. Due to non-enforcement, it can be assumed that SWRE 1998 was less effective in the sustainable management of Sabah's water resources because it was not conducted according to its stipulated goals, objectives, function, methods, and practical actions (Sukereman et al., 2021). According to the State of Sabah (1998), some of the functions and goals of SWRE 1998 included ensuring public authorities in Sabah act in ways that minimize or prevent harm to water resources, adopt and implement recommendations on approved catchment management plans, determine water activity licenses and adoption and review of plans for the effective and orderly development of water resources in the state/region.

It cannot be said that the achievement of these functions was effective especially when the administration of Sabah state acknowledged that SWRE 1998 was not enforced (Doksil, 2022; Lee, 2022). It was approved, but not enforced. Only a few sections of the tool – section 40 touches on the riparian land and river reserves – have been highlighted in various studies, but it is not quite possible to substantiate how much has been done in the enforcement and implementation of SWRE 1998.

Had SWRE 1998 been implemented, it would have been effective in guarding against extensive water loss and damage to Sabah's water resources. Few logging activities would have been conducted on its land mass, lowering the impact of deforestation and logging in the state. Additionally, the state would have had a higher capacity and mandate to collect royalties from water resource management activities. Collection of royalties would have further enhanced the SWRE 1998 capacity for effectiveness in meeting and managing demands on water resources of Sabah State.

### **Strategic Weakness of SWRE 1998**

A fundamental strategic weakness of SWRE 1998 is in its non-enforcement after it was launched. This posed a regulatory challenge in the implementation of the SWRE 1998 protective policy on water. According to Weng et al (2017), the implementation of SWRE 1998, like other protective policies, was the local responsibility of Sabah State. However, one

strategic weakness that might have contributed to its non-enforcement was the lack of competent staff to oversee and carry out the mandates of SWRE 1998 (Sakke et al., 2020). Competency requires that people know what needs to be done, and have the requisite skills, attitudes, knowledge, and technical know-how to perform what is required of them. They need to have the ability to act on their mandates with efficiency and effectiveness. They need to have the knowledge and information to inform their decisions and actions as stipulated in SWRE 1998.

People do not know how to implement policy decisions, and this requires that they be trained and inducted on how to implement policy decisions later (Weng et al., 2017). Shortages of human capacity and capital for planning and implementation of SWRE 1998 impeded its ability to effect its mandate (Sukereman et al., 2022). Through relevant training activities, people are thus equipped with knowledge of what is expected of them and how to achieve these expectations. They gain insight into the discourse of the policy decisions and align their skills, knowledge, and attitudes with what is required of them to carry out their mandate effectively and efficiently. Thus, lack of awareness accounts for another strategic weakness in the enforcement and implementation of SWRE 1998 (Sakke et al., 2020). The people of Sabah did not know what was expected of them and lacked knowledge of how to implement SWRE 1998.

Additionally, there was ineffective river and water basin resource management (Payus et al., 2020). There existed no active leakage control measures for already existing water distribution resources (Sakke et al., 2020). A lot of water thus was wasted in the form of NRW through leakages during distribution. The increased demand for water due to the growing population further makes the burden of water resource management and distribution more challenging for the SWRE 1998 implementation, raising issues with its ability to effectively enforce river basin and water management. As the population grows, so does the water demand, and the need to be more efficient and effective in ensuring that water resources are well-managed and that people have access to clean and safe water.

### **Strategic Evaluation of SWRE 1998**

Evaluation of SWRE 1998 would be much easier had there been a record of its implementation and progress over the years. Such an evaluation would reveal whether or not the protective policy and legislation of water resource management in Sabah has been effective and efficient in ways that are consistent with the purpose of its launch and implementation. The lack of data on the impacts and consequences of the implementation of SWRE 1998 thus makes it quite challenging to evaluate its progress and performance over the years.

However, if SWRE 1998 had been implemented, data could be compared, and a conclusion obtained from such data. One would look at the land mass area of Sabah covered in intact forest before the launch and implementation of SWRE 1998, and how this land mass area has increased or decreased because of the enforcement of SWRE 1998. One would look at how many more human activities have been reduced over the years concerning logging, land acquisitions, and deforestation and how these activities have changed over the years to favor the rich biodiversity of Sabah. One would also look at the NRW and how the rates have reduced from incredible highs to acceptable ranges, an indication of better water resource management in the State of Sabah.

Additionally, gauging from public discourse, it would be easier to know whether or not the people are aware and informed of SWRE 1998. It would demonstrate that the people

know the SWRE 1998, its provisions, functions, and mandates in the State of Sabah. One fundamental strategic weakness of the implementation of SWRE 1998 lies in the lack of knowledge and information about such a policy decision. People do not know how to implement and enforce policy decisions and cannot thus engage in public discourse about it because they do not know what it is about and what to make of it (Weng et al., 2017). When people are able to talk about SWRE 1998, they share and exchange information and perspectives, helping make a strategic evaluation of its enforcement and implementation.

Often, it is assumed that statutory law such as SWRE 1998 is effectively enforced by the International Sustainability and Carbon Initiative (ISCI) and the Roundtable on Sustainable Palm Oil with RED requirements (RSPO-RED) (Blumroder et al., 2018). However, other evaluations of such indicate that such statutory legislation often focuses on rivers and streams wider than three meters wide, leaving out smaller water channels and creeks. Also left out are artificial water systems because such statutory laws, just like SWRE 1998, do not address such water resources. In this regard, SWRE 1998 can be evaluated and considered ineffective because it does not holistically address sustainable water resource management.

### **Strategic Database and Historical Records for Future References**

There is very little information published on Sabah (Payus et al., 2020). Such indicates that a database on the implementation, monitoring, and evaluation of statutory legislations like SWRE 1998 may not be in existence. This makes it challenging to monitor the progress and effectiveness of SWRE 1998 over the years because there is nothing to refer to as a starting point. It is crucial that a database be developed, and historical records kept on the progress and challenges of such a statutory legislation, its strategic strengths, and weaknesses. Such information can be used for future references to inform decision-making processes on relevant policymaking platforms. It would guide people on what information would be beneficial, what to do away with, and what to maintain over the years.

In later years, people would be able to see, acknowledge, and appreciate steps taken by previous generations to ensure sustainable water resource management. Having a database and historical records concerning SWRE 1998 is vital in helping future generations discover patterns that may have otherwise been missed over the years during its implementation, providing a benchmark upon which to do better and make necessary improvements and adjustments as needed. Change is inevitable, and water resources in Sabah are not static to changes that happen in Sabah state, especially the rapid urbanization, industrialization, and impacts of globalization. Water resources are vital elements in the sustenance of human life and activities, as well as other forms of life within the ecosystem (Weng et al., 2017). Keeping track of historical records and an active database can go a long way in educating future generations and their sustainability efforts in terms of water resource management. Future generations would benefit tremendously from such a rich source of information.

### **Strategic Improvement Needed Concerning SWRE 1998**

A lot needs to be improved concerning the implementation and enforcement of SWRE 1998. Foremost, there is an increased need for the State of Sabah to recognize water as a finite and vulnerable resource (Omar et al., 2023). Efforts in maintaining sustainable water resource management activities should be based on the understanding that water is a finite and vulnerable resource, especially in an era in which human activities like logging, deforestation, and climate change increasingly impact the integrity of the natural state of the



environment and in turn affects the availability of safe water for consumption and for supporting other forms of life in Sabah's unique and complex ecosystem (Weng et al., 2017). It is acknowledged on the Sabah State Government Official Website (2023) that some areas in the state are recognized as protected areas because of the impact of human activities on these areas. The state recognizes that much of its forest land mass has been disturbed by human activities, endangering the natural ecosystem and wildlife species. There is a need for more recognition of water as a critical, yet finite and vulnerable resource in the state hence contributing to the development, enforcement, and effective monitoring of statutory policies and laws like SWRE 1998 in efforts of sustainable water resource management.

Secondly, Sabah State should recognize that effective water governance efforts should employ a bottom-up approach to ensure enhanced efficiency and effectiveness in implementation (Khalid, 2018). A bottom-up approach basically calls for the involvement of all stakeholders in the decision-making process. Stakeholders in Sabah include its residents who hold no public office, who are directly impacted by the government's actions and laws, and who directly and indirectly derive some form of benefit from Sabah's water resources. Human activities are generally conducted by the people, and most of these people were not involved or informed about protective legislation like SWRE 1998. Weng et al (2017) argued that people lack awareness of the discourse of policy decisions like SWRE 1998, which reflects the lack of involvement and participation of all stakeholders in decision-making processes on water governance.

While state governments like Sabah remain responsible for the conservation of water resources at water basins, it is crucial that the state, through the relevant department, improves on its efforts of engaging and involving all stakeholders in decision-making processes on water resource management and governance in the state (Khalid, 2018). This calls for cooperation between governmental agencies and the local community to enhance the enforcement and implementation of SWRE 1998. It also ensures that there is a higher level of commitment to sustainable water resource management in the state as all stakeholders feel equally valued in the process thus lowering resistance to the implementation of such a policy among the lower-level stakeholders who have the highest impact on the effectiveness and efficiency of statutory legislations like SWRE 1998. By involving the people, the gap between policy intention and policy outcomes is reduced.

Through cooperation, public awareness of SWRE 1998 is raised, and many lower stakeholders are educated and informed on the importance of protecting, preserving, and maintaining the environment (Garba et al., 2021). The implication for this enhanced awareness at the strategic level is that it will see many more people committing to deliberately protecting the rich and unique ecosystem of Sabah because they know how their activities impact their daily lives. They will understand how human activities like logging threaten their future ability to access safe water for consumption, and their beautiful and unique natural environment. Increased awareness ensures that people do not blindly engage in activities that threaten their future survival but encourages them to be more protective to minimize and eliminate adverse impacts on the environment and natural resources that they depend on for their daily survival and living.

Thirdly, there is a need to improve on the review and monitoring process pertaining to the implementation of SWRE 1998. As discussed in an earlier section, the scant information on SWRE 1998 points to the non-enforcement of the legislation since it was launched in 1998 (Doksil, 2022; Lee, 2022). If regular review and monitoring had been performed from 1998 to date, a lot of information on Sabah's enforcement of SWRE 1998 would be available, including

a database and historical records that would provide lessons and mistakes in its enforcement and implementation. Issues would have been identified and handled early enough, and the SWRE 1998 would have undergone changes to make it more effective and efficient in its quest for sustainable water resource management.

Regular review and monitoring ensure that the implementation of SWRE 1998 follows consistent guidelines and works as stipulated in the statutory policy document and decisions (Garba et al., 2021). It would help policymakers understand Sabah's water resources and their surroundings better. It would reveal information that would significantly help in understanding how SWRE 1998 contributes to the achievement of better quality and quantity of water for consumption and production purposes in the state. This information is crucial and beneficial in informing future decisions and policymaking processes to ensure that only what works is implemented and that water resources are managed in a better and more sustainable way that does not threaten the survival of future generations. Increased review and monitoring of SWRE 1998 could significantly impact the ability of the Sabah State Government to generate records that could be used to create a database. Such information and historical records play a significant role in future references as the future generation would be able to build on what had already been done and achieved to do better in their water resource management activities.

### **Issues Affecting Sabah's State Water Governance Sustainability**

Several issues affect Sabah's water governance sustainability efforts. One of the fundamental issues concerns stakeholder involvement and engagement. Based on the scanty information on SWRE 1998 in Sabah, it is evident that there was little to no stakeholder involvement and engagement following the launch of SWRE 1998. Had the government of Sabah effectively engaged all stakeholders, SWRE 1998 would have possibly been enforced efficiently and effectively, providing a wide range of information on the impact of its enforcement and implementation, and highlighting strategic weaknesses and strengths of SWRE 1998. By involving stakeholders, resistance to implementation of such statutory laws is minimized, hence reducing the gap between policy intention and the actual policy outcome after implementation (Garba et al., 2021). Stakeholder involvement increases awareness and embracing sustainable water resource management and governance as the people know what is expected of them and how to go about implementing such policy decisions.

When people and other stakeholders are not involved, the implementation of SWRE 1998 will not be well-received because the people lack awareness and have no exposure to its benefits (Ayob & Rahmat, 2017). This is very challenging in the present and in the future because it implies that people are not exposed to SWRE 1998, they do not know about it and what it is about nor how they stand to benefit from it. When the public is made aware, they are educated on the importance of protecting, preserving, and maintaining water resources to avoid any possible resistance and water-related issues (Garba et al., 2021). SWRE 1998 is designed to protect the natural water resources of Sabah, along with the aquatic environment and the quality and quantity of water (SEARPP, 2018). If the people who are directly impacted and affected by these resources are not involved and engaged in institutional frameworks and statutory legislations like SWRE 1998, it increases the likelihood of resistance to its implementation.

Another issue affecting Sabah's water governance and sustainability concerns key water-related issues. According to Weng et al (2017), key water-related issues in Sabah include increased river pollution and sedimentation, lack of enforcement capacity, water

shortages, increased demand for water, and lack of integrated institutional frameworks for water and land development. Due to rapid population growth, there has been increased demand for water resources in Sabah (Ayob & Rahmat, 2017; Weng et al., 2017). This increased demand for safe and clean water for human consumption puts additional pressure on an already burdened water resource management system that is struggling to deal with issues like NRW. NRW limits the amount of revenue that can be collected from water management activities (Lai et al., 2020). Water resource management is a complex process, and when issues like NRW have to be handled, limited available resources have to be divided, restricting the effectiveness of the entire activity.

Additionally, there is a lack of proper integration of institutional and statutory frameworks and legislation on water and land management in Sabah (Weng et al., 2017). Due to poor integration, there exists a higher probability of clashing interests and priorities, inhibiting the ability and capacity to enforce and implement SWRE 1998 fully. In the future, different teams assigned the responsibility of water and land resource management may frequently clash with each other because of differing mandates and responsibilities. This would make it ineffective and inefficient to implement SWRE 1998 when there exist other institutional frameworks whose implementation conflicts with the provisions of SWRE 1998.

### **Effective Way for SWRE 1998 Implementation**

The most effective way of implementing SWRE 1998 would begin with evaluating the reasons behind its non-enforcement. Such information will be relevant in determining what resources are needed to enforce and implement it fully. However, since scanty information exists on the same, an effective way for SWRE 1998 implementation should begin with public awareness and stakeholder engagement and involvement from the start. When the public is informed and stakeholders are involved, it makes the implementation easier and more effective. Involving the people helps reduce the gap between the intentions behind the enforcement of SWRE 1998 and the desired intended outcomes of this statutory legislation.

Additionally, evaluating the performance of SWRE 1998 implementation should be regularly done to monitor its progress over different implementation phases (Sukureman et al., 2021). Regularly reviewing and reviewing the implementation of SWRE 1998 ensures that the people responsible for enforcing it are doing it following consistent guidelines as stipulated in the document (Garba et al., 2021). Feedback from these reviews would go a long way in helping inform us what needs to be revised and where more efforts should be dedicated to enhancing the effectiveness and efficiency of SWRE 1998's implementation.

Lastly, keeping a database of records of the progress of the implementation of SWRE 1998 is vital for future reference. It would be easier to look back on what has been done, based on available documentation and records kept in a database, and this would provide essential insight into what needs to be changed over the years, and what to retain. Future generations would be able to learn from the past based on the accumulated records from the time SWRE 1998 was implemented.

### **Other Relevant Factors**

As earlier discussed in this paper, it should be noted that Sabah State is richly endowed with natural water resources which are vital elements in the sustenance of human life and activities as well as other forms of life in its complex and diverse ecosystem (Aloysius et al., 2019; Weng et al., 2017). According to the Sabah Government's Official Website (2023), its natural resources, including water resources, play a vital role in the state's economy. These

natural resources are assets that form a crucial backbone for Sabah's development (Aloysius et al., 2019). These resources must be effectively and efficiently managed to ensure that sustainability is guaranteed for present and future generations.

Sabah enjoys wider legislative powers over its water management and regulation activities and policies (Ideres et al., 2023). Thus, Sabah has implemented various legislative and institutional measures aimed at effectively managing the state's natural resources and environment (Sirat et al., 2023). Its jurisdiction over water includes water supply, distribution, and production of waterpower and electricity that the relevant state agencies generate from waterpower (Ideres et al., 2023). Thus, it is important that the various legislations passed and launched like SWRE 1998, Sabah Forest Enactment 1960, Sabah Environment Protection Enactment 2002, and Sabah Land Ordinance Cap 68 be synchronized and integrated for implementation in ways that are effective and efficient (SEARPP, 2018; Ayob & Rahmat, 2017). It is crucial that these factors are considered before the implementation of SWRE 1998 to enhance its effectiveness and efficiency upon implementation.

### **Conclusion**

Sabah State of Malaysia boasts of being richly endowed with natural resources, including water resources that house its diverse, complex, and unique aquatic ecosystem (Sirat et al., 2023; Sukereman et al., 2022; Imm et al., 2021; Aloysius et al., 2019; Weng et al., 2017). To protect these resources, Sabah State launched various legislative measures, including statutory laws like SWRE 1998 to promote sustainable practices and preserve its rich biodiversity (Sirat et al., 2023). According to the State Government of Sabah (1998), SWRE 1998 was launched to spearhead the sustainable management of Sabah's water resources to promote orderly, equitable, and efficient water use hence maximizing its environmental, social, and economic benefits for the current and future generations.

Despite evidence and consequences of non-enforcement of SWRE 1998 (Doksil, 2022; Lee, 2022), it promises great benefits for the people and state of Sabah if it is effectively and efficiently implemented. Its progress should be closely monitored at each implementation phase, and a database of these records kept well for future reference. Strategic weaknesses in the implementation of SWRE 1998 include a lack of public awareness, incompetent staff, and unsystematic implementation and maintenance of its water supply systems. When proper records are kept, dealing with such weaknesses becomes easier, leading to the strategic effectiveness of the SWRE 1998 implementation. Strategic improvements should focus on public awareness, stakeholder involvement and engagement, and regular monitoring and review to ensure consistent works and guidelines are followed in its implementation.

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