



ISSN: 2523-5664 (Print)  
ISSN: 2523-5672 (Online)  
CODEN: WCMABD

# Water Conservation & Management (WCM)

DOI: <http://doi.org/10.26480/wcm.04.2025.726.733>



## RESEARCH ARTICLE

# WATER GOVERNANCE GAPS IN THAILAND: ANALYZING THE WATER RESOURCES ACT (2018) FOR SUSTAINABLE MANAGEMENT

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## ABSTRACT

### Article History:

Received 11 September 2025  
Revised 21 October 2025  
Accepted 17 November 2025  
Available online 10 December 2025

Water is a critical resource for human life, agriculture, and industry, yet Thailand continues to face recurring challenges such as floods, droughts, and water pollution, which highlight the urgent need for an integrated and sustainable water management system. This study aims to examine water management, the central legal framework governing water allocation, utilization, development, maintenance, restoration, conservation, and water rights (Water Resources Act, B.E. 2561. 2018). The research also seeks to identify gaps in the current legal measures and propose guidelines for sustainable water resource management in Thailand. The research used a documentary methodology, which involved a systematic analysis of key legal instruments, government strategic plans, and relevant academic literature on water resource governance and policy implementation. Despite the Water Resources Act introducing crucial mechanisms, such as water licensing systems, usage fees, and avenues for public engagement through water user organizations, the study found that significant operational challenges persist. These issues specifically include the ambiguous roles and overlapping responsibilities among governmental agencies, a strong tendency toward centralized decision-making, and insufficient economic incentives to encourage efficient water consumption. The findings underscore the critical need to embed strong governance principles and ensure genuine community involvement to enhance both the legal effectiveness and the long-term sustainability of the sector. For Thailand to achieve enduring water security, the immediate focus must be on fortifying existing legal frameworks, accelerating the enactment of essential secondary legislation, and cultivating participatory governance. Ultimately, raising public awareness of the actual value of water and instituting market-based incentives for responsible use are vital steps toward sustainable water resource management.

## KEYWORDS

Water management, Water Resources Act, governance, sustainability, Thailand

## 1. INTRODUCTION

Water is an indispensable resource, crucial for sustenance, agriculture, industrial operations, and broader economic growth, encompassing atmospheric precipitation, surface flows, and groundwater reserves. As a natural resource, its quantity cannot be artificially generated or diminished to accommodate human needs (Pramote Maiklad, 2014). The country routinely faces periods of drought, which drastically reduce waterway volumes, hindering the equitable distribution of water to meet consumption requirements. Conversely, sustained rainfall leads to severe flooding, causing extensive damage to property and communities (Manoon Manukhajorn et al., 2019). Furthermore, wastewater and pollution resulting from human activities contribute to persistent water crises. Thailand is thus burdened by recurring water security challenges—severe droughts, seasonal floods, and pervasive pollution—which profoundly affect livelihoods, farming, and fiscal stability. Given this context, achieving materially qualitative and quantitative water management across both the short and long term necessitates the active participation of government bodies, the private sector, and local drainage basin communities in refining and improving management protocols to

align with contemporary water use dynamics. Historically, however, Thai water governance has been hampered by key deficiencies, including fragmented policies and practices, insufficient data for strategic planning and decision-making, and a notable absence of unified legal frameworks, master plans, and dedicated overarching organizations. These factors represent major systemic obstacles that have consistently prevented Thailand from effectively managing water resources before, during, and after disaster events, leading to perennial management failures (National Council for Economic and Social Advisory, 2004).

Throughout the years, the prevailing water resource situation in Thailand has been defined by pervasive water scarcity for human activities, floods causing damage to settlements and agricultural land, and escalating wastewater issues. Water resource challenges are encountered uniformly across all regions of the country. In the North, certain areas experience shortages while others face seasonal flooding, often exacerbated by the degradation of watershed forests (National Disaster Warning Center, 2015). The Northeast is chronically plagued by acute water deficits during the dry season and periodic dry spells even during the wet season. Simultaneously, monsoon and storm activity regularly trigger flooding

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DOI:  
10.26480/wcm.04.2025.726.733

along riparian zones in multiple river basins (Drought Information System site, 2009). The Central Region faces immense water demand, particularly for farming during the dry months. During the rainy season, flooding is a persistent issue within the Chao Phraya River basin, affecting numerous provinces, including Bangkok and the lower reaches of the Chao Phraya, Tha Chin, and Mae Klong rivers.

Furthermore, the issue of wastewater is intensifying annually (Chuchok Ayupong, 2012). The Eastern Region's primary concern is water shortages in rapidly developing coastal settlements and industrial zones. In the Southern Region, localized shortages are observed alongside water quality degradation stemming from acid soils and saltwater intrusion. Another critical issue in the South is the frequent occurrence of flash floods, often driven by intense rainfall and significant deforestation in watershed areas. These problems collectively impose severe constraints on local activities (Pramote Maiklad, 2014; Eastern Province Group Strategic Management System, 2021).

Beyond the localized problems detailed above, a fundamental root cause undermining effective water management in Thailand is the over-reliance on a top-down structural analysis and management approach. This structure predominantly prioritizes adherence to the policies and directives of central government agencies and authorities. Projects—such as the construction of major dams, reservoirs, and irrigation networks—have historically been implemented based on the assumption that they would resolve public problems. Critically, these actions often proceed without prior study or analysis of local community needs and fail to adequately promote public participation in the water resource planning process, as proper governance dictates (National Water Resources Office, 2019).

To solve such problems, an effective water management is essential. According to the royal remark given by H.M. King Bhumibol Adulyadej, he said "Previously, I mentioned a problem that in a little while Thailand will be probably dry with no water remained and will need to buy water from overseas. However, I believe that it will not be like that. Considering the water circulating in Thailand, the water still remains, but it needs to be well managed. If so, it will be superfluous". Such royal remark has led to the development of guidelines on systematic water management. The Water Resources Act, B.E. 2561, 2018 and Master Plan on Water Resources Management for 20 Years (2018 – 2037) were promulgated with a provision on systematic water management of Thailand under the vision 'sufficient water for consumption in all villages, water for stability in production, decreased damages from floods, water quality meeting the standards, sustainable water management under the balanced development with participation of all sectors of the society, consistent with the provision set out in Section 57 of the Constitution of the Kingdom of Thailand, B.E. 2560 2017 (National Water Resources Office., 2018).

However, despite the enactment, significant gaps remain in its implementation, including delays in issuing secondary legislation, overlapping responsibilities among agencies, and limited mechanisms for public participation (Water Resources Act, B.E. 2561 2018). These gaps hinder the effectiveness of integrated water governance and sustainable resource management.

These challenges are directly related to Sustainable Development Goal 6 (Clean Water and Sanitation) and other SDGs that emphasize integrated water resources management, equitable access, and sustainable use of natural resources. Addressing these issues is crucial for achieving Thailand's long-term water security and resilience. This research is significant because it provides evidence-based recommendations to strengthen legal frameworks, enhance participatory governance, and align national water policies with global sustainability targets.

Accordingly, this research aims to investigate water management, analyze existing problems and legal gaps, and propose guidelines for sustainable water resource management in Thailand (Water Resources Act, B.E. 2561 2018). The study seeks to provide policy recommendations that align with SDG targets and strengthen legal frameworks for effective and participatory water governance.

## 2. THEORETICAL FRAMEWORK

The researcher investigated various interesting concepts on water management that are useful to this research. They can be presented in the following points.

### 2.1 Definitions and Components of Water Management

'Water management' refers to the systematic execution of single or multiple actions designed to address critical water issues, such as scarcity,

flooding, and wastewater contamination. Effective water management requires alignment with other related resources within a specific watershed, including both soil and human capital (World Bank Water, 2017).

The process typically involves four primary activities (Institute of Water Resources and Agriculture, 2016):

- **Water Source Development:** Focusing on enhancing the water supply to meet demands within the capacity of the existing resources, coupled with meticulous planning to ensure maximum benefit and long-term water availability.
- **Allocation and Consumption:** Establishing efficient systems and protocols for the distribution and utilization of water across each watershed.
- **Resource Conservation:** Protecting water sources, particularly in upstream areas, through the preservation of forest ecosystems and natural water bodies.
- **Quality Control:** Implementing measures to monitor and regulate the quality of water.

Besides, the study pointed out that guidelines on development and conservation of water resources may be implemented by applying policies and measures set out with a clear direction and goal, setting measures for conserving and developing other natural resources, such as forest, land, etc., to contribute developing effective water management, and issuing rules and laws to control the use of water resources for promoting efficient use of water and preventing pollutions in water sources and environment (Center for Agriculture and Cooperative Information, 2018).

### 2.2 Objectives of Water Management

The central objective of water resources management is the timely and long-term resolution of critical water crises, including scarcity, flooding, and quality degradation (Department of Water Resources, 2019). These efforts are aimed at fostering thriving societies (encompassing human, animal, and plant life), promoting biodiversity, driving effective economic development, and ensuring comprehensive, sustainable access to water for consumption.

Crucially, this management framework mandates integration with the governance of other related resources, emphasizing the minimization of environmental impact while simultaneously maximizing socioeconomic benefits.

Under Thailand's national vision, the goal is to secure sufficient, quality water by 2025. This is to be achieved through a robust organizational and legal structure that promotes equitable and sustainable water use, factoring in the quality of life and the active participation of stakeholders at all levels (Phongsatorn Sophaphan et al., 2004).

### 2.3 Key Principles of Water Management

Effective water management is generally based on five core principles:

- **Water Source Development:** This principle focuses on ensuring an adequate water supply for consumption, aligning with the carrying capacity of water resources, and implementing systematic planning to achieve the highest possible benefits and sustainable, long-term water availability.
- **Effective Water Allocation:** To realize practical and efficient distribution, it is necessary to establish allocation systems and operational procedures specifically tailored to the characteristics of each watershed.
- **Watershed Resource Conservation:** A watershed naturally comprises headwater (upstream), midstream, and downstream areas. Particular attention must be paid to conserving forest ecosystems in upstream areas. Natural water bodies often suffer from silting and excessive weed growth, hindering improvements in water quality. Therefore, cooperation from the public is essential for the effective conservation and maintenance of these sources.
- **Flood Mitigation:** This is a critically important mission, as Thailand is situated in the tropical zone and typically receives heavy rainfall between August and October, especially in the Northern regions.
- **Water Quality Control:** Water quality currently poses a significant national challenge, with numerous small and large communities, as well as agricultural zones, actively addressing wastewater issues.

Furthermore, water development and management efforts should strictly adhere to the approach of Sustainable Development. This ensures that development is conducted in consistency with the principles of moderation and promotes a balance between the protection and the utilization of natural resources (Deunden Nikomborirak, 2016).

#### 2.4 Communities Participation in Water Resources Management

Public participation as defined by the United Nations covers the circumstances where people take parts in interests arisen from development projects, people contribute to complying with development projects, and people play a part in making decisions throughout the process of development. (Fonaroft, 1966) suggested a concept about three forms of participation that are generally executed: public information, public consultation, and public meeting. A public meeting can be carried out as 1) community-level meeting, 2) academic discussion meeting and 3) public hearing, decision-making participation, and legal measures application.

According to such concept, participation of interested parties of all groups in the area is taken into account when it comes to the process of water management since the interested parties in the area are directly affected by problems arisen in the area. The participation of communities and interested parties can help reduce problems, obstacles, and conflicts of the water resources management in the area that would potentially occur in the future. The researcher applied this concept as a basic idea for development of water management in Thailand in this research.

#### 2.5 Application of 5 Governance Principles as Base in Water Management

United Nation Development Programs: UNDP have given high precedence to water resources and has motivated every country in the world to be aware of the importance of water in development of their countries and water crises in order generate sustainable development for human's lives (UNDP, 2021). Cooperated by SIWI and UNDP (The Stockholm International Water Institute, the programs have received supports underdeveloped countries in solving water crises to strengthen their water management under the principle of good governance.

Water Governance means water management by all sectors of interested parties with focus on applying governance principles in the water management. The governance principles include legitimacy, transparency, accountability, participation, efficiency, and effectiveness. Applying governance system for developing an effective water management plays an important role in generating harmony in society, equality among people in society, environmental sustainability, sufficient water for consumption and health, and a promotion for water management. Interested parties to take parts include government sectors, private sectors, and public sectors. After having a good management system, every organization is required to review the management and develop all forms of work to be water management innovations.

The concept on water management with application of governance principles is a good approach for water management. The management process is based on righteousness and focused on participation of all sectors in the society for brainstorming ideas. Organizational culture, individual culture, and group culture should be adjusted for effective, righteous, and mechanically organized management. Also, it relies on communication, collaboration, mutual responsibility for solving problems and developing water management among all sectors in the society for a good and sustainable water management corresponding to the people's ways of living while maintaining ecosystem balance. Governance is, therefore, an important factor that leads to an integrated water resources management for the country.

Regarding the concept of water management mentioned above, it is obvious that an effective water management depends upon a systematic collaboration. In addition, management on other natural resources relevant to water resources need to be taken into account, such as soil, forest, and human.

According to the mentioned above, it can be concluded that the important principles for water management are as follows: setting goals of the water management for generating ultimate benefits and mitigating the water shortage and flood problems, developing the water sources for sufficient availability, allocating water effectively, conserving and maintaining water sources for sustainable use, solving problems when a flood or natural disaster is occurred, and maintaining the good quality of water. All these activities must be managed with a collaboration of relevant government agencies and the people to form a participation, establish good values on water sources conservation and water management, and promote a wise

use of water for the utmost benefits.

### 3. METHODS

This study utilizes a documentary research approach as its core methodology. The data analysis involved examining a comprehensive range of sources: primary materials, such as strategic plans, national development blueprints, the Constitution, and existing legislation; and secondary materials, including textbooks, research reports, academic articles, and dissertations relevant to the subject matter and available in electronic formats. These documents were systematically analyzed to formulate the concluding recommendations.

### 4. RESULTS

#### 4.1 General Conditions, Situations, Problems on Water Resources in Thailand

##### 4.1.1. General conditions and situations on water resources in Thailand

The researcher has studied general conditions and current situations on water resources in Thailand and found that Thailand has diverse water resources including precipitation, surface water, and ground water. Regarding precipitation or rain, Thailand has major 22 watersheds as sources of precipitation, covering an approximate area of 515,934 square kilometers or around 322 million Rai (National Water Resources Office, 2021). Thailand receives substantial annual rainfall, averaging 1,455 millimeters, though this varies widely across regions, from 900 to 4,000 millimeters per year. The country's surface water, derived from precipitation, after accounting for infiltration and evaporation losses, totals approximately 285,227 million cubic meters (m<sup>3</sup>) nationwide. This volume includes an estimated 224,024 million m<sup>3</sup> of runoff available for utilization, representing roughly 79 percent of the total surface water available. The watersheds generating the highest volume of surface water runoff are the Mekong (in the Northeast), the Southeast Coast, and the Mae Klong basins, in descending order (Institute of Water Resources and Agriculture, 2016).

Furthermore, Thailand is underlain by 27 distinct groundwater basins with a massive total storage capacity of approximately 1.13 trillion m<sup>3</sup>. From this reserve, the country can sustainably extract up to 45,385 million m<sup>3</sup> per year without depleting available groundwater resources (Department of Groundwater Resources, 2017).

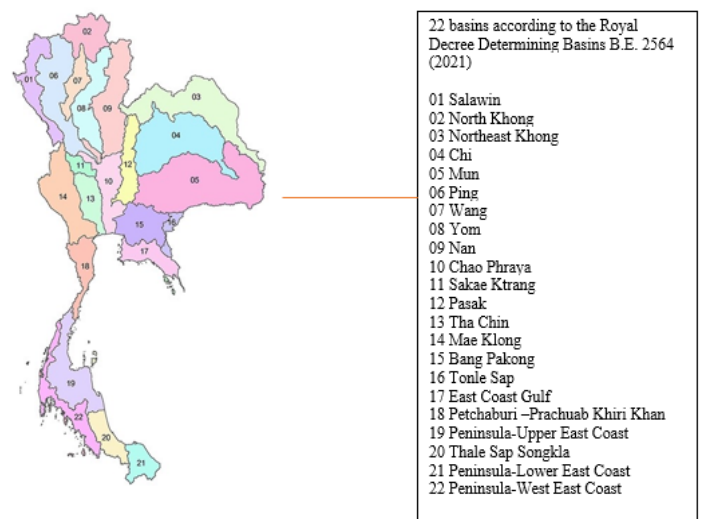


Figure 1: 22 Basins of Thailand

#### 4.2 Problems and Challenges on Water Resources of Thailand

Although Thailand has abundant water resources as mentioned previously, it is still facing with challenges in many aspects such as the increased population density, the increasing demand on use of water in the agricultural sector, use of water for consumption and tourism, use of water for industrial activities, as well as drought and flood problems and environmental deterioration that cause damages to people's lives, properties, and economy of the country.

According to Land Development Department, the data shows that during the past 40 years Thailand has encountered flood many times. Agricultural

and industrial sectors have been damaged, causing losses of income to farmers and greatly damaging economy of the country. Also, there have been droughts as well. In 1979, 1994, and 1999 there were severe droughts occurred almost all over the country, resulting in shortage of water for consumption. In 2017, it was found that Thailand still had 256 villages that are not supplied with tap water and 20,034 villages that had defective and ineffective water supply systems. Furthermore, Thailand has encountered flood for 13 times in almost every province in different years. In such number, there have been 8 severe floods in the Chao Phraya River watershed: in 1975, 1983, 1995, 2002, 2005, 2006, 2010, and 2011. These floods caused damages to lives and properties, as well as the economy of the country with value of damage up to 1.44 trillion baht (Department of Land Development, 2013).

Thailand has more than 40 government agencies relevant to the water resources management, making projects implementation and budget spending be decentralized and disrupted. The management has not been united in both policy and practice levels. There has been a lack of information for planning, decision making, and commanding. Also, Thailand does not have laws, master plans, and organizations that govern the overall water management system, making it unable to manage water both before, during, and after the occurrence of the disasters effectively (Department of Water Resources, 2019).

### 4.3 Current Structure and Process of Water Resources Management of Thailand

Currently, Thailand's water management portfolio falls under the Department of Water Resources. This department is tasked with national water governance, operating within the strategic and operational parameters defined by the 20-Year Master Plan on Water Resources Management (2018–2037). The overarching 20-Year National Strategy (2018–2037) integrates the fifth strategy, which centers on eco-friendly growth and enhanced quality of life. This segment explicitly adopts the late King's Sufficiency Economy Philosophy, emphasizing the core tenets of "Sufficiency, Reasonability, and Immunity" to guide strategic development. The fundamental concept underpinning this strategy is the pursuit of holistic sustainable development, encompassing social, economic, environmental, and good governance outcomes. Implementing this growth strategy relies on the belief in balanced progress across the economy, environment, and quality of life, prioritizing equilibrium among these three facets to ensure long-term, sustainable growth for future generations.

Regarding the National Strategy's specific focus on the conservation and restoration of rivers, canals, and nationwide water sources, planning is predicated on maintaining ecosystem equilibrium, fostering stakeholder participation in managing these natural water bodies, and actively promoting knowledge and mutual understanding among public and private entities. This also includes raising awareness concerning the value and critical importance of water resources. The 20-Year Master Plan on Water Resources Management (2018–2037) serves as the official framework and guiding document for the nation's water sector, with clearly defined objectives and indicators aligned with the National Strategy. The Master Plan's goals are to ensure water availability for both domestic and productive uses, minimize flood-related damage, guarantee water quality standards are met, and establish sustainable water governance rooted in balanced development principles and multi-sectoral participation.

To achieve these aforementioned goals, the Master Plan outlines a detailed implementation strategy structured around six key aspects:

- **Domestic Water Security:** Managing the water supply to adequately cover urban centers, rural communities, special economic zones, and tourist destinations.
- **Productive Water Security:** Establishing water security for the manufacturing sector, controlling water demand, boosting water use efficiency, and budgeting water supplies to support economic growth.
- **Flood Risk Mitigation:** Implementing solutions to address and minimize damages caused by flooding, mudflows, and flash floods.
- **Water Quality Management:** Enhancing the effectiveness of wastewater treatment systems, regulating saltwater intrusion in estuaries, and actively conserving public water sources.
- **Ecosystem Restoration:** Conserving and restoring degraded watershed forests and implementing preventative measures against soil erosion and landslides.

- **Institutional Development:** Establishing robust legal frameworks, necessary water management organizations, comprehensive master plan execution, data management systems, effective follow-up and evaluation procedures, public relations, and participatory mechanisms.

In the recent past, Thailand has faced with many problems on water resources management. Although there have been relevant agencies assigned with duties and authorities under the laws to deal with such problems, including the Nation Water Resource Committee appointed by the government to work on water resources management integrally and systematically in all dimensions, it is still necessary to have laws to support the works for allocation, use, development, management, maintenance, restoration, conservation and rights in water in order to enable the relevant agencies to work integrally and harmoniously with one another in all dimensions with balance and sustainability. Also, the government should set out rules for assuring the fundamental rights of people in accessing public water resources and provide water resources management organization in the national level, watershed level, and organizational level to promote the participation of people for an effective and efficient water resources management.

The fundamentally aims to integrate and unify all aspects concerning water including allocation, utilization, development, governance, conservation, and water rights (Water Resources Act B.E. 2561, 2018). Notably, existing water rights established under other legislation remain valid, provided they do not conflict with this Act. A key feature of the Act is the authorization for individuals residing in the same vicinity and watershed to collectively establish a Water User Organization (WUO) through a legal registration process. These WUOs are intended to serve their members' common interests regarding the use, development, management, maintenance, and conservation of local water resources. The specific duties and mandates delegated to different WUOs are designed to be flexible, varying according to hydrological and geographical realities, local ecosystems, cultures, traditions, and the community's water-use lifestyle. Furthermore, the Act explicitly lays out guidelines for water allocation, demanding adherence to the official priority order established in the (Notice of the Water Resource Committee B.E. 2564, 2021). This hierarchy prioritizes uses in the following descending order: consumption, ecosystem maintenance, disaster mitigation, traditional and customary uses, transportation, agriculture, industry, commerce, and tourism.

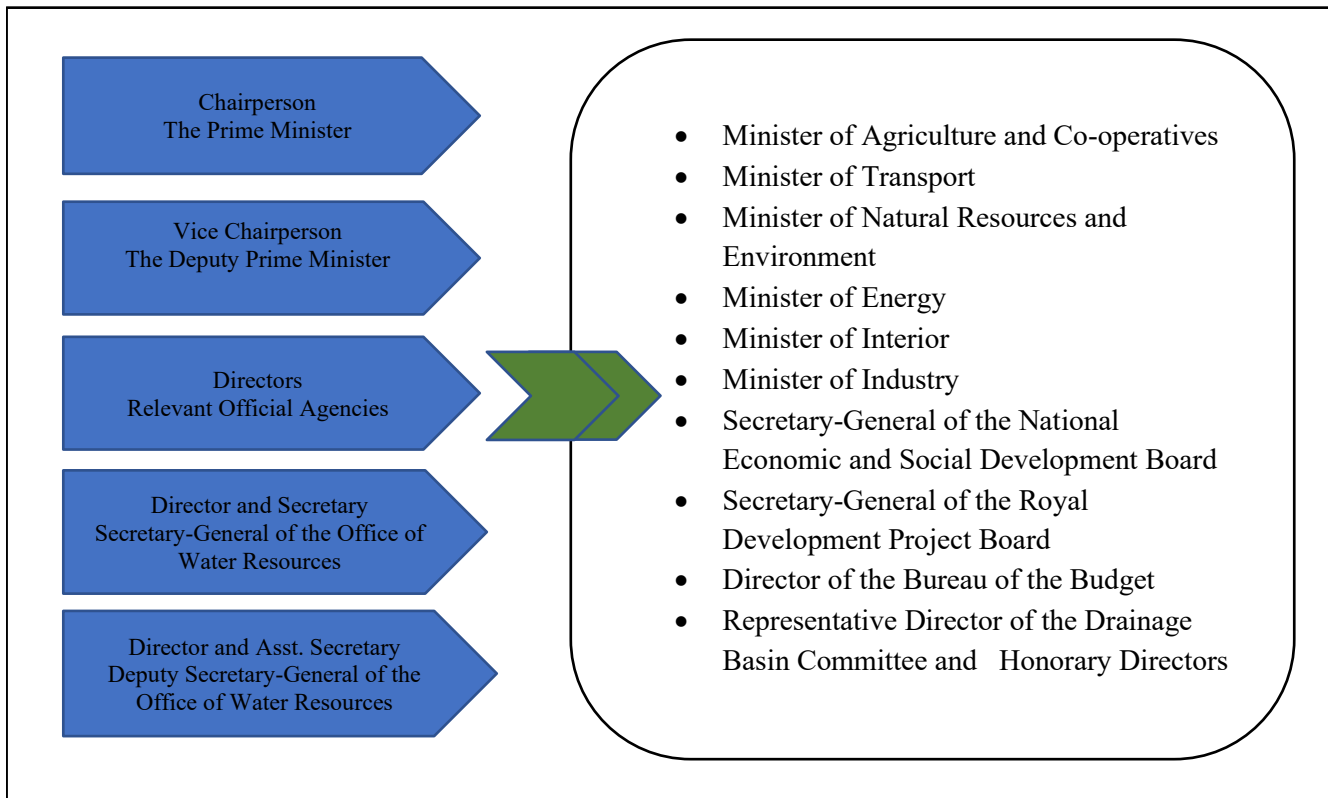
Beyond allocation, the Act details various types of water use, outlines operational methods, and establishes corresponding rates for water-use licenses and public water resource charges based on the nature of the activity. Crucially, specific essential uses are exempt from both licensing and fee payment requirements. These exemptions cover the regular use of public water resources for domestic living, household consumption, subsistence agriculture or livestock farming, household industry, ecosystem conservation, and customary practices. Notably, the Act also mandates the creation of a Water Chart: a definitive map or diagram illustrating the entire network of waterways from their upstream sources to their outflow points (such as seas or international waters). Once officially declared in the Government Gazette, this Water Chart becomes legally binding. Its enforcement is critical to preventing land-use activities within the mapped waterway system that could result in deviations or obstructions to water flow, thereby undermining national plans for effective drought and flood prevention and resolution.

One of the Act's primary objectives is to deter misconduct and to institute legal measures to resolve issues that damage public water resources. Recognizing that damage to public water resources is equivalent to damage to the State, the law imposes significant civil liability on responsible parties. Specifically, any individual who wilfully or negligently causes unlawful damage to public water resources or utilizes them without legal authority is deemed to have committed a wrongful act and is legally bound to compensate the State. Moreover, suppose the damage stems from an object or substance likely to be harmful or toxic. In that case, the possessor or controller of that item is strictly liable for compensation, even without proof of willfulness or negligence. This liability is only negated if the damage can be proven to result from force majeure or

actions taken under the explicit order of a competent official. Finally, the Act prescribes civil penalties for violations of rules prohibiting actions that cause deterioration of water sources, impair the benefits of water use, or introduce toxic pollution or harmful conditions to water sources, ecosystems, or public health.

Operating under the authority of the law, the National Water Resources Committee (NWRC) functions as the nation's high-level organization established pursuant to the Regulations of the Office of the Prime Minister on (Water Resources Management, B.E. 2550, 2007). Its mandate includes key responsibilities such as advising the Cabinet on policies, budgetary

frameworks, work schemes, and operational blueprints for water governance. The NWRC also plays a crucial role in coordinating efforts among government agencies, local administrative bodies, and other committees whose work intersects with environmental issues and water-related disaster prevention. Furthermore, it is responsible for establishing allocation priorities and controlling water use within specific sources to ensure an appropriate balance and correspondence with competing demands from sectors such as consumption, industry, and agriculture. Finally, the Committee considers and approves the management rules and conditions proposed by the respective drainage basin committees.



**Figure 2 :** Structure of the National Water Resources

The Office of the National Water Resources is the secretariate of NWRC, having duties and authorities to be responsible for administrative works of NWRC and to scrutinize, to give opinions, and to conduct water chart to be proposed to NWRC for considering and giving an approval.

As previously established, Thailand's water resource management system is highly complex, with numerous government entities operating under specific mandates and responsibilities. By scrutinizing the roles entrusted to these various agencies, the researcher has categorized the existing water governance structure based on three core functional areas:

- **Executive Functions**  
These bodies are chiefly responsible for driving policy implementation, providing vital support spanning budget allocation to academic consultation to other operational groups, and overseeing the crucial process of monitoring and evaluation. Key examples include the Ministry of Interior, the Ministry of Natural Resources and Environment, and the Bureau of the Budget, among others.
- **Regulatory Functions**  
Agencies under this classification play central roles in issuing water-use permits (licenses), overseeing water supply and sanitation infrastructure, and periodically reviewing or adjusting

water-use tariffs. This group encompasses organizations such as local administrative organizations (LAOs), the Royal Irrigation Department, the Provincial Waterworks Authority (PWA), the Metropolitan Waterworks Authority (MWA), the Department of Groundwater Resources, the Department of Health, the Department of Disaster Prevention and Mitigation, the Pollution Control Department, and the National Water Resources Committee.

- **Services Provision**  
This final group consists of agencies that directly deliver services related to water resource management, water supply, and sanitation. Prominent examples include the Provincial Waterworks Authority (PWA), the Metropolitan Waterworks Authority (MWA), local administrative organizations (LAOs), and private-sector organizations whose work intersects with these vital areas. In respect of the current water management procedures of Thailand, the water utilization can be mainly divided in to 3 types: Type 1 Use of public water resources for the living, Type 2 Use of public water resources for the industry, and Type 3 Use of public water resources for a large-sized undertaking. The procedures of water management for each type of water utilization are shown in the following diagram.

#### 4.4 Water Management Procedure

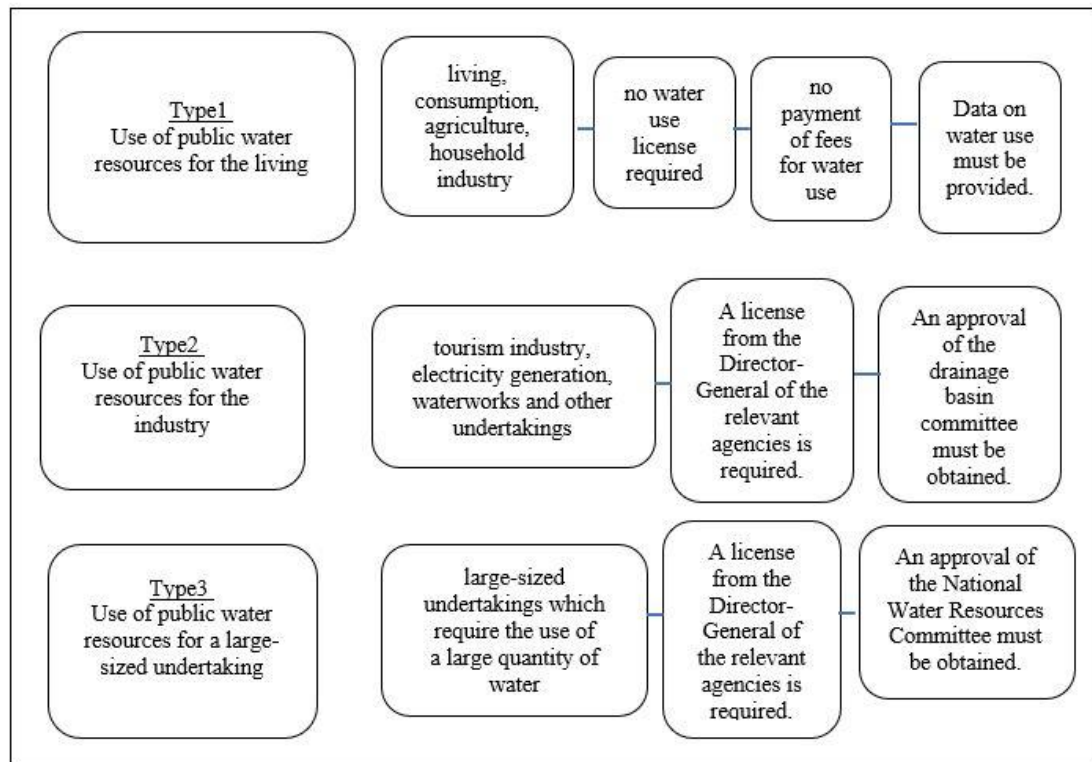


Figure 3: Public Water Resources Management Procedure

To apply for a water use license under Type 2 or Type 3, applicants must submit a comprehensive water management plan along with the official application form. It is evident from the procedural chart, which serves as the principal legislation governing water resources, mandates licensing for two specific categories of public water utilization (Water Resources Act B.E. 2561, 2018):

- Type 2 Water Use: This category encompasses the utilization of public water resources for large-scale operations, including industrial activities, tourism, electricity generation, public water supply (waterworks), and similar enterprises.
- Type 3 Water Use: This applies to the utilization of public water resources by major undertakings that necessitate the extraction of substantial volumes of water, or those operations whose potential impacts might extend across multiple river basins or cover vast geographical regions.

## 5. DISCUSSION

### 5.1 Considerations on Water Management under the Water Resources Law

Based on the study's findings, the researcher observes that Thailand consistently contends with water scarcity affecting domestic, agricultural, and industrial sectors, alongside periodic flooding events. The primary factors driving these issues are attributed to human activities, localized climate fluctuations, and the uncontrollable natural phenomenon of erratic, unseasonal rainfall.

Therefore, it is necessary and essential to focus on effective and efficient water management. Currently, the water resources management of Thailand is having problems as being discussed as follows.

- There are various government agencies involving in the water resources management in each river basin. The operation under their authorities and duties are overlapped. Coordination between them lacks of continuity, making the operation less united. These

cause conflicts on the needs of water, allocation, development, and conservation of water resources.

- According to the analysis on the structure of water resources management of Thailand, it was found that the structure is drawn from up to down, or it can be said that it mainly depends on policies from the federal government or political authorities. As a result, when there is any project to solve problems for the people, such as construction of dams, no in-depth study is conducted to acquire and understand real requirements of people in the communities.
- As the rights to use water are currently established for all Thai people, this is a gap where people can use water unlimitedly and freely, causing less effective use of water and inequality on the rights on the use of water resources.

Although many agencies have tried to solve these problems and implemented many construction projects and water resources development projects, the results of the implementation is less effective.

Despite the promulgation which fundamentally aims to systematize management and allocation by usage type and to foster unity by legally empowering local participation through the establishment of Water User Organizations (WUOs), several critical issues remain to be addressed (Water Resources Act B.E. 2561, 2018).

#### Issue 1: Centralized Authority and Operational Deficiencies

The Act structures the system around a centralized regulatory body, the National Water Resources Committee (NWRC). While the NWRC is mandated to set crucial rules, regulations, and policies, its design prevents it from functioning as an operational agency capable of swift execution and immediate problem-solving regarding water resource management. Simultaneously, the Thai water sector is characterized by a multiplicity of existing agencies, each with disparate responsibilities. A recurring problem is that the data collected by these agencies often overlap, conflict, or lack concordance, severely hampering efforts to access reliable information needed to formulate practical, unified management guidelines.

#### Issue 2: Delays in Subordinate Legislation

As the principal legal framework, necessarily provides broad provisions (Water Resources Act B.E. 2561, 2018). Consequently, the NWRC has been assigned the vital task of drafting and finalizing subordinate (secondary) legislation. These necessary secondary laws cover critical administrative details, including application and issuance procedures for licenses, license validity and renewal, transfer protocols, specifications for Type 2 and Type 3 water use, and the determination of corresponding fee structures. The full implementation of these detailed regulations is essential to bolster Thailand's water management capacity and ensure thoroughness, fairness, equality, and long-term balance and sustainability. However, the necessary process of preparing and consulting on these subordinate pieces of legislation remains ongoing.

### Issue 3: Lack of Economic Incentives for Efficiency

While the current water law successfully mandates public engagement, primarily through the establishment of WUOs, and includes numerous punitive measures aimed at controlling water quality and preventing environmental pollution, it notably lacks measures designed to actively incentivize responsible water use by the public or private sector. Specifically, the absence of mechanisms such as taxes or fiscal policies to promote water-use efficiency represents a missed opportunity. Given that water efficiency is paramount for achieving maximum benefit and sustainable management, the reliance solely on regulatory and punitive measures is insufficient.

According to the issues above, there are gaps and impacts due to the enforcement water resources management procedure of Thailand is still incomplete and incomprehensive in all dimensions of water management principle, which concerns participation of people in the area under the good governance in water management (Water Resources Act, B.E. 2561, 2018).

### 5.2 Guidelines on Water Management of Thailand for Sustainable Conservation of Water Sources

Considering the analysis of Thailand's water management, relevant governmental entities must integrate supplementary concepts into their water allocation strategies (Water Resources Act B.E. 2561, 2018). This integration is vital for the effective and equitable distribution of the nation's water resources while simultaneously ensuring the conservation of water sources for future generations. Since efficient allocation directly leads to optimized water use and long-term sustainability, these strategies should complement the public participation principle already enshrined in the Act. One globally recognized framework is 'Water Governance,' which emphasizes water resource management through four key dimensions: society, economy, politics, and the environment. Another foundational concept is the Royal Water Management Philosophy of King Bhumibol Adulyadej, which prioritizes resolving critical issues such as drought, flood management, and wastewater treatment to ensure citizens have access to adequate water for livelihoods and consumption. Furthermore, the 'Lokales Gesetz' principle is relevant, as it focuses on securing the community's fundamental right to participate in the management, preservation, and utilization of local water resources. Under this principle, communities have the right to offer guidance and recommendations to state agencies on any operational activity that may impact their residents' welfare. Where a community maintains traditional practices or local wisdom related to water use and conservation such as the 'Sueb Chata Mea Num' ceremony (a ceremony to prolong a river's life) that instills a strong sense of care and conservation consciousness, the government should be obligated to implement legal frameworks with due consideration for these established local wisdoms and customs.

## 6. CONCLUSIONS

Thailand's current strategy for water resources management centers on governing the nation's 22 river basins, aiming to optimize efficiency and satisfy public demand. This involves establishing systematic water management protocols based on usage categories, as mandated by national water legislation. To consolidate and streamline water governance nationwide (Water Resources Act B.E. 2561, 2018). Nevertheless, the system continues to face substantial obstacles. Key challenges include the redundancy and fragmentation of responsibilities across various agencies, a centralized administrative model that often restricts meaningful local involvement, and suboptimal water-use efficiency stemming from historic, largely unrestricted rights granted to private entities. These structural flaws contribute to governance that is often disjointed and fails to deliver effective outcomes. Relying solely on legal measures is inadequate for achieving sustainable water management goals. A truly successful strategy requires the fusion of robust legal

frameworks with effective participatory mechanisms, sound governance principles, and coherent institutional coordination. Furthermore, cultivating public understanding of the intrinsic value of water resources is paramount. Citizens must actively embrace water-saving behaviors, ensure sufficient water reserves for both agricultural and industrial use, and help mitigate the perennial risks of drought and flooding.

Furthermore, improving water quality and reducing pollution are critical for enhancing the effectiveness of water resource management in both qualitative and quantitative terms. For Thailand to achieve long-term water security and sustainability, it must strengthen institutional frameworks, promote efficient water use, and align national strategies with Sustainable Development Goal 6 (Clean Water and Sanitation) and related global targets.

## SUGGESTIONS

In light of the study's conclusions, the subsequent recommendations are put forth to strengthen the sustainability of water resource governance in Thailand:

- Delegate operational execution powers to the core governing body and guarantee the inclusion and representation of water users in all relevant decision-making forums.
- Expedite the issuance of subordinate regulations stipulated to establish clear implementation guidelines and foster transparency, equity, and fairness in application (Water Resources Act B.E. 2561, 2018).
- Implement regulatory and fiscal instruments designed to promote efficient water consumption and comprehensively revise obsolete legislation to align with contemporary environmental and societal requirements.
- Incorporate broader principles of water governance, complementing existing public participation mandates, to establish a managerial structure that is both more comprehensive and highly effective.

## DECLARATION OF OWNERSHIP

This report is my original work and is based on legal research conducted under the projects Upper Southern Basin Water Plan and Mae Klong Basin Water Plan, which were submitted to the Office of the National Water Resources, Thailand.

## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest that relate to the research, authorship, or publication of this article.

## ETHICAL CLEARANCE

This legal research was conducted in compliance with institutional ethical standards. The study did not involve human or animal subjects and therefore did not require formal ethics approval under the institutional guidelines.

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