Groundwater Governance and Management in Lower Mekong Basin

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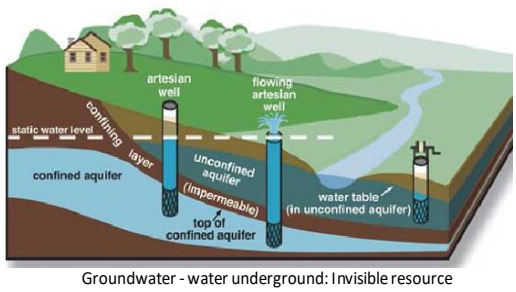
Preamble

Groundwater plays a significant role in the livelihoods and food security of millions of people, particularly in the developing world and its significance is growing. It is the main driver for the rural and regional economic growth of most of the countries as their agrarian economy is intricately linked with the groundwater irrigation. Over the last couple of decades, the use of groundwater for irrigation has increased substantially all over the world. Globally, irrigated agriculture is the largest abstractor and predominant consumer of groundwater resources. It has brought major socioeconomic benefits to many rural communities in Asia, Middle East, North Africa, and Latin America – with numerous countries establishing large groundwater-dependent economies. However, this extensive use of groundwater that contributed to the agricultural economy is under serious threats of resource depletion and degradation in many parts of Asia, particularly in South Asia.

Long-term decline in groundwater levels, deterioration of groundwater quality, problems of salinity, drying up of wetlands, and low flows in streams and rivers during summer months – are all cited as undesirable environmental consequences of unplanned intensive groundwater use in agriculture. In most situations, groundwater development progressed in stages without much coordination of activities towards aquifer management that resulted with time in a progressive decline in the water table and/or piezometric levels, associated with adverse environmental consequences as mentioned. It is imperative that efforts are made to understand the nature and behavior of the groundwater system and adopt adequate measures to regulate the abstraction of water so as to maintain certain groundwater levels and conserve its quality to meet the water use requirement as well as the requirement for groundwater-dependent ecosystem and to foster sustainable development and management of groundwater resources.

Mekong River - Surface water source: Visible resource



Groundwater - water underground: Invisible resource

Groundwater in Lower Mekong Basin: Management Initiative

Groundwater is an important water supply source for domestic water use, for industry, and for irrigation and agricultural purposes in the Mekong River Basin. This resource is being increasingly used in the riparian countries to supplement the shortage of surface water in areas where surface water is the predominant source of water supply, to meet the demand for water in areas where surface water is not easily accessible as well as to meet the demand during the dry season when the shortage of availability of surface water is imminent. Groundwater also plays an important role in supporting natural river water flows and relevant ecosystems. In the Lower Mekong River Basin, groundwater provides water for approximately 60 million people. Frequent water shortage problems in this area are normally managed by increasing the supply from groundwater resources, particularly during the dry season (Lee et al., 2018). However, under conditions of rapid population growth and increasing human activities, countries in the basin are experiencing depleted and degraded groundwater supplies. Inadequate management of groundwater in recent decades has resulted in adverse consequences and environmental issues, such as groundwater depletion, groundwater quality deterioration, land subsidence, and saltwater intrusion in coastal areas.


Groundwater irrigation in Lao PDR

The rapid expansion of groundwater exploitation and its contamination in member countries currently poses an immediate concern for the water supply in the region. Furthermore, the use of groundwater resources is expected to increase in the future because of the high buffering capacity of groundwater storage against climate change. Adequate knowledge of characteristics and understanding of the behaviour of the underlying aquifer systems of the basin, which are mostly of transboundary nature, is very much needed to support decision-making in equitable sharing of the resource in a sustainable manner. Also, a comprehensive investigation with an appraisal of all current and future stresses on the physical system including the anthropogenic activities and impact of climate change and variability within a socio-biophysical setting is needed. The transboundary cooperation in surface water management in the Lower Mekong River Basin has progressed quite satisfactorily in recent years; however, there is no common approach or even modest recognition and cooperation for groundwater resources. A number of recently published articles and reports dealt with the overview of transboundary aquifers in the Mekong River Basin on the regional scale and highlighted the need for comprehensive assessment and collaborative efforts in the development of this resource (KIGAM, CCOP, and UNESCO, 2015; Dam and Jayakumar, 2017; Lee et al., 2017; Lee, et al., 2018).

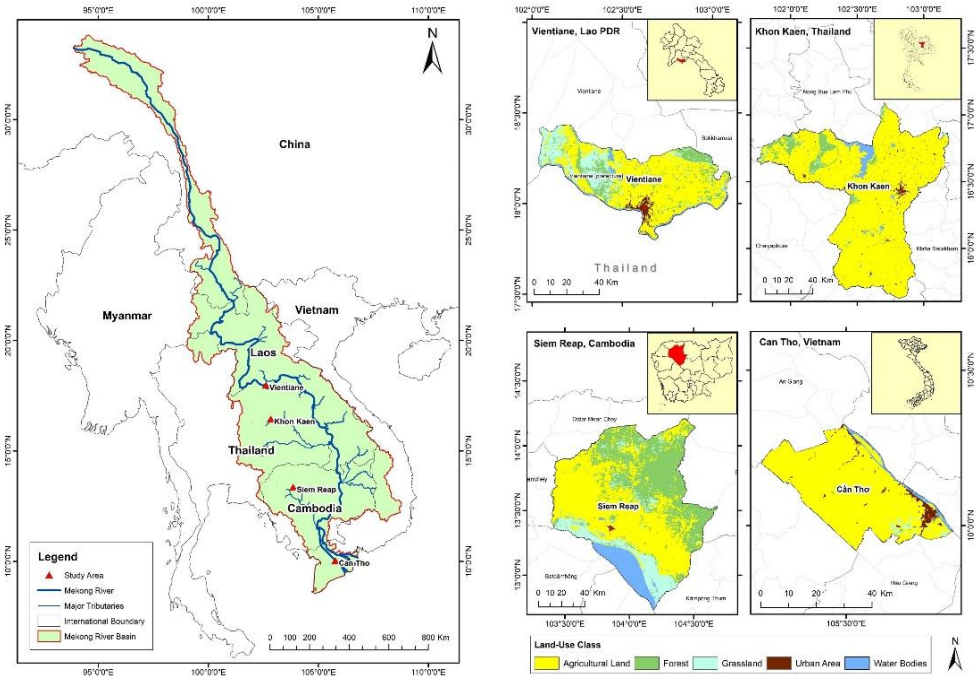
One of the recent initiatives to foster collaborative efforts among member countries in the Greater Mekong Sub-region was taken by CCOP, KIGAM, and UNESCO. Since 2013, international collaborative workshops on groundwater resources in the Mekong-Lancang River Basin have been organized with attendance and contributions by all Mekong countries. Within the framework of the CCOP-KIGAM Project "Solutions for

Water wells in Cambodia

Groundwater problems in the CCOP Region", the workshops aimed to share information between countries and discuss future collaborative work for the sustainable management of the water supply. Over the four- year period several workshops were organized and more than 130 groundwater experts from different organizations and countries in the Mekong-Lancang River Basin (Cambodia, China, Lao PDR, Malaysia, Thailand, and Vietnam) have presented the status of the groundwater development and discussed groundwater issues and proper management. It has been reported that a permanent regional network of hydrologists and groundwater managers in the Mekong Basin was established and continuously developed as a foundation for collaboration in research and managing transboundary groundwater issues. However, it is not clear whether this regional network has been institutionally recognized and officially formed so that it can bring in strategically needed changes to foster collaborative research and assessment.

Way Forward: Comprehensive Investigation Planned

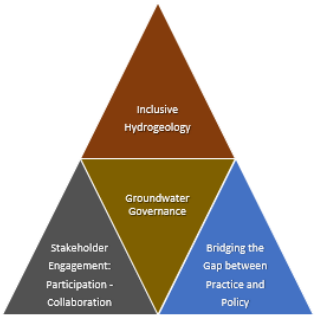
Most research programs associated with transboundary aquifer management have focused on the development of transboundary aquifer inventories by identifying and delineating these aquifers on regional and global scales. Less attention was given to the development of a detailed database for hydrogeological information, aquifer status, and flow regimes of the shared aquifer systems. Different interests in utilizing groundwater resources between countries have restricted to undertake any initiative to utilize the resources on a shared basis. Also limited or no attempt was made to review critically the governance and management system for any scale of development to come up with recommendations to strengthen the current practice.



Mekong River Basin and Selected Case Study Areas

To address this issue, the project on "Strengthening Groundwater Governance in Rapidly Urbanizing Areas of the Lower Mekong Region" is initiated and is funded by Stockholm Environment Institute (SEI) under SUMERNET 4 All: Groundwater Integrated Regional Assessment (GIRA). The major objective of the project is to evaluate the current state of groundwater governance in the selected rapidly urbanizing areas of the Lower Mekong Region and to recommend the ways to strengthen the groundwater governance from an evidence-based understanding of groundwater availability, its use, and potential conflicts under multiple stresses in the future (focusing on vulnerable and marginalized groups). Four rapidly urbanizing areas of the Lower Mekong Region are selected to conduct the project activities and they are Vientiane Capital City in Lao PDR; Khon Kaen in Thailand, Siem Reap in Cambodia; and Can Tho City in Vietnam.

In this project, groundwater governance refers to those political, social, economic, and administrative systems that are explicitly aimed at developing and managing water resources and water services at different levels of society that rely solely or largely on groundwater resources. This definition includes all related mechanisms including financing, knowledge, and technical capacity, and the rights and responsibilities of sector players (including water users). An integrated assessment approach with a multidisciplinary team is adopted to analyze the current state of groundwater governance and provide recommendations for its improvement for sustainable development and management of groundwater ensuring the equity of water access in the context of divergent socio-economic interests giving due consideration to the cultural and ethnical diversities and environmental and climate change impacts. Participatory and multi-stakeholder consultation/analysis and frame analysis are used to capture values, interests, preferences, conflicts, and interactions of actors regarding groundwater use and management. Also, a qualitative methodology such as a review of policies, legal and institutional frameworks, reports, and peer-reviewed articles; interviews of relevant stakeholders is planned to analyze the current state of groundwater governance at the national and local level of all areas. The expected outputs from the project are:



Decentralized GW Governance

i) spatial and temporal availability of groundwater resources, its use by different sectors, and its contribution to water security for agriculture, industry, and other vulnerable groups;

ii) the existing institutional and policy framework and their strengths and weaknesses for the sustainable groundwater management;

iii) vulnerability of groundwater resources to demographic change, socio-economic development, and climate change including extreme events;

iv) recommendations for improvement or strengthening groundwater governance and management to address multiple stresses, social equity, conflicts, and gender dimensions; and
v) several knowledge products: three peer-reviewed journal articles; two policy briefs; communication products (news article, short film).

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