

Problems of Correlation of Environmental and Economic Aspects When Using the Mekong River by Coastal States

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ABSTRACT

The Lower Mekong Basin is entering a crisis period during which upcoming development decisions will be reflected in the economy for decades. Due to pending economic decisions regarding the development of hydropower, the expansion of industry, fisheries and the agricultural economy in the region, sectors and countries cannot afford to continue to work independently. In order to create a sustainable and prosperous economic future for all countries of the basin, we must understand the relationship between the economic benefits of planned water projects and environmental conservation. In fact, a regulatory regime for sharing water resources will be established and sustainable only when coastal states clearly identify priority economic incentives and act in accordance with international law. It should be noted that almost economic activities in the Mekong Basin at different levels rely on the ecosystem and its resources. Despite the fact that the Mekong River Commission is a successful example in regulating the joint use of water resources, as well as in coordinating interests between coastal-member states, coastal-nonmember states and donor states, this mechanism reflects the shortcomings in maintaining the economic and economic balance. In the global climate change context, the author calls for the need to develop a legal mechanism with the full participation of all coastal states for the sustainable development of the basin.

Keywords: *economic benefits, joint use of the Mekong River, biodiversity, climate change, hydropower*

1. INTRODUCTION

The Mekong River has great economic potential due to its rich biodiversity, which contribute to the development of fisheries, rural economies, irrigation, water trade, tourism and hydropower. There are typical species of fish and plants like the legendary giant Mekong catfish, Kai freshwater weed - an important source of income for local people in Laos, timber, minerals and oil and gas reserves [1]. Moreover, the latter is a key element of the water conflict in the basin. The relationship and interconnectedness between the economy and water and the ecosystem are complex in the Mekong basin regarding socio-economic (investment, employment), productive (food security, energy, goods) and natural (flows, sludge and wild fishing) systems that indicate the impact of sustainable water management on the civilizational development of business, government and civil society as a whole.

Each country in the region and most economic sectors are interconnected and interdependent on the Mekong River, especially when it comes to the states of the lower basin, since the Mekong River and its related advantages expresses in the social, economic and cultural aspects of the life of the population, and also reflects the cross-border relationship between the coastal states regarding equal and

equitable separation, as well as the issue of sustainable use of the Mekong River water management.

Accordingly, 86% of the total population of Cambodia live in the Mekong River Basin, 91% for Laos, 37% in Thailand and 22% of the Vietnamese population, which consists of more than 100 ethnic groups, creating an authentic region with the richest culture in the world. However, rapid population growth (1-2% in Thailand and Vietnam, 2-3% in Cambodia and Laos) requires food security and energy provision. Moreover, increasing water demand in various fields such as agriculture, infrastructure, services sector to provide the necessary conditions for economic existence is also a significant problem in coastal states.

Coastal states need to be adequately adapted to key areas that are most vulnerable to global climate change, such as: the impact of climate change and human exploitation on water, nutrients and sediment flows; adaptation to climate change in urban centers and rural areas; as well as transboundary water management [2].

For one part, cooperation is a necessary tendency to satisfy growing water and energy consumption in the context of changing circumstances (population growth, economic activities, climate change) [3]. For the other part, the coordination gives a rise to agreed obligations that must be respected, including environmental protection. International practice shows that there is a great limitation of multilateral or bilateral agreements on the joint

regulation of transboundary water flows due to the highly sensitive and politicized nature of this problem.

2. MATERIALS AND METHODS

The paper was carried out with the use of various scientific methods and approaches, in particular the dialectical method of scientific knowledge as the highest philosophical and worldview research methods. The author accepts general scientific research methods as: analysis, synthesis, analogy, a logical method and a systematic approach, as well as private law methods as a comparative legal and statistical method.

3. RESULTS

Since the 1960s Vietnam, Laos, Cambodia and Thailand began cross-border cooperation on the joint use of the Mekong River Committee, which was renamed as the Mekong River Commission in 1995. The priority is the development of hydropower, which helps to reduce poverty, improve irrigation systems, and prevent flood and provide energy security to the region. Over 60 years of activity, the Commission supports a large number of projects that subject the socio-economic development of coastal states.

However, the relationship between the upper and lower states still remains a critical example regarding the construction of China on top of the river. In particular, since the 1990s. China unilaterally began operating the Mekong River by building massive dams, expanding the irrigation system that resulted in a water conflict with other states. The development of hydropower in coastal states is central to criticism and conflict in the basin [4].

Socio-economic cooperation between the six coastal states has actually been strengthened since 1992 within the framework of the Greater Mekong Subregion (GMS), an auxiliary program under the Asian Development Bank, which guides high-priority regional projects in various fields, such as: agriculture, energy, ecology, development of the healthcare system and career resources, information and communication technologies, tourism, transport, transport and trade facilitation, as well as urban development.

It should be noted that China voted against the adoption of the 1997 UN Convention, refused to participate in the full membership of the Mekong River Commission. That is, GMS is a single joint mechanism for sharing the Mekong River with the participation of China. Under this program, downstream states can achieve a common phenomenon with China regarding the exploitation of the Mekong River.

In recent years, the Mekong basin states have reached a high level of economic development (5-8%), while agriculture occupies an important place and provides work for local residents. At the same time, poverty, large differences in incomes, foreign monetary debts, bad debts,

world integration present urgent economic problems that the coastal states of the Mekong River face. However, the power of economic development of coastal states is different. Due to national characteristics, each country sets priority areas for economic development.

Thailand, in particular, is the most developed state in the region and concentrates on the formation of capital, the development of the labor market and the private sector of the economy, as well as the creation of favorable conditions for the growing sphere of fintech services.

Along with its urban development Vietnam is actively adapting legislative conditions to attract foreign investment and privatization in accordance with international standards on free trade. Infrastructure and monetary policy are the focus of economic development in Cambodia. In Laos, industry and energy exports are expected to create the preconditions for economic development.

However, limiting efforts in other sectors and environmental disasters may hold back development. Myanmar places particular attention on attracting foreign direct investments to stimulate economic activity. Nevertheless, the stability and sufficiency of power supply, affordable and equal education can be of a problem.

China has achieved a high rate of economic development in recent years and is ranked as a second state in the international arena. However, there are slows in growth as the economy was re-planned from an investment to a consumer trend. Great socio-economic, environmental pressures can also affect China's potential development. It must be emphasized that China is the main player in the construction of hydropower plants and operational processes. Moreover, China is not a full member of the Mekong River Commission and must not comply with contractual requirements. Many studies show that dam activities will negatively impact the states of the lower Mekong River Basin.

The region's economy is connected with China in different ways. We are talking not only about the use of the Mekong River, but also about the historical and current economic issues in general. This report also shows that most of the water ecosystems of the Mekong basin are under pressure from settlements, economic development (including poorly planned dams), over-exploitation and destruction of the habitat, the consequences of which vary from increased vulnerability to drought and floods, water pollution, geomorphological changes in the river channel.

Thus, rich water resources create vital prerequisites for achieving economic development. In other words, sustainable ecosystem management is a prerequisite for economic development in the basin.

3.1. Agriculture and irrigation

This occupies an important place among economic activities, in which more than 60% of the population works to ensure food security, improve standards and living conditions as well as reduce poverty in the region.

Vietnam and Thailand are world leaders in rice exporters. However, the average GDP will make a rather low contribution - 14%. Moreover, expanding the delta area and building an irrigation system destroy the natural forest and mangroves - the living conditions of biodiversity for the Mekong River.

A traditional rainfed system is vulnerable to depletion of natural nutrients, poor management practices and the effects of climate change. Due to the lower level of technical ability and lack of water in the dry season, rural productivity is reduced. The dam reservoir at the top will help preserve water in the dry season, supporting the rural economy. On the other hand, it is linked to flood control and hydropower development. However, poorly planned expanded irrigation systems pose a number of environmental problems.

The Mekong River is important not only for its water, but also for the related actions provided by the sediment of the river, more than half of which occurs from the upper reaches of the river, ensuring biodiversity of the basin and preventing salinization, unlike other large rivers like the Mississippi or Amazon [5]. Sludge with rich substances in the Mekong River creates the living conditions for the development of the "rice cup" in the Mekong Delta (Vietnam) and Tonle Sap Lake (Cambodia).

At the same time, the Mekong Delta is the final stream of the river, where about 20 million Vietnamese live directly, the economy of which depends on the annual and seasonal water flow and sludge. In particular, approximately 40% of the country's total rural products, including 50% of the exported quantities of rice, are produced in the Mekong Delta. Rice and tent products make a significant contribution to export earnings and make up about 27% of gross domestic product.

Sediment load is critical to the functioning of any major river delta, on the basis of which economic activity flows. However, existing dams and dredging along the Mekong River significantly affect the amount of sediment, flow regime, salt water penetration, navigation in the delta, as well as the functioning of the ecosystem, especially in the Mekong Delta in Vietnam - the lowest current [6].

Under the influence of natural and artificial manifestations, the Mekong Delta, especially the part located in the Vietnamese territory, is facing a significant change [7]. Basically, it is necessary to consider all of these factors in the context of interacting manifestations. For example, the economic values of the Mekong Delta are significant and directly dependent on environmental factors, such as precipitation flows and nutrients.

Obviously, subsidence, deterioration in water quality, salinization, flooding, erosion of the riverbank and coastal environment are actual risks, as a result of which it affects agriculture and fishing. In other words, each environmental change directly affects related economic impacts, respectively.

However, poorly planned impacts will significantly change the annual quantity and flows of sludge, everything will have to do with a complex change in the level of sea water, precipitation, subsidence, tides, tics, waves, wind, etc., the

consequences of which are the destruction of the traditional habit of the basin economy.

It is worth noting that floodplains play an important role in the Mekong basin in food security, fisheries, replenishment of groundwater resources and water purification [8]. This study also proves that the states of the lower Mekong Basin focus mainly on the quantitative reclamation of the floodplain in order to achieve economic benefits without a comprehensive study of its impact on the ecosystem, including the reproduction of reclamation areas in the flood and flood model, water quality, etc. Preventive measures are necessary to be taken to preserve the Mekong River in the context of human impacts and climate change.

3.2. Fishies

The Mekong River has rich fisheries with 1,500 species of freshwater fish (3rd place after the Amazon and the Congo among international rivers), which represents the food demand of local populations and produces about 18% of the world's freshwater fish production (755,000 - 2.6 million tons) [9]. Related fisheries related sectors such as shipbuilding or fishing gear also make significant contributions to the overall basin economy. It is worth noting that about 37% of the fish in the Mekong River are migratory, whose existence is directly affected by environmental characteristics [10].

Despite this, there is still a misunderstanding about the migration behavior and ecosystem needs of most fish species. Moreover, active human exploitation and mass construction of dams along the Mekong River and its tributaries significantly affect the ecosystem, including river connections, streams, water temperature, the consequence of which changes the natural orbit of fish and water plants. Along with natural manifestations, fishing and rice production are threatened by millions of local residents of the Lower Mekong River Basin [11].

As noted, the lack of in situ information and data on various water quality criteria, especially on changes in temperature and flow direction, can significantly affect fisheries and regional biodiversity [12].

3.3. Energy

Energy development is both a crucial economic strategy and a contested issue due to the enormous potential damage caused by hydroelectric power to the ecosystem - as indicated above, the most important prerequisites for economic development, especially for agriculture and fisheries in Cambodia and Vietnam. Hydropower is one of renewable energy and more environmentally friendly compared to traditional sources like coal, gas and electricity.

The economy of the basin, including the development of energy at different levels, depends on natural resources, including the Mekong River. The construction of

hydropower plants, including on the main course and river tributaries, is a development trend, the reasons for which are economic liberalization, a regional free trade agreement, demographic change, development needs, concerns about energy and food security, as well as the uncertainty of climate change. The Xayaburi mega-scale dam project, proposed by Laos in 2011, with a capacity of 1285 MW [13] is a boom in the construction of dams on the main course of the Mekong River in accordance with the Notification and Prior Consultation and Agreement Procedures (PNPCA) under the Mekong River Commission.

Southeast Asia is characterized by a high level of extreme poverty and low socio-economic development. Hydropower is expected to be a potential poverty alleviation in the basin. As of April 2018, 78 hydroelectric power station dams (on the main stream and tributaries) with a capacity of 15 MW or more, 33 hydroelectric power stations under construction, and 89 proposed and planned projects [14].

Laos has the natural ability to become a "battery in Southeast Asia," especially hydropower. Energy export, as a key area, will help to drive the development of the national economy. Since 1971, Laos and Thailand have established an intergovernmental bilateral relationship on energy trade. Thailand, accordingly, has access to cheaper hydropower because its own national energy is mainly dependent on oil and gas.

In turn, Laos can use part of the transmission network provided by Thailand to provide electrical access to its own remote areas. Moreover, in order to expand further the exchange of energy, Thailand acted as a project developer in the field of electricity production and transmission in Laos. Currently, Laos has entered into an agreement with Vietnam on this model.

Despite significant economic and energy potentials, coastal states need to work together to balance environmental sustainability and economic development. Currently, only China has a hydropower plant on the main stream of the Mekong River, Laos began in 2010 the process of building the first of 11 planned dams on the main stream of the Mekong River. The refusal of the full participation of China and Myanmar in the Mekong River Commission poses a potential risk in the management of transboundary water resources [15].

The reduction of biodiversity and the loss of culture and heritage, and other social and environmental problems cause the most serious manifestations of damage to ecosystem functions and threats to food security for local residents [16]. The transboundary water management in the Mekong River is a subject of criticism, in particular, the impact of Chinese dams on sedimentary loads and hydrology or Lao dams in Cambodia's fisheries [15]. Unfortunately, mainly for the Mekong countries, cross-border problems are related to investments. Hydropower is a capital-intensive industry and therefore acts as a priority. Currently, the Mekong River is one of the 5 largest river basins in the world with the most reduced flow due to drought, the impact of hydropower projects, especially on the main course of the river. In particular, a change in

runoff leads to a change in the natural habitat of migratory fish, as well as vegetation. In addition, upstream water blockage has affected soil quality in the lower Mekong Delta. Ultimately, scientists consider the harm on the Mekong River irreversible.

Increased pressure on already depleted water resources has led to an increase in conflicts between water users located in upstream and downstream areas. Solving the challenges facing the sustainable use of the Mekong River is not only one country's business, but also the need for cooperation between interested countries and the support of the international community. The 3rd high-level meeting of the International Mekong Commission was held from April 4 to 5, 2018 in Siem Reap (Cambodia).

The agenda of the meeting includes: "Strengthening joint efforts and expanding partnerships to achieve the Sustainable Development Goals (SDGs) in the Mekong River Basin". The meeting gives countries the opportunity to recall the activities of the International Mekong Commission over the past four years, identify relevant areas of cooperation to overcome difficulties and contribute to the achievement of the sustainable development goal.

Faced with the main challenges facing the Mekong River Basin, MRC is actively contributing to the implementation of the Five-Year Strategic Plan (2016–2020), which consists of seven key outcomes and more than 190 events with a total estimated budget of about \$ 60 million. The aim of the Strategic Plan is to implement the priorities of the Basin Development Strategy based on integrated water resources management, to continue the transfer of key river basin management functions to Member States, as well as the reform of the secretariat and the Commission.

4. CONCLUSION

At the regional and national level, the issue of the risky impact of environmental disasters on heavy human losses, huge opportunity costs, and disruption of normal life, was especially disproportionate to low-income citizens [17]. It is worth saying that the presentation of economic data is not a comprehensive assessment of loss due to natural disasters. I must say that floods and salinization are natural manifestations and "disasters" themselves are not defined. They turn into disasters only when they cause enormous damage to the life and health of the population.

For the Mekong basin, natural disasters like floods, tropical cyclones, droughts cause safety about regular losses on a large scale. Together with natural factors (climate change, the manifestation of El Nino), anthropogenic factors (fast and unplanned urbanization, degradation of natural resources, poor public administration of the institution and politics, lack of risk accounting) are the root causes [18].

The undeniable issue is the significant benefits brought by short-term socio-economic national projects. However, they address a number of issues for livelihoods, infrastructure, finance, environment, etc.

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