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Security for Water Source of Mekong River and Impacts on Vietnam National Security

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Abstract On the basis of recognizing the importance of Mekong River water source, the article shows the impact of security for water source of Mekong River water on Vietnamese national security in the Mekong Delta as well as evaluate national cooperation of Vietnam for handling security of Mekong River water source. From the data on practical survey from the Mekong Delta provinces and data researched and summed up by management agencies and international cooperation agencies in relation to security for water source of Mekong River, it shows that through diplomatic channels, Vietnam has actively participated in the exploitation, use and sharing of Mekong River water source. The study shows the inevitable trend for exploitation and use of Mekong River water source for development strategy in each nation; binding in international relations. Besides, the study also suggests some recommendations for Vietnam to ensure security for water source of Mekong River in Vietnam today.

Keywords Security of water source, National security, International cooperation, Mekong River

1. Introduction

Water is an essential resource which is especially important for the sustainable development of each nation. This is also a finite resource. Therefore, security for water source is the top concern in the world. For water sources from international rivers, the security is highly dependent on international cooperation between the countries involved in the exploitation and use of this water source. Mekong[1] is the river that is especially paid attention by Asian countries. It is the "transnational resources" exploited and managed by six countries. However, the national vision and interests of the countries are different, leading to instability in security for water source in this river, causing impacts on the national security of Vietnam: China and Laos are making the most of hydropower exploitation for economic development; Thailand thoroughly exploits irrigation to serve the northeastern region; Cambodia wants to maintain great seafood source in Tonle Sap Lake[2]; Vietnam does not want saltwater intrusion to be more serious, affecting food and seafood in the Mekong Delta, which shows that adjustment for exploitation and management activities of any country that river crosses has impacts on the national security for the remaining countries. Vietnam is the country which has the last flow before exposing sea, is strongly affected by security of water source.

The Mekong Delta of Vietnam is the last region of the Mekong basin, which is Vietnam's rice field, providing rice and export aquatic resources. However, 95% of the water flow to the Mekong basin is from the upstream of Mekong River. Due to great dependence on external sources, security of water source in Vietnam may be threatened by neighboring countries, especially those in the upstream of

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1 The Mekong River originates from the Tibetan plateau, flows from a height of 5000m in the southwest, through Yunnan (China), at the intersection of the three countries including Myanmar, Laos and Thailand. After merging with the Tonle Sap River in Phnom Penh (Cambodia), it splits into the Bassac River (220 km) and the Mekong (240 km) flowing in parallel. At the end of basin, the Mekong splits into nine tributaries in the Mekong Delta (Vietnam) before exposing East Sea. According to Diplomat magazine on MRC's assessment, the total annual fishing output in the Mekong reaches 4,4 million tons - an impressive figure, accounting for 13% of the total value of fishing output as 130 billion USD in 2015.

2 Tonlé Sap or Cambodia's Lake is a system of combining lakes and rivers which has great importance to Cambodia. This is the largest freshwater lake in Southeast Asia and recognized by UNESCO as a world biosphere reserve in 1997. The lake connects with the Mekong River in Nam Vang through a river named Tonle Sap. It plays a special role in regulating floods for the Mekong Delta. In the rainy season, river water from upstream of Mekong will flow back into the lake, leading to flood the surrounding fields and forests. At that time, the lake has an area of 24,605 km^2, depth of approximately 9 meters . In the dry season from November to May next year, water from the lake will flow downstream to the sea. At that time, the lake has an area of only 2,590 km^2 and depth of 2 meters, even some places have depth of only 1 meter. Such Lake is to regulate the flow in order to reduce flooding in the downstream area.

Mekong. The thorough exploitation of resources from Mekong River without the close cooperation between countries has made Mekong Delta in Vietnam reduce seriously in water flow, sediment residues, aquatic resources and threatens to food security that is an important source of national security. In addition, the countries are using water source as a "weapon" in international relation of Vietnam. Water source of Mekong River has a direct impact on Vietnamese national security. Therefore, it is essential to study and evaluate the impact of security for water source on Mekong River for purpose of suggesting appropriate international cooperation between Vietnam and other countries that share the Mekong River for socio-economic development and security and ensuring national security for Vietnam.

For Vietnam, the Mekong River plays a special role in nurturing two key economic regions including the Mekong River Delta and the Central Highlands, with nearly 60% of Vietnam's total annual flow and approximately 23% of the total population (Cuu Long River Delta has an area of over 40.000 km^2, accounting for 12% of the total natural area of the country, including 13 provinces and cities with a population of over 17 million people, annually contributing 27% of GDP with 90% of export rice and nearly 60% of Vietnam seafood export turnover).

(Source: Lâm Hoàng (2018), *Vai trò đặc biệt của sông Mekong đối với Việt Nam,* http://baochinhphu.vn, ngày 30/3/2018.)

Table 1. Area and contribution of flow of the Mekong River in each country

No.	Country	Basin area (km^2)	Rate compared to the whole basin (%)	Contribution of flow (%)
1	China	165000	21	16
2	Myanmar	24000	3	2
3	Laos	202000	25	35
4	Thailand	184000	23	18
5	Cambodia	155000	20	18
6	Vietnam	65000	8	11
	Total	795000	100	100

(Source: *Introduction of the Mekong River Basin*, Vietnam Commission of Mekong River, http://www.vnmc.gov.vn/newsdetail/18/gioi-thieu-luu-vuc-song-me-cong.aspx, 2017)

In the world, there are many studies on security of water source on the aspects of socio-economic, sustainable development and national security. UNESCO-IHE Institute of Water Education (established by UNESCO and the Dutch Government) affirmed the relationship of water security with political stability of the nations. According to study from the sharing of water resources on the Missisipi International River, the US Government also affirmed the importance of water security for national security as well as the need for a transnational cooperation mechanism on this issue to ensure global sustainable development [1]. Report of *World Economic Forum* continue to emphasize water security as "a link" for ensuring food security and human security [2]. Publication of *Water Committee of the United Nations* (UN – Water) shows that water security is closely linked to maintenance of peace, stability and cross-border cooperation [3].

Over the past years, Vietnam has had many studies to assess the impact of the Mekong River water source on the environment as well as on the sustainable development of the Mekong Delta. However, there has not been many studies on the impact of water security on Vietnam national security and international cooperation to ensure the security for water source of Mekong River. This study aims to assess the impacts of security for water source of Mekong River on Vietnam national security, analyze international relations in handling this issue, and then make recommendations for Vietnam in international cooperation to ensure water security of Mekong River.

2. Research Method

To accomplish goal of this article, the research team collected materials reflecting the level of water security from 13 Mekong Delta provinces (direct survey in Can Tho, Tien Giang, Ben Tre, Long An, Dong Thap, Vinh Long, Tra Vinh, etc.); collected data from reports of relevant agencies under the Ministry of Agriculture and Rural Development, Ministry of Natural Resources and Environment; Based on research results, conduct in-depth interviews with some residents and managers related to national and regional security.

Study and assess practical status of environmental security through analysis of monitoring data of Vietnamese authorities and publication of countries sharing the Mekong River, publication of the relevant research groups. Data on international cooperation assessment on security of Mekong River water is based on a synthesis of documents of the Mekong River Commission and reports of Vietnamese authorities. The research sample and survey subjects were implemented by the authors in the period from 2016 to 2019.

3. Research Result

3.1. Impact of the Mekong River water on Vietnam National Security

So far, the assessment for impact of the Mekong River water on Vietnam national security has been performed but it is not sufficient and inconclusive. In fact, in term of different aspects, there are variety of opinions about the impact of Mekong River water on Vietnam national security. Therefore, in this article, the authors continue to research on effects of Mekong River water security on Vietnam national security on the following aspects:

The security of the Mekong River is being controlled as a "weapon" to dominate and influence international relations

The Mekong River is one of the 10 largest rivers in the world, with a length of 4.880km, a basin area of 795.000 km^2, an total annual average flow of approximately 475 billion m^3, an average annual flow of 15.000m3/s [4]. The upstream of the Mekong River crosses China and Myanmar (accounting for 24% of basin area); downstream areas of Laos, Thailand, Cambodia and Vietnam (accounting for 76% of basin area) [5]. The Mekong River has a rich resource and biodiversity, ranking the second in the world (just behind the Mississippi River area), which is very convenient for economic development, especially irrigation, aquaculture and hydropower development. However, the current flow of the Mekong River is being regulated and controlled by the construction of hydroelectric dams on the mainstream and tributaries.

So far, there are 19 hydropower dams which has been planning to construct on the mainstream of the Mekong River and China is the nation constructing the highest number of large hydropower dams with eight dams completed on the upstream and 4 dams on the plan; Laos and Cambodia make plan to construct 11 dams on the downstream [4]. In June 2018, Laos implemented a plan to build the fourth hydropower plant named Pak Lay on the Mekong River (followed by Xayabury, Don Sahong, Pak Beng). Although China is the country which controls directly flow on the upstream of the Mekong River (China called the Lan Thuong River), it refuses to participate in the Mekong Agreement and believes that the water resources of the Mekong River flow through its territory is "internal water", under its absolute sovereignty, so it has full rights for use and exploitation without consent or cooperation of the countries in the basin. In the downstream of the Mekong River in Laos and Cambodia, China also invested in the construction of hydropower dams on the mainstream, which has turned the river on the downstream into a reservoir and transformed the natural essence of the flow. Therefore, there has been a serious impact on the dry season in the Mekong Delta provinces.

Apart from construction of hydropower dams, the countries also adjust flow of the Mekong River to serve the individual interests of each country. Thailand has a strategy of economic development in the northeast of this country. In order to implement this strategy, Thailand has thoroughly exploited the source of the Mekong River for irrigation. Meanwhile, Cambodia wants to maintain great aquatic resources in the Tonle Sap Lake and thoroughly use the water source of Mekong River for this country.

The hydrological measurements show that water source flowing to Vietnam in the Mekong River basin decline sharply in the dry season, leading to severe drought. Statistics have noted that the water level of the Mekong River is getting lower and lower, and it reaches a new record of low water level in 2016 within the past 90 years [6], causing seriously severe droughts and saline intrusion. In contrast to the dry season, the countries on the downstream such as Vietnam have to face up with risk of unsafety in the rainy season such as the abnormal flood discharge and broken. The reliance on water flow and time of seasonal discharge from upstream water flows has become a major challenge. With the advantage on the upstream of Mekong River, water resources have also been used as a "weapon" in international relations.

> *In 1997, China closed outfall for four days in order to work on a dam that blocked the flow of a large amount of fresh water into the Mekong Delta and make Vietnam lost 100.000 USD per day. Next, in 2016, the Mekong River Delta provinces have to cope with drought, saline intrusion across 13 provinces. The saline intrusion affects 9/13 provinces with the smallest peak flow in over the past 90 years [6]. This has a such great impact that on March 10, 2016, the Vietnam Government has to send a documentary to China to propose charge of upstream dams to improve the drought situation.*

Security of the Mekong River water threatens Vietnam food security

The Mekong Delta of Vietnam in the Mekong Basin has contributed to Vietnam 27% of GDP, 90% of rice export, 60% of seafood export turnover [7]. However, the change in water sources has made the surface water of Mekong Delta become scarce, area of arable land become narrowed and less fertile. The decline in food is getting higher and higher over time, which makes the Mekong Delta may no longer be Vietnam's rice field and seriously affects Vietnam food securitys.

Currently, the amount of alluvium deposited in hydroelectric dams is no longer sufficient to supply for this area. Hydroelectric dams in China retain 30% of the sediment, and dams built on the mainstream of Laos and Cambodia will retain approximately 5%; At least 50% of farmland in the Mekong Delta is affected by loss of alluvium and nutrition from hydropower projects [4].

> *"Previously, the amount of alluvium on the Mekong River flowing to Mekong Delta is about 73 million m3/year, in 2012, it is only 42 million m3. It is forecasted that when 19 reservoir projects are completed, the amount of alluvium flowing to the Mekong Delta is only about 10-15 million m3". Due to the alluvium deposition from the dams, the amount of raw sand will not flow to the Mekong Delta anymore, the loss forever without any compensation will cancel tectonic process of the Mekong Delta. According to report of the Ministry of Agriculture and Rural Development, the amount of nutrients has decreased from 4.157 tons/year to only 1.039 tons/year. This has reduced crop productivity by 0.6-1 tons/ha. Typically, a large-scale drought event in the southern region in 2016 caused a damage of 500,000 ha of paddy rice with 200,000 tons of rice and about USD 50 million due to*

seafood damage for Vietnam. [8].

Security of Mekong River water had impacts on human security in the Mekong Delta of Vietnam

The impacts of security for Mekong River water have direct impact on the lives of nearly 20 million people in the Mekong Delta. The change of the Mekong River flow has led to a decline in agricultural and aquatic production, narrow agricultural land area and saltwater intrusion, reversibility of traditional cultural life of the river.

Table 2. The localities in Vietnam that are most affected by changes in the Mekong Delta

Provinces	Area (Km^2)	Flooded area	Flooded rate
Ben Tre	2,257	1,131	50.1
Long An	4,389	2,169	49.4
Tra Vinh	2,234	1,021	45.7
Soc Trang	3,259	1,425	43.7
Ho Chi Minh City	2,003	862	43
Vinh Long	1,528	606	39.7
Bac Lieu	2,475	962	38.9
Tien Giang	2,397	783	32.7
Kien Giang	6,224	1,757	28.2
Can Tho	3,062	758	24.7
Total	29,828	11,474	38.5

(*Source: Rapid Assessment of the Extent and Impact of Sea Level Rise in Vietnam – Jeremy Carew – Reid*, 2017)

The Mekong River plays a very important role for the Mekong Delta. The amount of alluvium from Mekong River reduce erosion along the coast. The annual flood cycles from the Mekong River help the Mekong Delta push saline water, wash alum, and improve soil to contribute to improvement of agricultural productivity. However, today, along with the declince and change of flows from the upstream of Mekong River, Vietnam also faces the consequences of climate change and sea level rise in the dry season: "this with climate change has a double impact on the whole Mekong Delta, climax is in saline intrusion in 2016 and widespread landslides"[3]. This has transformed the social life of people in the Mekong Delta.

According to report of the Mekong River Commission, if all three hydropower projects of Laos (Xayabury, Don Sahong, Pak Beng) put into operation, saline intrusion on Tien and Hau rivers penetrates 2,8-3,8km; If the chain of 11 hydroelectric dams put into operation, saline intrusion in Tien and Hau rivers will penetrate from 10-18km [9]. According to calculation of the authorities, when the salinity exceeds 10/00, the water source cannot be used for living, if it exceeds 40/00, trees cannot grow and die. In fact, there were some times in some localities of the Mekong Delta, salinity was up to 40/00, even up to 200/00; in 2016, saline intrusion was 135km of depth in Vam Co Tay River, 79km of depth on Tien River, 78km of depth on Ham Luong River, 81km of depth on Co Chien River [4].

Research results of Associate Professor, Dr. Le Anh Tuan, Deputy Director of Institute of Climate Change, Can Tho University said: "In term of essence, the Mekong Delta is formed by the Mekong alluvium. This land will be slumped when there is no alluvium. The climate change will happen faster, more serious when hydroelectric dams in turn block the mainstream of the Mekong" [10] and according to *the research on impact of hydropower projects on Vietnam's mainstream* (implemented in the period of 2013-2015) The impact of China's hydropower projects (phase I) on the Mekong Delta in Vietnam is huge: the total amount of alluvium, mud and sand flowing in Tan Chau and Chau Doc drops from 73 million tons/year to 42 million tons (decrease of 42%); the amount of suspended alluvium is only about 30 million tons/year (decrease of 35%); the amount of sand and mud at the bottom is only about 12 million tons/year (decrease of 54%). Moreover, if summing up the impact of China's hydropower projects with 11 hydropower projects on the Mekong mainstream, the total amount of alluvium in Tan Chau and Chau Doc will be reduced to about 15 million tons (decrease of 80% compared to conditions before appearance of Chinese hydropower projects and additional decrease of 65% after their appearance) [11]. This led to the collapse of many houses in the Mekong Delta, causing loss of house, and forcing people migrate to other places.

According to report of the Ministry of Agriculture and Rural Development by January 2019, the Mekong River Delta had 562 locations of landslides for river and sea coast with a length of 786km, in which localities had many dangerous landslides including Ca Mau, An Giang, Dong Thap and Can Tho provinces. Only in 2018, landslides have collapsed people's houses (136 houses in Ca Mau, 53 houses in Can Tho) [12].

> "Most cases of home loss due to landslides are poor households. They have no productive land so they have to build houses along the river, leaning against the forest and live by catching crabs, oysters and they always on the state of readiness for the risk of landslides at any time with insecure, worried feelings".
>
> *(Source: In-depth interview for officials of Lam Hai commune, Nam Can district, Ca Mau)*
>
> "Although I know I'm betting on death when living in a dangerous area, but I do not where I should go when my entires houses, properties, and livelihoods are here" *(In-depth interview for officials of Lam Hai commune, Nam Can district, Ca Mau)*

In addition, the dams will prevent movement of sediment and alluvium, causing damage to agriculture and fisheries on the downstream. According to Dr Naruepon Sukumasvin, Secretariat of the Mekong River Commission: "Projects of hydropower projects make the threshold of poverty increase", "The output of fishing in the Mekong corridor decreases by about 1,57 billion USD", The amount of fishes in the Mekong River decreased, so did weight of fish and the number of big fishes, about 60% of migratory species. Vietnam's export of siluriformes valued billions of dollar is threatened because it depends on food sources as migrating

white fish [11]. Regarding only white fishes, the loss of in the Mekong Delta are around 240.000-480.000 tons/year, ie about from 500.000 to 1 billion USD/year. Meanwhile, the Mekong basin is 65% white fish, 35% black fish. Black fish eat white fish to survive, so the decline of white fish also leads to the decline of black fish [11].

The impacts mentioned above make people unable to live on mangrove fields, to exploit in the aquatic exhausted river and it is difficult to live in houses with risk of landslides, which has impacts on the social issues of people in this area.

3.2. International Cooperation in the Issue of Security for Water Source of Mekong River in Vietnam with Relevant Countries

Recognizing the importance of the Mekong for regional and national development in the future, even in the mid-twentieth century, the countries in the Mekong basin system have cooperated and agreed to efficiently and sustainably exploit this international river. On 17/9/1957, the Mekong River Commission was established. Undergoing many changes, in 1995, four countries on the downstream of the Mekong River (Thailand, Laos, Cambodia, and Vietnam) reached an important agreement on the cooperation mechanism on the Mekong River. On 5/4/1995, government representatives of four countries signed the "Agreement on the Sustainable Development Cooperation of the Mekong River Basin" (Mekong Agreement 1995). Along with that, the International Mekong River Commission (MRC) was established. The two countries on the upstream of the Mekong, including China and Myanmar do not participate in the MRC, it is the dialogue partnership of the MRC. China currenty upgraded its relationship from "dialogue partner" to "observer". The MRC is responsible for promoting, supporting, cooperating and coordinating the cooperation in the potential development for sustainable benefits of the countries along the river and preventing wasteful use of water in the Mekong basin. One of the important issues mentioned in the Mekong Agreement 1995 is the Procerdurers for Notification, Prior Consultation and Agreement mechanism (Procerdurers for Notification, Prior Consultation and Agreement – PNPCA mechanism). Accordingly, it is imperative that Member States must notify the Unite Committee of the MRC when they participate in any infrastructure development project on the mainstream of the Mekong River (for tributaries, only Notification is required, no need for Prior Consultation). The members will conduct an appraisal and evaluate impacts to reach agreement (Agreement) whether the project should be implemented or not, if yes, propose the conditions attached.

The beginning event for the PNPCA mechanism was carried out in September 2010, the MRC received a proposal from Laos to develop the hydropower project on the mainstream of Mekong River in Xayabury province to follow the PNPCA mechanism. After receiving the proposal from Laos, the MRC has actively promoted the consultation process in its member states. Accordingly, Vietnam has collaborated with Thailand and Cambodia to organize national and regional meetings and seminars to assess impact of the project on the sustainable development of basin area. Through international cooperation, MRC emphasized the importance of cooperation and sharing of water resources in the Mekong River basin. At the same time, the process of prior consultation showed the serious impacts of the Xayabury hydroelectric dam project. The countries including Vietnam, Thailand and Cambodia have protested to this project; Moreover, international organizations and communities are strongly opposed to the project of Laos. However, Laos still carries out implementation of the project as planned.

For the construction of the Don Sahong[3] project, Laos agreed to implement the Prior Consultation process (taking place from July 25, 2014). On January 28, 2015, the Joint Committee of the Mekong River Commission held a special meeting to evaluate the results of the 06-month implementation period. The Vietnamese, Cambodian and Thai delegations suggested that more time for further research and evaluation of the works be needed, especially a more detailed assessment of transboundary impacts, flow, fishery and sediment impacts, effectiveness of the mitigation measures proposed by the project owner. However, the Lao side believes that the previous consultation process has ended, and from that point on, Laos can proceed with the project without further notice based on its sovereignty in the development of natural resources of its territory following the principles of fair, reasonable and transparent use as set out in the 1995 Mekong Agreement. When implementing the Prior Consultation for the Xayabury and Don Sahong hydropower projects, the documents that Laos sent to the MRC and member countries are often sketchy, lack of information, with unreasonable design that has a great impact on the lower basin, etc. The countries in the MRC have asked Laos to supplement information to assess the impact and take appropriate mitigation measures. However, many proposals which have not been accepted and implemented by the Lao side are still considered to be completed in regarding procedure of construction consultation and deployment [13]. In addition, Laos has continued to deploy the PakBeng hydropower project and announced the construction of the fourth Pak Lay hydropower dam.

Since its inception, the MRC has held several high-level conferences to build a sustainable Mekong River basin in the context of globalization, such as: The First Conference held in Hua Hin, Thailand on April 5, 2010, the second MRC Conference held in Ho Chi Minh City, Vietnam on April 5, 2014. The conference also affirmed the operation of the MRC as "strengthening the Commission's cooperation with dialogue partners, development partners, regional and international initiatives, social organizations, private sector

3 Don Sahong Hydropower is a hydropower project built on a tributary of the Mekong River in the Siphandon area of Champasak Province, Southern Laos.

and other stakeholders" [5]. Since 2011, MRC has adopted a Basin Development Strategy based on integrated water resource management for the Lower Mekong Basin (2011-2015), to meet the requirement of "a basin development plan to identify, classify and prioritize projects and programs to support and implement at the basin level" [14]. In 2016, MRC continued to adopt a Basin Development Strategy based on integrated water resources management for the Lower Mekong Basin (2016-2020 period). This strategy identifies the mission of the MRC to promote and collaborate on sustainable development and management of the Mekong River's relevant water resources and resources for the common good and the safety of the people in the member countries. The vision of this Strategy also identifies two important areas: member countries implement effectively and strictly PNPCA procedures; At the same time, it is necessary to have effective dialogue and cooperation on water management among member countries and other stakeholders in the basin.

Regarding the international cooperation on water security, Mekong River also has Greater Mekong Subregion (GMS) with the participation of 6 countries sharing the Mekong River. However, the cooperation mechanism of this organization only prioritizes the development of infrastructure, energy, telecommunications, tourism, trade and investment, human resource development, etc. This organization does not have many activities related to ensuring water security in the Mekong River.

Although there are many differences, but the vital benefits to the Mekong River has placed international cooperation requirements among related countries. Recently, Vietnam has been active in international cooperation on this issue and has achieved certain results. In 2016, the Mekong Delta suffered the most severe drought and saline intrusion in the past 90 years, causing a water shortage in the basin by 20-50% compared to the average for many years. Through diplomacy, Vietnam has asked the Chinese side to increase the discharge of water downstream, which has been approved by China and, and allowed to discharge continuously for nearly a month, contributing to the settlement of the Mekong Delta. [6].

On March 23, 2016, the first Mekong-Lancang Cooperation Summit took place in Hainan, China under the theme "Six countries - A community with common destiny: Establishing a dialogue mechanism cooperation on Mekong river - Lancang river, promoting sustainable development of the subregion". The Summit has made many important statements contributing to promoting international cooperation on the use of Mekong River more substantially. As a result of this Summit, Vietnam agreed to cooperate with China in developing a joint project on the establishment of the Mekong - Lancang Water Resources Cooperation Center to share information and improve capacity for sustainable management of water resources, of which Vietnam is willing to make financial and expert contributions to this Center.

In addition, to ensure national interests in the use of water resources, in August 2014, Vietnam joined the United Nations Convention on the use of international water sources for non-navigational purposes. This Convention regulates quite comprehensively the relations between upstream and downstream countries in the use of inter-country water sources, ensuring fairness, rationality, and performance of obligations, which do not cause significant harm to relevant countries. When countries accede to this Convention, this can be considered as a common standard in the exploitation of the Mekong River.

4. Discussing Research Results

From the actual study of the impact of the Mekong River water sources on Vietnam's national security, the research team raised a number of issues in international cooperation to ensure the security of Mekong River water sources for Vietnam as follows:

First, The fact that MRC addressed the relationship between countries sharing the Mekong River to strengthen the cooperation between MRC and dialogue partners, development partners have shown international relations in issue of Mekong River needs to be expanded beyond the four MRC member countries. This is explained that the MRC only fulfilling its goals with the consensus of two upstream countries is China and Myanmar. Therefore, promoting cooperation with these two countries is essential.

Secondly, the explanation for strengthening control of water resources management in the Mekong River is that exploiting benefits from the Mekong River according to the advantages of each country is an inevitable trend. Therefore, the Mekong River lies within the development strategy of the countries sharing the river. However, the advantages of each country on this issue are different, so it can be dominated and controlled by the country with more advantages. *For China*, it is estimated that by 2025 and 2030, China will have a shortage of fresh water and electric power [15]. Therefore, exploiting water resources and hydropower potential from the Mekong River is one of the top priorities for China to overcome this. Moreover, with the advantage of geography, the Mekong River part of China has created favorable conditions for China to reach a great deal of benefits in international relations with the Mekong subregion countries. In fact, China has actively participated in GMS and moved from a dialogue partner to an MRC supervisor. In this way, China is taking full advantage of all the mechanisms to achieve its benefits: both achieving economic benefits and not being constrained to ensure water security, while governing the countries involved through these mechanisms. China participates in the GMS so that it will not be considered regarding the issue of flow because this mechanism only focuses on trade issues between countries and infrastructure development; China participating as a MRC observer so it will also not considered for the flow of the Mekong because China is not a member. With policies and practical actions over time, China has restricted the ability of MRC to operate and turned the control of water resources in this river into a "weapon" to threaten national

security of the remaining countries. China even announced that it had reached an agreement with Thailand, Laos and Myanmar to strengthen waterway transport in the dialogue outside the MRC framework.

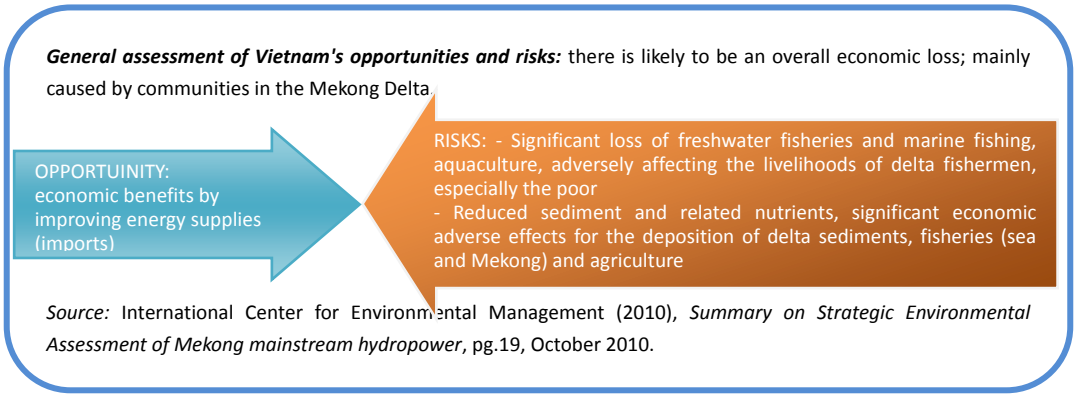
For Laos, it will benefit greatly when hydropower dams are operated. Laos can export electricity abroad, while increasing irrigation and agricultural productivity in some areas, improving the capacity of larger vessels. For Thailand, there will also be an opportunity to solve energy problems for economic development, improve circulation conditions for large vessels. For Cambodia, completed hydropower dam projects will increase economic resources, expand irrigation and labor productivity in some areas. For Vietnam, the country at the bottom of the Mekong River basin is also the only country without hydropower on the mainstream of the Mekong River, and has been affected by climate change, causing sea level rise to create two "pincers" with strong impacts on Vietnam. Therefore, in addressing the Mekong River problem contributing to ensuring national security, Vietnam has the most disadvantages and suffers the most losses.

Thirdly, the research results show that the effectiveness of international cooperation on the water resources of the Mekong River in the past time is limited, even though it has just stopped at the political statements. The fact that Laos built the Xayabury hydropower dam despite opposition from MRC members has set a bad precedent for cooperation on this issue. This is explained by the great benefits that Laos receives when implementing this project. According to a report by the Institute of Sustainable Solutions at Portland University, USA in collaboration with Mae Fah Luang University, Thailand, for all the scenarios for developing the Mekong River basin and Laos are always the countries with the most benefits compared with other countries in the MRC. One important reason for this is that the PNPCA mechanism is still lax and non-binding. With the Notice and Prior Consultation process, the Agreement only requires the parties to Notify and Consult in advance of the mainstream dam project with a period of 6 months that whether the agreement is reached or not, the consultee will still proceed with the construction. This mechanism does not bind members to reach agreement, the previously consulted country does not have the veto to request a stop. In fact, over the past time, the MRC Joint Committee continuously has to extend the previous Consultation period so that MRC and its member countries fully evaluate the impacts and study measures to minimize environmental impacts of the projects. This regular extension may cause stress and rift in the MRC for the countries proposing the projects states that member countries do not support or prevent the economic development of their country. Therefore, it is necessary to revise and increase the time for the Prior Consultation, both to ensure the time for full evaluation of impacts and to provide solutions to minimize the environmental impact of the projects, while ensuring diplomatic and solidarity requirements in the region. However, the process of revising the Agreement needs to be careful and have an appropriate roadmap, because if not carefully calculated, countries will include in the Agreement contents to protect their interests. Not harmonizing differences (possibly with external intervention to intentionally create tensions) creates a risk of breaking the Agreement, causing disadvantages for downstream countries, especially Vietnam. If the adjustment period of the Agreement is extended, it will be an opportunity for countries to "enlist" to massively build hydropower projects without consulting MRC members. Besides, it also shows that the failure of Laos to fully comply with the PNPCA mechanism has created a bad precedent, which is the trigger for a series of other hydropower projects in the consultation process or in the construction plan. It is estimated that by 2030 there will be hundreds of dam projects built on the mainstream and tributaries of the Mekong. Moreover, China's development of hydropower dam strategy has provided momentum for the construction of dams in downstream countries. In the case of Laos, for example, it is difficult to ask Laos to stop building hydropower dams while the upstream country has been massively building hydropower dams. Moreover, so far, up to 40% of hydropower development projects on the mainstream and tributaries of the Mekong River are invested by Chinese companies. [16].

Up to now, Laos has a strong determination to build hydropower plants. If the concerned countries insist on preventing Laos, it will adversely affect close relations between countries, causing a split of solidarity between the countries downstream of the Mekong. Meanwhile, Vietnam's continued participation in the construction of Luong Pha Bang (Laos) project will partly help Vietnam in the regulation of the shared water resources, but that means accepting Laos to implement other hydropower projects on the mainstream of the Mekong River, causing serious impacts on the Mekong Delta. If Vietnam does not participate in implementing this hydropower project, it will be an opportunity for other investors to replace and control almost all upstream water resources.

Forthly, despite being able to influence and dominate water security, upstream countries still participate in cooperation, sharing and meeting the requirements of some downstream countries on the issue of the Mekong River, such as China with the approval of discharging water at the request of Vietnam, from the "dialogue partner" of the MRC to the "observer", agreeing to the policy of sharing information on the dams, etc. This is explained by the increasing demand for international relationship with close cooperation. Excessive construction of hydropower dams not only has consequences for downstream countries but also harms the host country. Meanwhile, China is also in need of taking advantage of countries sharing the Mekong River to develop the country. Another reason for this problem is that the ASEAN community born in 2015, especially with the economic pillar, has required countries to cooperate and share resources for economic development, including exploitation and use of water resources of Mekong river.

This shows that the current international integration context has forced upstream Mekong countries to participate in information sharing and dialogue with the rest of the countries sharing the Mekong river. Therefore, for international cooperation in the security of water resources in the Mekong River, despite being impossible to apply the PNPCA procedure as MRC members for the dialogue partner countries, the principles of information sharing, dialogue and monitoring remain the basis for MRC's relationship with its dialogue partners, especially China.



5. Conclusions and Recommendations

Water security in the Mekong River is a very important factor for Vietnam to ensure food security and human security in this area, as a part of ensuring the national security protection potential for Vietnam. At the same time, this issue is also identified as a factor that can cause complications, or conflicts between the countries concerned. However, given the current international and regional context, countries that share the Mekong River participating in many regional and international cooperation mechanisms, bilateral and multilateral relations also require the countries to work closely together to solve many problems.

Countries that share the Mekong River are using this river according to their interests, with their own strategies and exploitation plans. The impact of each country on this river has implications for other countries. Meanwhile, upstream countries with many advantages have taken full advantage to exploit for the purpose of their socio-economic development, even use these to threaten national security and dominate other countries in international relations. And the countries downstream have suffered the most severe consequences. Although countries have cooperated and shared to exploit and use, there are still many differences in benefits so it has not achieved much results. Moreover, in the future, increasing demand for electricity, fisheries and irrigation for agriculture may lead to conflicts. Therefore, water security is still a great risk to the national security of the countries concerned, including Vietnam.

From the above research results, the research team recommends some issues in international cooperation to ensure water security in the Mekong River as follows:

First, it is necessary to continue and strengthen international cooperation on the Mekong River through the PNPCA mechanism in the MRC framework and cooperation within the GMS framework. It is necessary to promote the role of MRC, increasing the conncection among member countries. There is a need to continue the struggle to revise the PNPCA process towards greater consensus and the need for consultation of the communities living in the Mekong River corridor, increasing the time for Prior Consultation. At the same time, it is necessary to develop negotiation plans, dealing with situations of countries taking advantage of amendments and supplements to find ways to break or withdraw from the Agreement. On the one hand, there is a need to strengthen the six-party contact between the countries of the Mekong River to bring the two upstream countries into the MRC mechanism.

Secondly, it is necessary to improve the operational capacity of the Mekong River Commission of Vietnam to meet the ability to work closely in all activities of the MRC in order to promptly consult the Government in making appropriate foreign policy to solve the Mekong River problems. The national security task force of Vietnam needs to study the Mekong mainstream hydropower projects, the impact of Laos on seriously implementing a high-level agreement between the two countries on this issue.

Thirdly, strengthening countries to implement agreements on information exchange and data sharing on the use of the Mekong River. If these agreements and commitments are taken seriously, it will contribute greatly to ensuring the security of the Mekong River water resources. At the same time, Vietnam needs to promote the establishment of the Mekong - Lancang Water Resources Cooperation Center in the future.

Vietnam continues to actively mobilize relevant countries to join the UN Convention on the use of international water resources for non-navigation purposes (1997) to use the document as an important basis in exploiting and using the Mekong River. At the same time, strengthening the form of people's diplomacy, actively exchanging experiences and propagating the impacts of the Mekong River to the people of countries living along the Mekong River in order to create a common voice and action among the people.

Forthly, strengthen international cooperation on the application of science and technology in the response to climate change, sea level rise, water resource regeneration, treatment of water pollution, prevention of saltwater intrusion, urban construction planning. Vietnam should soon complete the study to assess the impact of hydropower dams as a basis for international cooperation with Laos in the construction of hydropower projects in the mainstream of the Mekong to limit negative impacts on the lower regions, including in the Mekong Delta of Vietnam. Actively coordinating research and calculation to choose the most reasonable scenario (both restricting negativity to the downstream area including the Mekong Delta, and not affecting the economic development of Laos) to negotiate with countries in the international Mekong River Commission.

Fifthly, continue to study the plan to "join in" with Laos to build hydropower projects on the Mekong River (directly invest or "help" Laos technically ...) to actively participate in the design of dams, offering options to minimize the impact of hydropower projects. In this case, Vietnamese investors need to strictly comply with the provisions of the 1995 Mekong Agreement, fully evaluate and implement measures to minimize the environmental impact of this hydropower project. If the Vietnamese investors do well, they will actively support international cooperation to protect the Mekong Delta from the impact of the upstream Mekong hydropower, considering it a "model project" for other investors when investing in construction on the Mekong mainstream to ensure harmony between economic development and environmental protection, the interests of countries in the Mekong basin.

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