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Master's Thesis of Public Administration

**Review on the Implementation
of the Policy on Sustainable Hydropower
Development of the Government of Laos**

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Abstract

Review on the Implementation of the Policy on Sustainable Hydropower Development of the Government of Laos

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This research reviewed the implementation of the Policy on Sustainable Hydropower Development (PSHD) of the Government of Laos (GOL). It was an exploratory research which focused on reviewing the formation, adoption and implementation in the policy life cycle only. Thus, it was not the full evaluation of PSHD. This research used qualitative data of which the primary data was collected from virtual interviews with the relevant staff of key authorities and some hydropower projects in Laos and secondary data from the laws, regulations, reports and other relevant documents.

The findings illustrated that the GOL wanted to develop hydropower to be an export commodity and to supply the domestic demand by promoting investments of

individuals and entities into hydropower development projects which could ensure watershed protection, consistency with the national socio-economic development plans, safe, economic and sustainable operation and effective impact mitigation. Initially, the GOL established the National Policy on Environment and Social Sustainability of Hydropower Sector in Lao PDR (NPSH) in 2005. NPSH was revised during 2013 to 2014 to cover the technical, environmental and social aspects. Therefore, the name of the policy was changed to the Policy on Sustainable Hydropower Development (PSHD) in 2015.

PSHD has allowed development of hydropower projects as a type of business which applies the independent power producer (IPP) model. The beginning of this model is that the entities submit their project development proposals to the concerned authorities. Once approved, the entities conduct development and related business activities of the projects under a concession right to build, own, operate and transfer the projects to the GOL after the end of the concession right which is legally binding and stipulated in an agreement called the concession agreement (CA). The development activities are conducted through 4 stages (planning, construction, operation and transfer stages). Each stage requires completion of its specific activities in order to advance to the next stage.

PSHD increased sharply the generation capacity from 30 MW to almost 10,000 MW and the household electrification from 3% to 95% from 1971 to 2019. It also turned electricity as the national export commodity and there have more projects under construction and planning stages.

The research also found many issues and challenges for PSHD implementation. For example, the domestic supply project developers could not pay their financial obligations to the GOL because EDL (a state-owned enterprise which is the sole

distributor of electricity for the domestic consumption) could pay only a minor part of the electricity costs to the developers; there were also some international communities which disagreed with many hydropower development projects in Laos; and law enforcement was not strong enough. Thus, the continuation of PSHD must be in parallel with measures to tackle the issues and challenges.

Keyword : Concession Agreement, Concerned Authority, Developer, Power Purchase Agreement, Project Development Agreement, Memorandum of Understanding

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Acronyms

AFD	Agence Francaise de Developpement
BD	Basic Design
CA	Concession Agreement
EDL	Electricite du Laos
ESIA	Environmental and Social Impact Assessment
FDI	Foreign Direct Investment
FFS	Final Feasibility Study
FS	Feasibility Study
GMS	Greater Mekong Sub-region
GOL	Government of Laos
Lao PDR	Lao People’s Democratic Republic
LPRP	Lao People’s Revolutionary Party
MAF	Ministry of Agriculture and Forestry
MEM	Ministry of Energy and Mines
MONRE	Ministry of Natural Resources and Environment
MOU	Memorandum of Understanding
MPI	Ministry of Planning and Investment
NPSH	National Policy on Environment and Social Sustainability of Hydropower Sector
PDA	Project Development Agreement
PFS	Preliminary Feasibility Study
PPA	Power Purchase Agreement
PSHD	Policy on Sustainable Hydropower Development

Chapter 1. Introduction

1.1. Background

1.1.1. Favorable Conditions for Hydropower Development

Laos, a land-locked country in the Indochina Peninsula, has a suitable location and geographical condition for hydropower development because it is located in the rainforest part of South-East Asia, which provides rainfall of about 4,200 ml to 5,200 ml (Mekong River Commission, 2022). The national total area is 236,800 km², of which 85% is covered by mountains and more than 72% is covered by forests (National Statistics Bureau, 2021). These conditions create catchment areas, rivers and terrains which are favorable for constructing hydropower dams and they give Laos the potential for developing hydropower of 26,000 MW (Department of Energy Policy and Planning, 2021).

In addition, the neighboring countries of Laos, such Thailand, Vietnam, Cambodia, Malaysia, Singapore and Myanmar, have experienced strong economic growth which demand for electricity. Therefore, the hydropower development in Laos will not only supply the domestic demand but also export to the neighbors.

As a result, the Government of Laos (GOL) has integrated the hydropower development projects in the national development plans since 1986. However, to realize development of these projects could never be easy due to its strategic location and geopolitical position to the global major powers which have always been alert to insert their influences in Laos.

1.1.2. Geopolitical Implication

1.1.2.1. Strategic Location

Being located in the center of the Indochina Peninsula has put Laos in the strategic and geopolitical position of the superpowers. This position has also put the country at the center of the attention of the superpowers which became obvious during the Cold War which the USA with its allies operated a covert war by backing the government of the Kingdom of Laos to fight against the Pathet Lao movement led by the Lao People's Revolutionary Party and supported by the North Vietnam and the Soviet Union, from 1955 to 1973 (Anthony, Sexton, 1993).

Its hydropower development policy is also not an exception even though it is environmentally friendly and for the national development and prosperity of its people. Hydropower development requires not only the natural resources of Laos, but also a lot of financial capital. Based on the data of hydropower project costs gathered by the Department of Energy Business, Ministry of Energy and Mines, the unit cost of a hydropower development project in Laos is approximately USD 1.5 million to 2.5 million per MW. In contrast, Laos was one of the poorest nations in the world.

After the uprising of the Lao people under the leadership of the Lao People's Revolutionary Party (LPRP) to overthrow the monarchy and the royal government of the Kingdom of Laos backed by the United States of America (Sander, 2014) and the establishment of the Lao People's Democratic Republic (Lao PDR) on December 2, 1975 (Wikipedia, 2022), the country faced an economic turmoil due to the closure of borders with the Western allies. This situation turned Laos into one of the poorest countries in the world by that time.

The hydropower development in Laos also had the concern of its neighboring countries because 90 percent of the total area of Laos is a big portion of the catchment area of the Mekong River and accounts for more than 45 percent of the Greater Mekong Sub-region (GMS) (Mekong River Commission, 2022), playing a very significant role in catching and storing the annual rainfall for economic activities of the region, such as agriculture, fishery, aquaculture and tourism. The neighboring countries expressed their concern that Laos would control the natural flow of the Mekong and its tributaries, the sediment and fish migration and the regional navigation along the river. To address this concern, Laos entered into the Mekong Agreement with Vietnam, Thailand and Cambodia in 1995. According to this agreement, Laos is obliged to inform and consult with the parties if Laos wants to build any hydropower projects on the mainstream of the Mekong before starting construction, and inform the parties if Laos wants to build any hydropower projects on the tributaries of the Mekong.

1.1.2.2. Influence from the West in relation to PSHD

With the desire by LPRP to materialize the hydropower development policy, Laos needed financial and technical means from the developed countries. However, with the collapse of the Soviet Union and Laos' communist allies in Eastern Europe, Laos needed to improve its relation with the USA and other USA's allies. Nonetheless, LPRP never gave up its effort to realize the hydropower development plan as the promising path to increase the Lao economy, jobs and income of the Lao people and to proof that the Party is capable of leading the country. In 1986, LPRP started its friendly foreign policy toward the Western allies and open the country for greater access by the outsiders (U.S Department of State, 2016). As a result, major Western countries such the USA, Australia, Japan and some European countries

established diplomat relations with Laos again in the 1990s. In addition, the GOL has strongly promoted the participation of the private sector into the hydropower development and other industries by through various means such establishment of the Law on Investment Promotion in 1986 and the investment promotion committees at central and local levels.

The governments of the Western allies such as the USA, France, Japan, Norway, South Korea and Thailand began to allow their investors to engage with the GOL for conducting feasibility study on various hydropower development projects, such as Nam Theun 2, Huay Ho, Theun-Hinboun, Nam Ngiep 1. The Western allies also allowed its financial institutes, with the World Bank, ADB and major Thai banks, to lend credits to the GOL for its own hydropower development projects such as Nam Leuk 3, Xeset 1, Xeset 2. In 1987, ADB provided grant and loan to GOL for development of Xeset 1 Hydropower Project (ADB, 1987).

The promotion efforts and means were on the way to the success and saw the first Public Private Partnership (PPP) hydropower project, namely Theun-Hinboun Hydropower Project, which started construction in 1994 and operation in 1998, selling electricity to Thailand (Theun-Hinboun Hydropower Company Limited, 2022). The Lao government holds 60% shares and the rest belong to the private entities in the USA and Norway. Another PPP hydropower project was Huay Ho which began its operation in 1999, selling electricity to Thailand as well (Huay Ho Hydropower Company Limited, 2022). The Lao government shares 20% and the rest belongs to the private entities in South Korea and Thailand. The hydropower projects such as Nam Leuk 3, Xeset 1, Xeset 2 were fully developed by the GOL and financed by the loans from the financial institutes in the Western countries and started operation to supply domestic consumption in the early 2000. For example,

according to ADB's Report and Recommendation of the President in 1987, Xeset 1 Hydropower Project received grant and loan from ADB.

With the success of the presence of the Western influence in the hydropower sector, it also came with risk of fulfilling the requirements by the West which the GOL had to fulfill although they were not in the GOL favor (Department of Energy Business, 2013). For instance, Nam Theun 2 Hydropower Project was the biggest and the most controversial PPP hydropower project with the project cost of USD 1.45 billion (Nam Theun 2 Power Company Limited, 2022).

The GOL was very eager for Nam Theun 2 Hydropower Project as it saw the successful development of this project to pave the way for attracting more investors into the hydropower development sector. To gain the support and address the concern of the World Bank, the investors from France, Japan and Thailand, the potential lenders and the importer in Thailand, the GOL had to establish Law on Water in 1996, Law on Electricity in 1997, Law on Environmental Protection in 1999 and other secondary regulations using the Western standards which were quite high (Phomsoupha, Department of Energy Business, 2012).

The GOL and the investors completed the planning stage of Nam Theun 2 successfully and executed the concession agreement (CA) in 2002 and ready to finalize the power purchase agreement with the off-taker and the financing agreement with the potential lenders. However, there were protests against the development by environmentalists and NGOs in some European countries and the USA who demanded the World Bank, the lenders and the developer to withdraw from the project (Samabuddhi, 2005). As a result, the World Bank, the lenders and the developer signaled to leave the project.

This situation forced the GOL to sacrifice more. For example, in a workshop

held in Luang Prabang in 2013, the Department of Energy Business stated that the GOL had to accept the condition that it would spend all revenue received by the GOL from Nam Theun 2 on rural development activities only. This means that the GOL cannot use such revenue on any other activities no matter how important they are for the country. After that the World Bank, the lenders and the developer came back in and finalized and made all relevant agreements for the project development and the construction began in April 2005 and the operation in April 2010. Nam Theun 2 sells 95% of power output to Thailand and 5% domestically (Phomsoupha, 2012). The GOL shares 15% in the project and its equity contribution came from the loans from ADB, European Investment and Agence Francaise de Developpement (AFD) (Phomsoupha, 2012).

In addition, Department of Energy Business (2013) stated that the lenders and the investors want to ensure that their projects could yield high return to their investments, so they request for exemptions from certain obligations and from paying full rates of taxes. Because the GOL needed electricity for export and domestic supply, the GOL wanted to have the projects for free after the end of the development rights of the developers, the GOL, on case-by-case basis, used its utmost efforts to identify any necessary exemptions which could be provided to the developers.

1.1.2.3. Influence from China and Vietnam in PSHD

Seeing that Laos moved closer and closer toward the West, China and Vietnam started to enter the hydropower development sector in Laos in early 2000 to prevent the expansion of the development of hydropower projects by the Western countries into their border areas with Laos.

It can be assumed that the presence of the Chinese entities in the hydropower

development sector in Laos was likely driven by the Chinese geopolitical interest (Guerreiro, 2021). One reason to support this assumption is because the information from the Department of Energy Business in 2022 showed clearly that most of the project sites selected by the Chinese investors are located in the northern part of Laos, including the sites on the Mekong River. Another reason is that Chinese developers did not invest in their projects for export electricity to China but for domestic supply despite the small demand and low price by the Lao market which could not make the projects technically and economically viable. It is also important to note that the Chinese investors were very patient and can delay the development of their projects and incurred necessary expenses to keep their projects alive and await until the Lao market is ready for their projects.

Chinese banks also participated to finance the projects which they have more domination with long-term loans (Albert, 2019). Interestingly, Chinese banks also provided huge amount of loans to some Lao investors to develop hydropower projects even though the Lao investors have insufficient credit rating or assets to secure their liability and little experiences of hydropower.

On the other hand, the presence of Vietnamese entities in the hydropower development sector in Laos was also to serve the geopolitical and security interests of the Vietnamese government. Similar to the Chinese investors, the information from the Department of Energy Business shows clearly that most of the project sites selected by the Vietnamese investors are located in the eastern part of Laos. Unlike the Chinese developers, however, the Vietnamese developers invested in their projects for export electricity to Vietnam even though the off-taker in Vietnam would pay low price. The information from the Department of Energy Business also indicates that the Vietnamese investors relied on loans from Vietnamese banks,

especially the Vietnamese government banks, to finance their projects. Although development cost of the hydropower projects was high in Laos, these banks were still willing to extract their utmost credits to lend to the Vietnamese developers.

The Chinese and Vietnamese developers had also influenced the direction of the policy on hydropower development of the GOL. Previously, the GOL was more familiar with the development of hydropower projects for exporting electricity to Thailand which were technically and financially viable and could produce high return rates. However, most of the hydropower projects developed by the Chinese and Vietnamese developers do not yield high return. Due to the reason that the GOL needed electricity to supply the domestic demand, the GOL wanted to have the transfer of the projects free of charge after the end of the development rights from the developers and the GOL had to balance and maintain its long term-term relations with China and Vietnam, therefore, the GOL had to make the projects viable. To do that, and on case-by-case basis, the GOL used its utmost efforts to identify any necessary exemptions to the developers from minor activities, obligations and from paying full rates taxes and fees, in order to reduce the project costs and increase the return rate of the projects (Department of Energy Business, 2013).

With the flexibility of the GOL on this early version of the hydropower development policy, more and more Chinese and Vietnamese entities came to invest in the hydropower development sector from 2000 to 2005. The data of the Department of Energy Business shows that the hydropower projects of Chinese developers account for 50% of the total number of projects and the projects of Vietnamese developers share approximately 15%.

1.1.2.4. The Western Response to the Increase of the Chinese Investors

The increase in the number of the hydropower projects under the Chinese

development posted concern on the USA and its Western allies. In response, the USA increased the presence of USAID with the GOL. The World Bank and IFC became more active to provide technical assistance to the GOL agencies to improve the capacity of the agencies to better enforce compliance with the laws and regulations related to environmental protection and electricity, to improve these laws and regulations and institutional arrangement related to environmental protection and hydropower (U.S Department of State, 2016). The Department of Forestry reported in 2022 that the World Bank and the international organizations in the major EU countries also provided more financial and technical assistance to protect key national protected areas of Laos from 2008 under REDD+ (Reduce Emissions from Deforestation and Forest Degradation) program.

1.1.3. Forming a Stronger Hydropower Development Policy

According to the Guideline on Implementation of the Policy on Sustainable Hydropower Development issued by Ministry of Energy and Mines in 2016, the early policy on hydropower development of the GOL brought huge foreign direct investment (FDI) which made up a big proportion in the economy, other development activities and employment. The policy also had the potential to make electricity be the main export commodity and source of national income.

The policy, however, was still premature and had little connection with long-term sustainability. Its focus was usually only on attracting investment, first-come-first-served basis, increase of electricity output for domestic supply and export and taxes collection. The main weakness of the early policy was its unpredictability. It kept changes to adapt to the external influence. In addition, the policy tended to be investor-oriented. The GOL also gained a lot of experiences and found a lot of issues

and challenges from the implementation as well as concerns and influences from different key players in the regions. Therefore, it is important that the GOL develops the policy toward sustainability in all aspects of hydropower project development.

Subsequently, in 2005, a National Policy on Environment and Social Sustainability of Hydropower Sector in Lao PDR (NPSH) was adopted and applied (IFC, 2022). To realize the new policy, during 2006-2014, the GOL established and improved laws, secondary regulations, and institutional frameworks related to the implementation of NPSH which changed the way of exploitation of the hydropower resources in the country. The Guideline on Implementation of the Policy on Sustainable Hydropower Development states that the key laws and regulations include the Amended Law on Electricity in 2012, the Amended Law on Environmental Protection in 2012, the Amended Law on Forest in 2007, the Amended Law on Land in 2003, the Environmental Impact Assessment Decree in 2010, the Ministerial Instruction on Environmental Impact Assessment in December 2013, the Compensation and Resettlement Decree in 2005, the Protection Forest Decree in 2010, the Forestry and Forest Resource Development Fund in 2006.

The guideline also shows that key institutional arrangement includes the establishment of the Ministry of Energy and Mines (MEM) in 2006 and its restructuring in 2011-2012, the establishment of the Water Resources and Environment Agency (WREA) in 2007 and its upgrading to the Ministry of Natural Resources and Environment (MONRE) in 2011-2012 and the re-organization of the Ministry of Agriculture and Forestry (MAF) in 2011-2012. In addition, NPSH was updated with active involvement of the concerned agencies through a series of meetings including consultation workshops with other key international organizations during 2013-2014.

Because the scope of NPSH expanded to cover the technical and engineering aspects as well as the environment and social impacts, the name of the policy was changed to the Policy on Sustainable Hydropower Development (PSHD) in 2015 and adopted by the Prime Minister of Lao PDR under the Decree no. 02/PM, issued on 12 January 2015.

1.2. Problem Statement

Despite the fact that PSHD is the key policy to the success of hydropower development in Laos and it has been in place since 2015, academic review on the implementation of the policy, especially by international perspective has been limited. In addition, the geopolitical situation in Asia-Pacific regions has changed and had important impacts on the policy. Therefore, it is important to review the implementation of the policy to determine whether it has been carried out by both the relevant parties in both the public and private sectors in accordance with its design. In addition, the academic review on the implementation of PSHD is essentially desired as it will help to identify and analyze any issues surrounding the implementation and to investigate any possible solutions to the issues.

1.3. Research Scope

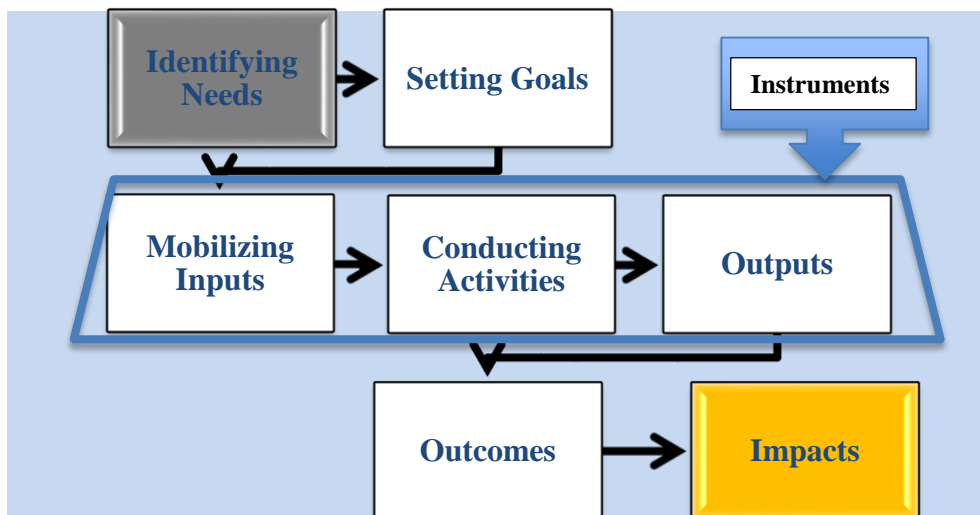
This research reviewed the implementation of the Policy on Sustainable Hydropower Development of the Government of Laos which has Ministry of Energy and Mines as the focal point for the implementation. For this review, there was investigation on why and how the policy was formed and carried out by the relevant parties of both the public and private sectors. The review also looked into and analyzed the implementation of PSHD to identify any issues or challenges and the respective measures to address them.

It is important to note, however, that this review was not a full evaluation of the policy. The findings from this research could not cover any results related evaluation of the policy such as its effectiveness, outcomes and impacts or comparison.

1.4. Research Questions

In order to form the research questions, the author applied the policy theory, policy life cycle and policy evaluation theory. The policy theory is a causal relationship between the policy problems, objectives, instruments and the policy consequences (Lee, 2021). The theory can be in the following model.

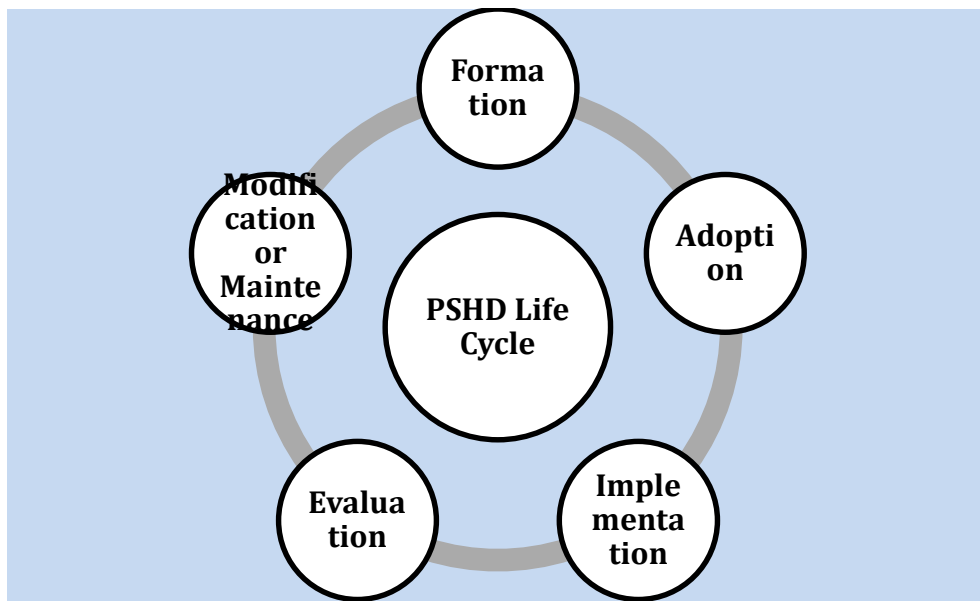
Figure 1: Policy Model



Source: Adopted by the Author from the Lecture of Professor Lee Sukwon, Graduate School of Public Administration in 2021

The policy life cycle theory is a cycle which process the policy through formation, adoption, implementation, evaluation, maintenance and come back to the formation (Harvard Catalyst, 2022).

Figure 2: PSHD Life Cycle



Source: Adopted by the Author from Harvard Catalyst, 2022

According to the life cycle, PSHD was adopted in 2015 and has been implemented since then. Seven years have passed and PSHD could be evaluated in accordance with its cycle. This research can be used as a part of, but not the full evaluation of PSHD. To carry out this research as a part of PSHD evaluation, the author was inspired by the policy evaluation theory which is the process to assess the effectiveness of a policy (Lee, 2021).

The policy evaluation theory involves assessment of different parts of the policy. In a lecture at Graduate School of Public Administration (GSPA) in 2021, Professor Lee Sukwon suggested that when conducting a policy evaluation, the main questions to be answered are (1) what are the nature and scope of the problem requiring the policy, (2) is the policy implemented as designed, (3) is the policy effective, (4) what are the costs relative to its effectiveness and benefits and (5) what are the measurable outcomes?

However, the review from this research focused only on the assessment of the instruments section of the policy or implementation part. Therefore, the main research question was how has PSHD been implemented? Based on the policy theory, this question was designed to explore whether PSHD has been conducted in accordance with its objectives and design by finding the answers to the first two questions in the policy evaluation theories (what are the nature and scope of the problem requiring the policy and is the policy implemented as designed). Therefore, this research investigated and explained (1) why PSHD was established, (2) how has the PSHD been implemented by the concerned authorities and the hydropower project developers and (3) what issues or challenges in the implementation of the policy and what measures or actions were or will be taken in response to the issues or challenges.

1.5. Research Objectives

It should be noted that this research was non-experimental and exploratory. It only aimed to review as part of the evaluation theory to see how the Policy on Sustainable Hydropower Development of the GOL (PSHD) has been carried out, in order to explore and to analyze whether such implementation is in accordance with the objectives and the design of PSHD and to identify any issues or challenges encountered by the implementation and how solve them. However, this research did not attempt to make the full evaluation to pinpoint the effectiveness of PSHD and the relationship between PSHD and its impacts on the hydropower development, energy sector or the economy.

This research also aimed to be an important opportunity to investigate and discuss the implementation issues or challenges encountered by the concerned

authorities and the project developers to the possible solutions. Technically, the results of this research can create and extend the better understanding and knowledge of PSHD among Ministry of Energy and Mines (as the main implementing agency of the policy), the other concerned agencies and the project developers.

Chapter 2. Literature Review

This research assumed the limitation of literatures from fair and reliable sources as expressed in Chapter 1 that academic review on PSHD was very limited. As the research was to review PSHD which has been implemented and improved by the continuing efforts of the Lao government, it is important to form the review based on the fair and reliable academic articles. More importantly, as the Lao government has been seen as a communist government, the author tried to be alert about articles of misinformation or negative and unconstructive attacks on the Lao government and the hydropower development policy. The author used the best efforts to find and review such articles. However, there was no direct articles related to PSHD.

Fortunately, there were quite a number of articles which provide theories or discussed sustainable hydropower development from academic institutes, professions and reliable agencies. Some of these articles were also about the previous researches on the hydropower development sector in Laos which illustrated in general of the hydropower development policy and the issues surrounding the implementation and discussed some solutions.

2.1. Theory about sustainable hydropower development

In order to turn the hydropower sector into a sustainable sector, to maximize the benefits of the hydropower dams beyond its construction costs and to ensure that the dams supply sustainable energy to the systems, careful and thorough assessments and development steps of the hydropower dams must be made as followings. (Moran et al., 2018). Environmental impact assessments (EIAs) and social impact assessments (SIAs) must be made in a responsible manner to be qualified as the basis to pinpoint any possible risks, issues and impacts of the dam

and as the basis to form measures to allow the dams to be built sustainably. EIAs and SIAs must not be conducted by the dam developers, but rather by the independent entities with participation of the local. The designs of hydropower dams must incorporate fish passage facilities and mimic the seasonal river flows. Specific governing system must be set up in the areas surrounding the dams.

Moran et al. (2018) strongly advise that true information of costs, benefits and impacts of the dams (including social, cultural, economic, political, and environmental costs and the costs of dam removal at the end of the dam lifespan) must be transparent with the stakeholders and affected communities. Assessment and evaluation on the sustainability of the dams must be specifically designed and carried out on regular basis during operation period. Where applicable, priority must be given to innovative technologies or measures that can avoid building the dams on rivers or resettling affected communities. (Moran et al., 2018).

Environmental and social aspects play very important parts for the sustainability of hydropower projects. To ensure these aspects, Jusi (2011) suggested that clear institutional arrangement and mandates among the concerned authorities must be established, the dissemination of laws and concerned project documents related to ESIA must reach the right stakeholders, coordination between the concerned authorities involved in natural resources management must be very strong and they must be staffed with competent personnel to effectively carry out their mandates.

In addition, Middleton (2022) raised the importance of EIA and SIA and argued that EIA and SIA must be properly and thoroughly conducted to identify any accumulative impacts. The government authorities and the developer most of the time underestimated these impacts. This resulted to improper EIA and SIA

conducted by the developers and the government authorities failed to account for the cumulative interactions between hydropower projects which created negative impacts on affected people.

The success of EIA and SIA also lies in the livelihood restoration program for the project affected people. Zachau (2015) gave the example of the livelihood restoration program of Nam Theun 2 Hydropower Project. This program was quite a challenge for the Lao government. This program requires improved management of natural resources, agriculture and livestock to ensure their well-being livelihoods; the downstream areas also need continuing support financially and technically into the future; and conservation of watershed or catchment areas of hydropower projects and water quality has not met expectations. (Zachau, 2015).

It is also important to put high attention on the planning stage. Identifying potential sites is crucial before planning to develop hydropower projects for sustainability. The decision makers of the planning and development of hydropower projects must have clear knowledges of the potential sites for the development to prevent poor planning (Dhaubanjari et al., 2021). In addition, the planning must consider carefully, at the early stage of the feasibility study, any geo-technical risks which may impact the hydropower project facilities to be built (Schwanghart, 2018).

2.2. Precedent Study on Hydropower Sector in Laos

2.2.1. Advantages for Hydropower Development Policy in Laos

Laos has a suitable location and geographical condition for hydropower development because it is located in the rainforest part of South-East Asia, which provides rainfall of about 4,200 ml to 5,200 ml. The national total area is 236,800 km², of which 85% is covered by mountains and more than 72% is covered by

forests. These conditions give Laos the potential for developing hydropower. Therefore, the Government of Laos (GOL) envisaged the national objectives which focus on developing hydropower to increase and supply the affordable, reliable and sustainable electricity, to foster its economic and social development and to address its comparative disadvantages in bringing in investments and industries (WRCCS, 2008).

In addition, the first meeting of the Steering Committee of Nam Ou First Phase Hydropower Project, on the 3rd of May, 2013 in Luang Prabang Province, Mr. Xaypaseuth Phomsoupha, Director General of Department of Energy Business of Ministry of Energy and Mines informed the meeting that the Lao government aimed to develop the power sector for achieving poverty eradication, lifting the country out of least-developed status by 2020 and export electricity as commodity to bring revenue into the country.

Another study conducted by Nonthaxay et al. (2003) firmly stressed that Laos has the advantage in terms of natural resources, especially water. Even though the industrial and service sectors are not fully majeure, hydropower is the biggest export commodity and its production is expected to double in the next ten years.

Hydropower development projects in Laos will be the chance for this country to make greater contribution to GHG with the international community (Jusi, 2014). China, Vietnam, Thailand and Cambodia are the parties to the Paris Agreement. These countries are neighbors to Laos and have high demand for clean electricity to increase their clean energy proportion and comply with the Paris Agreement while maintaining the supply electricity to their economies and households consumption. In addition, ASEAN plans to achieve carbon neutrality by 2050. Currently, the energy sources of GMS countries rely on imports of fossil fuels from outside the

region, therefore Laos' hydropower projects would bring significant macro-economic benefits by reducing dependency on these energy imports (Jusi, 2014). Therefore, market access for Lao hydropower is highly secured.

It is accepted generally that dams can store water during the rainy seasons and release it during the dry seasons. (Uppsala University, 2018). Likewise, Laos's hydropower dams and rainforests will play a big assistance to combat drought due to climate change in the Lower Sub Mekong Region, by storing water for dry season, which then be discharged to the Mekong during the dry seasons because 90 percent of Laos' total area accounts for more than 45 percent of the Mekong Basin, playing a very significant role in catching and storing the annual rainfall for GMS. The 1995 Mekong Agreement between GMS nations allows Laos to conduct its hydropower development.

2.2.2. Issues and Challenges for Laos' Hydropower Development

Policy

Despite the potential, hydropower development policy in Laos may also encounter issues and challenges. Firstly, hydropower development projects are capital-intensive industry and requires skilled labor. These financial and human resources in Laos are very limited for development of hydropower. Impediments to socio-economic development include high illiteracy, birth and infant-mortality rates, low productive efficiency, lack of experienced staff and skilled labour, and a system of law and regulations, which is still incomplete. These are the main barriers to implementing the government's strategy of equitable socio-economic development (Nonthaxay et al., 2003).

Another issue is the capacity to develop hydropower projects sustainably. The

challenge for Laos is how to have the sustainable approach which can develop its hydropower potential socially, environmentally and economically (Jusi, 2011).

Development of hydropower dams on the mainstream of the Mekong River in the territory of Laos will also be the challenge for the government of Laos as oppositions increase. The world has turned its attention on the construction of dams on the Mekong in Laos (Middleton, 2022).

Another challenge is the growing demand for participation by the GMS countries in the governance of environmental impacts from the hydropower development projects on the mainstream of the Mekong River. Transboundary governance of the environmental impacts from the dams built in the territory of Laos must be established by GMS countries (Suhardiman et al., 2021).

Climate changes will have impacts on hydropower development in Laos. Even though Laos is a minority contributor of greenhouse gases, climate change at global and regional levels may have significant impact on the country and energy sector including hydropower (Jusi, 2011).

2.2.3. International Perspectives on Hydropower Development as Improvement for Laos' Hydropower Development

Hydropower is a type of clean energy which is important for achieving SDG 7. Another interesting finding in the Tracking SDG 7: The Energy Progress Report prepared by IEA, IRENA, UNSD, World Bank, WHO in 2020 also shows that

“SDG target 7.1 is universal access to affordable, reliable, sustainable, and modern energy services; with 7.1.1 focusing on access to electricity Recent years have seen rapid growth in access to electricity after an accelerated deployment of affordable electrification options, including on- and

off-grid solutions. As a result, the global population lacking access to electricity dropped to 789 million in 2018, from 1.2 billion in 2010.”

There are also other studies which show the strong relationship between electric power development and the development of other sectors in developing countries. For example, “India’s success in rapidly increasing access to electricity for the poor, shows that access to electricity also enables many services that contribute to achieving other SDGs.” (International Institute for Sustainable Development, 2021).

To ensure the economic success of sustainable development of the hydropower sector, Feed-In Tariff (FIT) is needed. For example, 18 of the 28 countries provide FITs for hydropower and the rates are on average the lowest for all renewable energy sector (RES), with several countries choosing to prioritize wind and solar PV (Ramli et al., 2015). A country in the African continent, has put a lot of efforts and measures in the development of its RES and in its 2009 development plan gave way to the construction of small hydropower projects by 4 locally registered companies. Each company constructed one project with a subsidy of around 30 - 50%. However, the developments were faced with a number of regulatory challenges because the FIT was then not in place. Therefore, the FIT received a high level of political support as it was taken as broad development strategy for the development of RES instead of an additional plan (Ramli et al., 2015).

A hydropower project has to mitigate the environmental and social impacts robustly. It needs improved management of natural resources, agriculture and livestock as they are important for sustaining the livelihoods of the project affected people. The hydropower project must also provide support for the downstream communities to mitigate any impacts on their activities along the downstream areas. The project developer must support the activities of the government to protect the

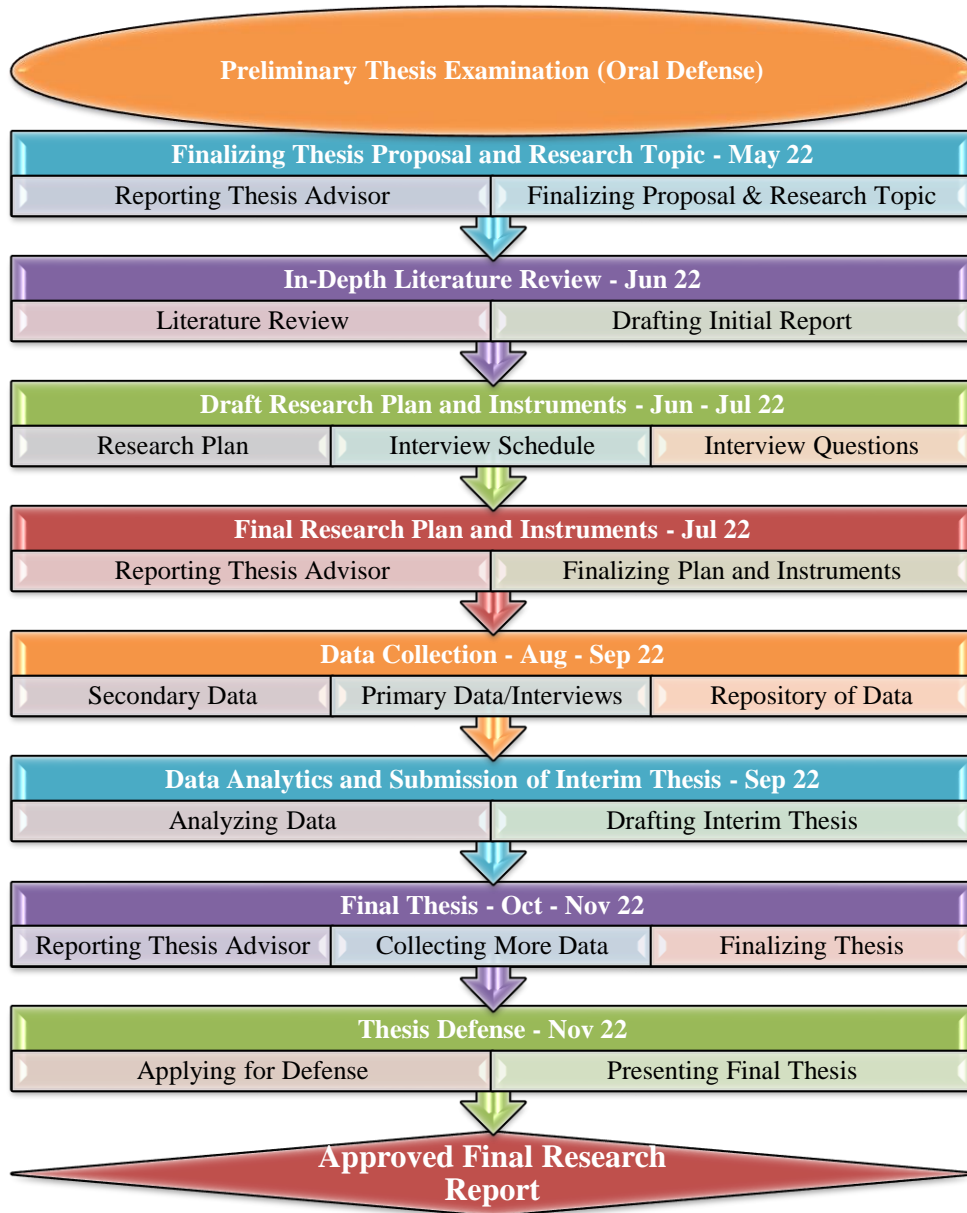
catchment area (Zachau, 2015).

Chapter 3. Research Method

3.1. Research Framework

The research was carried out in accordance with the framework as shown in Figure 3 below:

Figure 3: Research Framework.



Source: Developed by the Author

3.2. Data Collection

This research was non-experimental and exploratory, which aimed to review the implementation of PSHD by collecting qualitative data through interviewing the selected staff of the concerned authorities for PSHD implementation and the developers of the selected hydropower projects in Laos as the primary source. The secondary sources such as statutory laws and regulations, reports and other relevant documents of data were also utilized.

3.2.1. Primary Data

3.2.1.1. Preparation for interviews

The preparation was conducted from August to early September, 2022. Firstly, the author identified the list of concerned staff of the concerned authorities and the developers as planned in the thesis proposal. In order to facilitate the request for the interviews, GSPA issued a request letter for the author to use as the reference to request for interviews with the identified staff. The author used a social media application called WhatsApp to approach the staff and sent the electronic copies of the request letter to the staff in advance. After that the staff reported about GSPA request letters to their supervisors to seek permission for participating in the interviews with the author. This process consumed a lot of time since the staff needed further clarification about the objective of the research, advanced set of interview questions and assurance of confidentiality and the author provided the clarification accordingly.

Subsequently, all of the concerned staff of the concerned authorities received the permission from their supervisors. On the developer side, however, only five of 15 developers agreed and allowed their staff to participate in the interviews with the

author while the others just did not reply or asked the author to submit new request through Ministry of Energy and Mines. The author decided not to pursue any further approach with the missing developers since this research has been conducted in the name of GSPA, not the government. The author and interviewees set schedules for the interviews to be conducted at night time or on weekends because the interviewees were busy during working hours. The author sent the interview questions to the interviewees in advance so that they could have sufficient time to prepare for the interviews.

3.2.1.2. Actual Interviews

The concerned authorities and the developers agreed to participate in the interviews are listed in Table 1 and Table 2 below.

Table 1: List of Concerned Authorities Agreed to the Interviews

Name of Agencies	Interviewees	Rationale
Electricite Du Laos (EDL)	1 official	A state-owned enterprise which is the sole off-taker and distributor of electricity in Laos.
Ministry of Energy and Mines (Department of Energy Policy and Planning or DEPP)	1 planning official	This department is responsible for planning the power system and monitoring and enforcing the developers' obligations related to feasibility study of their projects.
Ministry of Energy and Mines (Department of Planning and Cooperation or DPC)	3 investment official	This department is responsible for drafting and negotiating the concession agreements with the developers about the terms and conditions required by laws, PSHD and other relevant obligations of the GOL and the developers for

		construction, operation of the concerned hydropower development projects.
Ministry of Energy and Mines (Department of Energy Business or DEB)	3 officials	This department is responsible monitoring compliance by the developers with their obligations under the relevant concession agreement, laws and regulations.
Ministry of Energy and Mines (Department of Energy Industry Safety Management or DEISM)	1 official	This department is responsible for technical inspection of the construction and operation of the hydropower plants.
Ministry of Agriculture and Forestry (Department of Forestry or DOF)	1 official	This department is responsible for assessment of impacts on forests and biodiversity in the project areas, set mitigation measures, monitoring compliance by the developers of their forest rehabilitation and forest protection obligations.
Ministry of Natural Resources and Environment (Department of Environment or DOE)	1 environment official	This department is responsible for monitoring compliance by the developers of their obligations under the laws and regulations about conducting the environmental impact assessment, negotiating and incorporating environmental impact mitigation measures into hydropower development license.
Ministry of Natural Resources and	1 environment official	This department is responsible for monitoring compliance by the

Environment (Department of Natural Resources and Environment Inspection or DONREI)		developers of their obligations on environmental impact mitigation measures as stated in the laws and concession agreements.
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Table 2: List of Hydropower Projects Agreed to the Interviews

Name of Projects	Interviewees	Project Status
Huay Ho Hydropower Project	1 officer	Close to Transfer Stage, 152 MW, 99% of electricity to export to Thailand and 1% for domestic supply
Nam Theun 2 Hydropower Project	1 officer	Operation Stage, 1070 MW, 95% of electricity to export to Thailand and 5% for domestic supply
Nam Theun 1 Hydropower Project	1 officer	Operation Stage, 650 MW, 520 MW of electricity to export to Thailand and 130MW for domestic supply
Nam Kong 3	1 officer	Construction Stage, 45 MW, All electricity output to export to Vietnam
Nam Emoun Hydropower Project	1 officer	Planning Stage, 133 MW, All electricity output to export to Vietnam

The interviews were conducted virtually in which the interviewer was in South Korea while the interviewees were in Laos. The interviewer prepared the virtual meeting online link from Google Meet and sent it to WhatsApp account of the interviewees. In some cases, the interviewees preferred to conduct the interviews

via video calls through WhatsApp application which the interviewer made the calls from Seoul to WhatsApp account of the interviewees.

The interviews were usually conducted at night times or on the weekends because the interviewees who were quite busy during working hours. Most of the interviews ran approximately an hour for each interview.

The interviewees were very cooperative and did their best to provide insight data, information and issues related to the research topics and to answers the interview questions. They were also very kind and request nothing in exchange of their efforts made for these interviews. However, they strongly requested the author for non-disclosure of their identities.

3.2.1.3. Questionnaires

The policy evaluation theory involves assessment of different parts of the policy. In a lecture of Graduate School of Public Administration in 2021, Professor Lee Sukwon suggested that when conducting a policy evaluation, the main questions to be answered are (1) what are the nature and scope of the problem requiring the policy, (2) is the policy implemented as designed, (3) is the policy effective, (4) what are the costs relative to its effectiveness and benefits and (5) what are the measurable outcomes?

However, the review from this research focused only on the assessment of the instruments section of the policy or implementation part. Therefore, this research investigated and explained (1) why PSHD was established, (2) how PSHD has been implemented by the concerned authorities and the hydropower project developers and (3) what are the issues or challenges in the implementation of the policy and what measures or actions to be taken.

Therefore, it was difficult to turn the interview questions into a questionnaire

form because the interviews were to find the answers, for example, what are their duties under PSHD, how do they implement their duties, what are the issues or challenges for implementing PSHD and how do they address the issues or challenges? However, for different interviews with different participants, the interviewer also needed to use additional questions which were more specific to the duties of the concerned authorities, the hydropower projects and the context of the interviews to obtain answers to the research questions.

3.2.2. Secondary Data

Apart from collecting primary data from the interviews with the concerned authorities and the developers, the author also studied the following sources for collecting the secondary data, especially the data related to the reasons for establishment of PSHD, the process and outputs of PSHD as shown in Table 3 below.

Table 3: List of Secondary Data Sources

	Name of Sources
1	Law on Electricity (Amended), 2017
2	Law on Investment Promotion (Amended), 2016
3	Law on Environmental Protection (Amended), 2012
4	Law on Water and Water Resource (Amended), 2017
5	Law on Forest (Amended), 2019
6	Law on Land (Amended), 2019
7	Policy on Sustainable Hydropower Development (PSHD), 2015
8	PSHD Guideline, 2015
9	Ministerial Instruction on Initial Environmental Examination of the Investment Projects and Activities, 2013
10	Ministerial Instruction on the Environmental and Social Impact Assessment for the Investment Projects and Activities, 2013
11	Terms of Reference (ToR) of Basic Design, 2018
12	Lao Electrical Power Technical Standard (LEPTS), 2018

13	Guideline on Operating and Managing Lao Electric Power technical Standards, 2007
14	Decree No. 84 on Compensation and Resettlement Management in Development Projects, 2016
15	Terms of Reference (ToR) for Pre-Feasibility Study, 2018
16	Terms of Reference (ToR) for Final Feasibility Study, 2018
17	Safety Rules for Operation and Maintenance of Electrical Facilities, 2007
18	Model of Concession Agreement for Hydropower Development Project
19	Dam Safety Guidelines, 2018
20	Guideline on Standard Operating Procedures of Hydropower Development Project, 2020
21	Report on IPP Projects by Department of Energy Business, October 2022

Chapter 4. Findings

This chapter illustrates the findings which were compiled to address research topic and the research question which were explored based on three core sub questions (1) why PSHD was established, (2) how the concerned authorities and the hydropower project developers implemented PSHD and (3) what issues or challenges in the implementation of the policy and what measures or actions were or will be taken in response to the issues or challenges. The findings of this research are as followings.

4.1. Why was PSHD established?

The answers to this question is very important as they could be the fundamental ground for the research to explore and assess whether PSHD has been implemented in line with its design. What this research found is as followings.

4.1.1. Early Stage of PSHD

The Introduction section of PSHD Guideline states that the GOL initiated the investment promotion policy in 1986 to attract more investment into the country and boost the economic development. By that time, hydropower development had little connection with long-term sustainability and only formed a part of the investment promotion policy which focused mostly on attracting investment, first-come-first-served basis, increase of electricity output for domestic supply and export and taxes collection. It kept changes to adapt to the external influence. In addition, the policy tended to be investor-oriented.

After that the GOL also gained a lot of experiences and found that hydropower development has the potential to be export commodity as well as power supply for domestic demand. At the same time, the GOL also found that a lot of issues and

challenges from the implementation as well as concerns and influences from different key players in the regions could have impacts on the potential. Therefore, it was important that the GOL developed a policy which could turn all aspects of hydropower project developments more sustainably.

Subsequently, in 2005, a National Policy on Environment and Social Sustainability of Hydropower Sector in Lao PDR (NPSH) was adopted and applied (IFC, 2022). To realize the new policy, during 2006-2014, the GOL established and improved laws, secondary regulations, and institutional frameworks related to the implementation of NPSH which changed the way of exploitation of the hydropower resources in the country. Implementation of PSHD would benefit not only the economic sector, but also social and environmental sectors. For instance, PSHD would protect the forests around the reservoirs of the hydropower projects, which then could store rain water for dry seasons. These forests could be CO₂-natural sink which would also benefit Laos to stay carbon negative. Thus, hydropower dams and its forests could help Laos in combating drought due to Climate Change. Because of the hydropower dams, Laos would protect its rainforests which could be an important natural carbon stock to fight Climate Change and to combat drought by storing rainwater during rainy seasons discharge to the Mekong in dry seasons, playing a very significant role in the GMS economic activities, such as agriculture, fishery, aquaculture, navigation and tourism.

4.1.2. Core Principles of PSHD

The principles of PSHD run on 4 elements of hydropower sustainability consist of “3-E and 1-S”: Engineering – guarantee safety, ensure the use of modern technology and equipment and prevent or mitigate damage to natural resources and

third parties during the survey, design, construction and operation stages; Economic – reliance upon the maintenance of the renewable resource base, and the use of non-renewable resource rents support the development of other factors of production; Environment – relies upon the avoidance of irreversible environmental impacts such as the loss of biodiversity, accumulation of persistent pollutants, or disruption of ecological cycles; Social – based upon the better-off of project affected people from the projects development through the process of public participation.

4.1.3. Objectives of PSHD

According to the Prime Minister’s Decree on Adoption of the Policy on Sustainable Hydropower Developer, hydropower sector plays an important role to achieve the objectives of the National Strategy on Poverty Eradication and Economic Development and for supporting regional energy demands. To achieve socio-economic sustainability, the GOL develops hydropower as an export commodity as well as to supply electricity demand for the national socio-economic development and contributing to the national security and improving living conditions of the people. The GOL promotes all both domestic and foreign individuals, legal entities, and organizations to invest in hydropower development in conjunction with watershed protection and in ensuring that hydropower operation is consistent with the national socio-economic development plan, safe, effective, economic, and sustainable, and that the potential adverse impacts on affected people, natural resources, and environment are effectively mitigated.

4.2. How has PSHD been implemented?

The answers to this question could form the basis for this research to assess whether PSHD was formed, adopted and implemented in accordance with the policy

life cycle theory. This research found the answers which can be summarized as followings.

4.2.1. Formation and Adoption

After establishing the National Policy on Environment and Social Sustainability of Hydropower Sector in Lao PDR (NPSH) in 2005, the key laws and regulations were subsequently developed to support the policy included the Law on Investment Promotion in 1986 (amended in 2004, 2009 and 2016), the Law on Water and Water Resources in 1996 (amended in 2017), the Law on Electricity in 1997 (amended in 2012 and 2017), the Law on Environmental Protection in 1999 (amended in 2012), the Law on Forest in 2007 (amended in 2019), the Law on Land in 2003 (amended in 2019), the Environmental Impact Assessment Decree in 2010, the Ministerial Instruction on Environmental Impact Assessment in December 2013, the Compensation and Resettlement Decree in 2005 (amended in 2016), the Protection Forest Decree in 2010, the Forestry and Forest Resource Development Fund in 2006.

The key institutional arrangement, in addition, was also established to exercise the policy, which included Ministry of Energy and Mines (MEM) in 2006 and its restructuring in 2011-2012, the establishment of the Water Resources and Environment Agency (WREA) in 2007 and its upgrading to the Ministry of Natural Resources and Environment (MONRE) in 2011-2012 and the re-organization of the Ministry of Agriculture and Forestry (MAF) in 2011-2012. In addition, NPSH was updated with active involvement of the concerned agencies through a series of meetings including consultation workshops with other key international organizations during 2013-2014.

Because the scope of NPSH expanded to cover the technical and engineering aspects as well as the environment and social impacts, the name of the policy was changed to the Policy on Sustainable Hydropower Development (PSHD) in 2015 and adopted by the Prime Minister of Lao PDR under the Decree no. 02/PM, issued on 12 January 2015.

4.2.2. Implementation

According to the Law on Electricity, development of a hydropower project in Laos is a type of business which applies the form of independent power producer (IPP) of which the project is developed by entities who reach out to the government with a proposal to develop the project without an explicit request from the government to do so. Once approved, the entities develop and run the project and its related business activities in the scheme of BOT (build, own, operate and transfer) which gives a concession right to the entities to build, own, operate and transfer the project to the GOL after the end of the concession right or concession period as agreed by the GOL and the entities in the concession agreement (CA).

The Law on Electricity requires the development of hydropower projects with installed capacity of larger than 5 MW to be authorized by the central level authorities, while the local level authorities to authorize the projects of 5 MW or less.

The relevant laws such the Law on Electricity, the Law on Investment Promotion, the Law on Environmental Protection, the Law on Forest and the Law on Water and Water Resources, and the related regulations lay out the development of a hydropower project under the IPP scheme through 4 subsequent stages, namely, planning stage, construction stage, operation stage and transfer stage. Each stage

requires completion of specific activities in order to advance to the next stage. The activities lay out certain obligations or duties of the concerned authorities and the developers and can be summarized as shown in Table 4 below.

Table 4: Summary of Development Stages of Hydropower Project and Related Activities

Development Stage		Activities
<i>Planning</i>	1	Screening of Developer
	2	Negotiation and Approval of Memorandum of Understanding
	3	Approval of Preliminary Feasibility Study
	4	Approval of Terms of Reference for Environment and Social Impact Assessment
	5	Negotiation and Approval of Project Development Agreement
	6	Approval of Final Feasibility Study
	7	Approval of Environmental and Social Impact Assessment
	8	Negotiation and Approval of Power Tariff Memorandum of Understanding
	9	Approval of Basic Design
	10	Approval of Social and Environmental Standard Obligations
	11	Negotiation and Approval of Concession Agreement
<i>Construction</i>	12	Negotiation and Approval of Power Purchase Agreement
	13	Construction Monitoring
	14	Approval of Impoundment
<i>Operation</i>	15	Operation and Maintenance Monitoring
<i>Transfer</i>	18	Project Refurbishment and Overhaul before Transfer
	19	Project Transfer

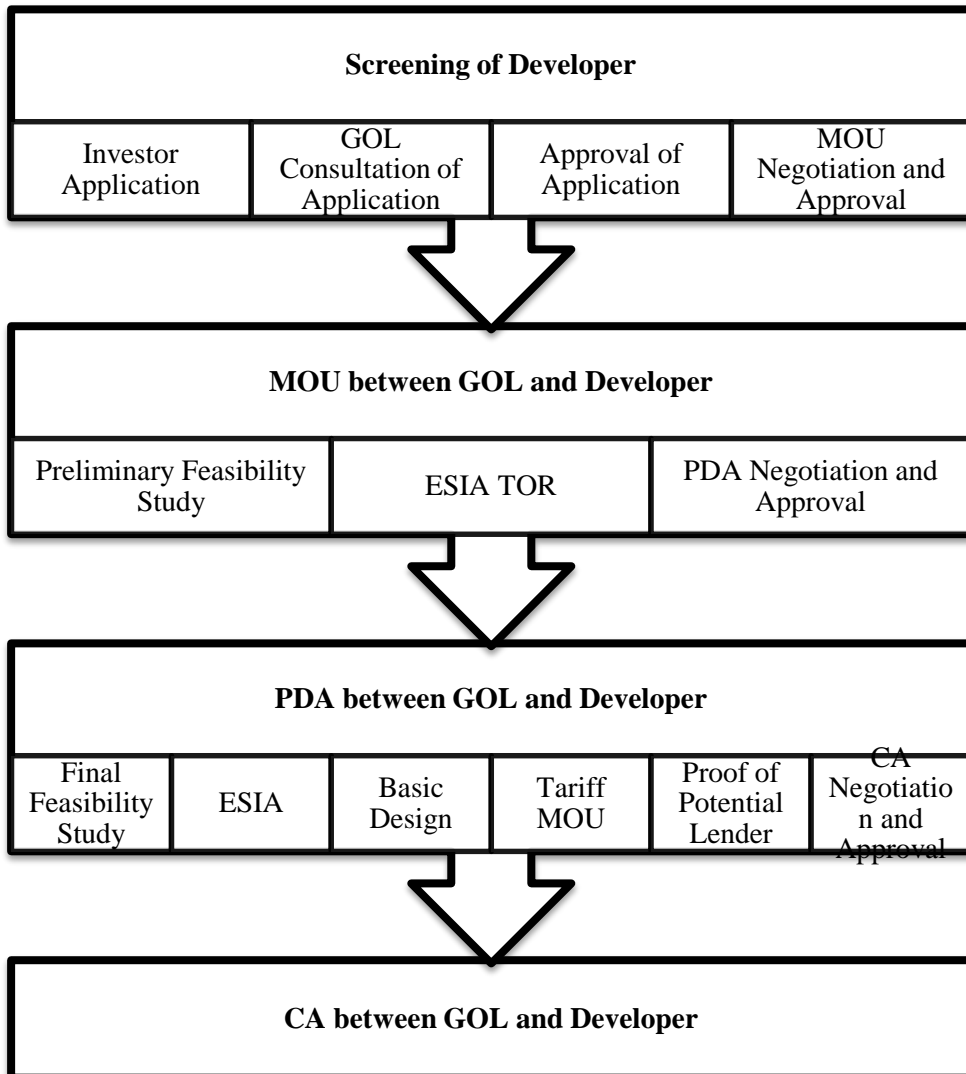
The brief description of each activity under Table 4 is explained in the

following section.

4.2.2.1. Planning Stage

In the planning stage, the concerned authorities and the developers had the duties and activities to fulfill as followings.

Figure 4: Process of Activities under Planning Stage



Source: Developed by the Author

4.2.2.1.1. Screening of Developer

The Law on Electricity and the Law on Investment Promotion state that screening of a developer for a hydropower development project is conducted without a bidding. It is a process where an entity reaches out to the GOL with a proposal to develop a hydropower project, without an explicit request from the GOL to make such proposal. The entity submits its application form and supporting documents for development of the identified project to Ministry of Planning and Investment (MPI) which will validate and consult for inputs from other concerned authorities on the technical aspects of the application and the capability of the developer before granting approval of the application.

4.2.2.1.2. Negotiation and Approval of Memorandum of Understanding

According to the Law on Investment Promotion and the Law on Electricity, the Memorandum of Understanding (MOU) is a form of agreement between the GOL and a hydropower project developer, which grants the developer the mandate to carry out project development activities for a period of 24 months.

Once the application for hydropower development project is approved, MPI provides the standard draft of the Memorandum of Understanding (MOU) to the entity for their review and preparation for negotiation of the draft. MPI and the concerned authorities have some rounds of negotiation with the entity to finalize and agree on specific activities, terms and conditions related to the project and the project developer to be captured in the MOU. After that MPI report the draft MOU to PMO for approval before signing the MOU.

After signing the MOU, the entity becomes the project developer which is required to set up a representative office in Lao PDR before conducting any activities listed under MOU. During the mandate period, the developer conducts two main

activities, namely, Preliminary Feasibility Study and Terms of Reference (TOR) for Environmental and Social Impact Assessment (ESIA).

4.2.2.1.3. Approval of Preliminary Feasibility Study

According to the Guideline on Standard Operating Procedures of Hydropower Development Project, the primary goal of Preliminary Feasibility Study (PFS) is for the developer to conduct study, survey and investigation to obtain necessary data and information for making adequate analysis regarding technical, social, environmental, economic, financial and safety aspects including evaluation of alternatives and identification of risks. PFS is an important obligation of the developer under the MOU, which needs to be completed and approved before entering into Project Development Agreement (PDA). The developer submits the PFS report to MEM which will consult with the concerned authorities and the developer for any critical review and revision of the report before approving PFS.

4.2.2.1.4. Approval of Terms of Reference for Environment and Social Impact Assessment

According to the Guideline on Standard Operating Procedures of Hydropower Development Project, during the MOU mandate, the developer needs to prepare the Terms of Reference (TOR) and Environmental and Social Impact Assessment (ESIA) which is a scoping report with details of various aspects to be studied and investigated in detail during ESIA. The TOR will provide sufficient information on environmental and social impacts for justification of whether to accept, revise or reject of the project. The developer submits the TOR report to Ministry of Natural Resources and Environment (MONRE) which will consult with the concerned authorities and the developer for any critical review and revision of the report before approving the TOR.

4.2.2.1.5. Negotiation and Approval of Project Development Agreement

The Law on Electricity states that after the developer completes its obligations under MOU, MEM provides the standard draft of Project Development Agreement (PDA) to the developer for its review and preparation for negotiation. MEM and the concerned authorities have some rounds of negotiation with the developer to finalize and agree on specific activities, terms and conditions related to the project and the developer to be captured in the PDA.

After that MEM reports the draft PMO for approval before signing it. The PDA is an agreement between the GOL and the developer, which the GOL grants the developer the mandate of 24 months to undertake greater study and project development activities such as Final Feasibility Study (FFS), ESIA, Basic Design, Power Tariff MOU, Shareholders' Agreement and finding potential lenders and contractors.

4.2.2.1.6. Approval of Final Feasibility Study

According to the Guideline on Standard Operating Procedures of Hydropower Development Project, the primary goal of the Final Feasibility Study (FFS) is to conduct greater detailed study, investigation and survey as subsequent to the approved PFS. FFS describes all possible options with respective advantages and disadvantages, the preferred option with overall project concept, project description and project justification by providing preliminary support data/information and undertaking adequate analysis regarding technical, social, environmental, economic, financial and safety aspects including evaluation of alternatives and identification of risks.

FFS is an important obligations of the developer during the PDA term, which needs to be completed and approved before signing Concession Agreement (CA).

The developer submits the FFS report to MEM which will consult with the concerned authorities and the developer for any critical review of any changes or improvement compared to the PFS, compliance with LEPTS and revision of the final report before approving the FFS.

4.2.2.1.7. Approval of Environmental and Social Impact Assessment

The Guideline on Standard Operating Procedures of Hydropower Development Project states that Environmental and Social Impact Assessment (ESIA) is a study to identify, predict and assess the potential environmental and social impacts of a proposed hydropower project. It also evaluates alternatives and designing appropriate mitigation, management and monitoring measures. The study includes Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Social Management and Monitoring Plan (SMMP), Environmental Management and Monitoring Plan (EMMP), Resettlement Action Plan (RAP), and Ethnic Minority Development Plan for any affected to people in the project area and its vicinity in compliance with the Policy on Sustainable Hydropower Development. ESIA also provides basis for negotiating and posting legally binding environmental and social obligations on the developer.

The developer submits the ESIA documents to MONRE which will consult with the concerned authorities and the developer for any critical review of compliance with the ESIA TOR, regulations and revision of the final report before approving the documents and issuance of Environmental Certificate for the project.

4.2.2.1.8. Negotiation and Approval of Power Tariff Memorandum of Understanding

The Guideline on Standard Operating Procedures of Hydropower Development Project states that Power Tariff Memorandum of Understanding (Tariff MOU) is a

preliminary agreement between the developer and the off-taker to record the tariff negotiation, fundamental principles and mutual understanding to which the both parties have agreed and which shall form the basis for each party in preparing, negotiating and signing a Power Purchase Agreement (PPA) between them.

After the FFS is approved, the developer, MEM and the concerned authorities approach the off-taker to present the project and their intention to sell the power to the off-taker. MEM role is to review the technical, legal, technical and commercial aspects of the draft Tariff MOU which is provided by the off-taker. To ensure the best tariff and benefits to the GOL, MEM, the developer and the concerned authorities work together to review and negotiate the draft with the off-taker. When the agreement is reached, MEM reports the draft Tariff MOU to PMO for approval to permit the developer and the off-taker to sign the Tariff MOU.

4.2.2.1.9. Approval of Basic Design

According to the Guideline on Standard Operating Procedures of Hydropower Development Project, Basic Design (BD) is a crucial step in any hydropower project development as it lays down the structure of the project facilities that need to be developed in accordance with the technical guidelines and sustainable and environment friendly aspects.

The developer prepares and submit documents related to BD which include the Inception Report, Quarterly Progress Report, Design Criteria Report and Draft and Final Basic Design Report to MEM for approval. MEM together with the concerned authorities hold many rounds of consultation with the developer to review the documents to ensure compliance with LEPTS, law requirements, FFS, ESIA and other relevant engineering standards before approving them which must be completed prior to signing CA.

4.2.2.1.10. Approval of Environmental and Social Obligations

The Guideline on Standard Operating Procedures of Hydropower Development Project states that after the ESIA documents are approved by MONRE, Environmental and Social Obligations as a suite of contractual arrangement is negotiated and agreed by MONRE and the developer. It sets out all environmental and social obligations of the concerned authorities and the developer for mitigating the environmental and social impacts of the project as identified in the ESIA documents. The ESO is completed prior to signing the CA and it forms as an integral, binding and legally valid part of the CA.

4.2.2.1.11. Negotiation and Approval of Concession Agreement

The Law on Electricity states that Concession Agreement (CA) is an agreement between the GOL and the developer, which provides the concession period, rights, obligations and benefits of the parties and other persons, as well as other matters related to the implementation the project for the term of the CA. The CA term starts from the effective date of the CA and may be extended upon approval by the GOL.

CA negotiation is undertaken upon completion of activities and the developer obligations under the PDA. MEM is the primary authority for this task. The developer submits its request for starting the negotiation and other related evidence of its completion of its obligations. MEM reviews and ensure correctness of the evidence before sending the standard draft CA to the developer for review and preparation for the negotiation.

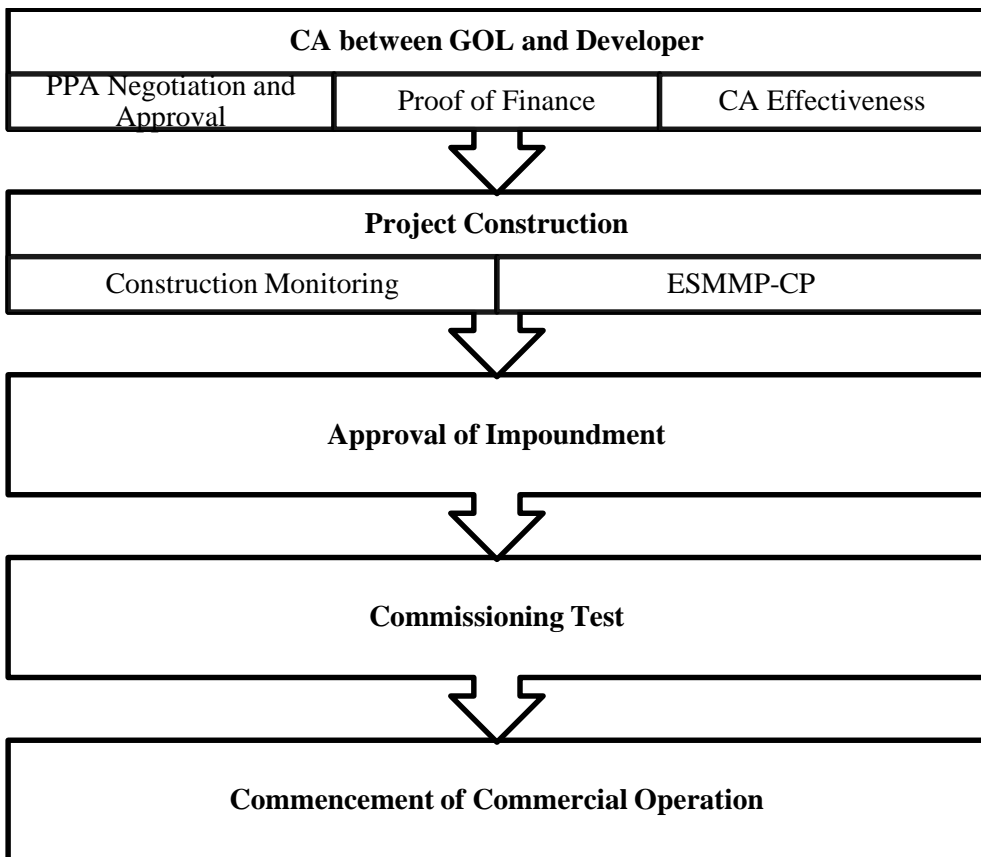
Many rounds of negotiation between MEM, concerned authorities and the developer are held to finalize and agree on the concession period, rights, obligations and benefits of the GOL in the form of taxes, funds and other financial contribution required by the laws at the rates or amounts which guarantee the developer of the

most viable internal rate of return from its investment in the project during the concession period. Upon completion of the negotiation of the draft CA, MEM report the draft CA to PMO for approval before signing.

4.2.2.2. Construction Stage

In the construction stage, the concerned authorities and the developers had the duties and activities to fulfill as followings.

Figure 5: Process of Activities under Construction Stage



Source: Developed by the Author

4.2.2.2.1. Negotiation and Approval of Power Purchase Agreement

The Guideline on Standard Operating Procedures of Hydropower Development Project states that Power Purchase Agreement (PPA) is a commercial agreement between the developer and the off-taker, which is subsequent to the Tariff MOU.

The PPA specifies terms and conditions for the sale of electrical power from the hydropower project of the developer to the off-taker at an agreed tariff for a contracted period.

Once the Tariff MOU is signed, the developer prepares in consultation with the concerned authorities and submits the draft PPA as per specified format of the off-taker along with supporting documents to the off-taker. The negotiation of the draft PPA is proceeded in parallel to CA negotiation between the developer and the GOL. The PPA, however, is signed only after signing of the CA.

To ensure the benefits to the GOL and the consistency between the CA and the PPA, MEM and the developer work together to review and negotiate the draft PPA with the off-taker. When the agreement is reached, MEM reports the draft PPA to PMO for approval.

4.2.2.2.2. Construction Monitoring

The Guideline on Standard Operating Procedures of Hydropower Development Project states that after the CA is signed and becomes effective, the developer begins the related construction activities of the project in compliance with its obligations, the terms and conditions specified in the related laws, regulations, the CA, the approved BD, FFS, ESIA documents and the Environmental and Social Management and Monitoring Plan for Construction Period (ESMMP-CP). Prior to undertaking construction activities, the developer seeks approval on ESMMP-CP, which is to be renewed after every 2 years during the construction period.

Construction monitoring is to ensure the required compliance and carried out by the concerned authorities throughout the construction period. It is a critical task supervised by MEM who is the implementing agency with coordination and support from MONRE, MAF, the concerned local authorities and any other relevant

authorities such as Ministry of Finance, Ministry of Labor and Social Welfare.

4.2.2.2.3. Approval of Impoundment

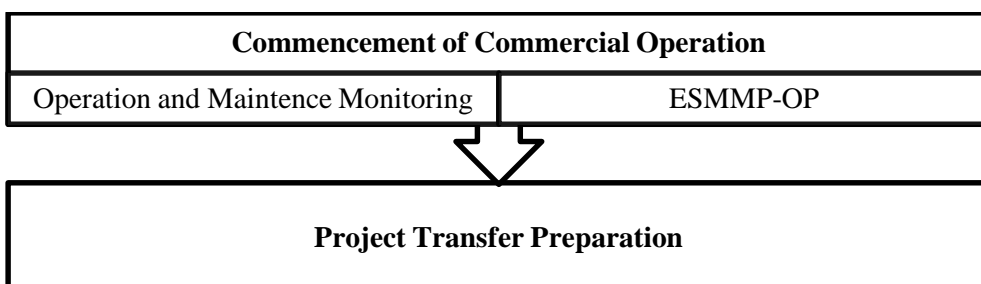
According to the Guideline on Standard Operating Procedures of Hydropower Development Project, most hydroelectric power projects require impoundment which allows a dam to store water of a river and creates a reservoir for regulation through a penstock to the powerhouse of the project and generate electrical power. The initial filling of the reservoir is the first test that the dam can perform the function for which it was designed.

The process for impoundment approval starts with the developer sending its request to MEM only after construction of the dam and all necessary facilities such as spillways and outlet works have been completed as well as the installation of appropriate instrumentation. After that MEM as the leading authority, MONRE and the other concerned authorities holds a series of consultation and site inspection with the developer on the readiness of the dam and other project related facilities as well as completion of the relocation of the PAP and the environmental mitigation aspects before approving the impoundment.

4.2.2.3. Operation Stage

In the operation stage, the concerned authorities and the developers had the duties and activities to fulfill as followings.

Figure 6: Process of Activities under Operation Stage



Source: Developed by the Author

4.2.2.3.1. Operation and Maintenance Monitoring

The Guideline on Standard Operating Procedures of Hydropower Development Project states that after completion of construction activities of the project, the developer needs to obtain the approval for Environmental and Social Management and Monitoring Plan for the Operational Period (ESMMP-OP) from MONRE prior to the commencement of the project commercial operation. The developer must prepare ESMMP-OP and submit to MONRE for approval. This plan specifies the obligation of the developer for mitigation of the environmental and social impacts during the operation period. The developer begins the related operation activities of the project in compliance with its obligations, the terms and conditions specified in the relevant laws, regulations, the CA, the approved BD, FFS, ESIA documents and ESMMP-OP.

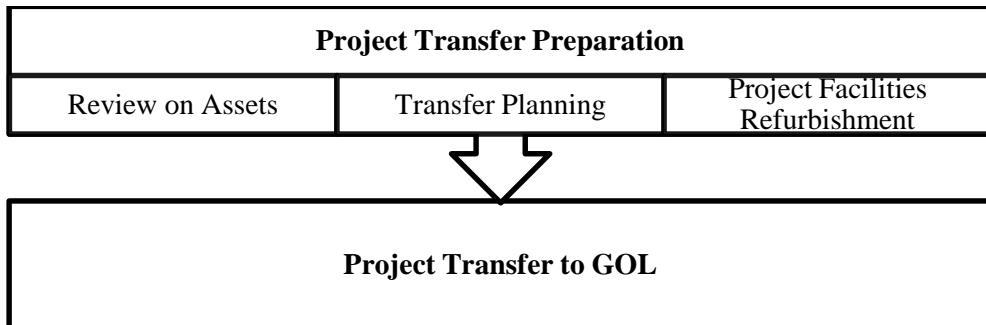
Operation and maintenance monitoring is to ensure the required compliance and carried out by the concerned authorities throughout the operation period. It is a critical task supervised by MEM who is the implementing agency with coordination and support from MONRE, MAF, the concerned local authorities and any other relevant authorities such as Ministry of Finance, Ministry of Labor and Social Welfare.

The monitoring is an ongoing process which begins after the project starts commercial operation which is permitted only after the developer obtain ESMMP-OP approval from MONRE and the Construction Completion Certificate (CCC) from MEM. When the developer commissions the project successfully, MEM further issues a COD certificate to the developer, which grants the right to start the operation of the project for the time period as stated in the CA.

4.2.2.4. Transfer Stage

In the transfer stage, the concerned authorities and the developers had the duties and activities to fulfill as followings.

Figure 7: Process of Activities under Transfer Stage



Source: Developed by the Author

4.2.2.4.1. Project Transfer

The Law on Electricity provides for the transfer of the project assets to the GOL free of charge at the end of the concession term. The assets include the rights on the project facilities and relevant documents such as manuals, data, records in relation to design, construction, operation and maintenance etc. MEM is the focal point in coordinating with the concerned authorities in taking the assets. The assets must be in a good operational condition as inspected and certified by an independent party as approved by the GOL.

The Guideline on Standard Operating Procedures of Hydropower Development Project states that this process starts after the independent party and the concerned authorities initiate the pre-expiry inspection of the assets 72 months prior to the scheduled date of expiry of concession period.

4.2.3. Policy Outputs

Before 1975, Laos had only one big scale hydropower plant, namely, Nam

Ngum 1 Hydropower Plant with the installed capacity of 30 MW only, and only the people of the cities of five provinces, namely, Vientiane, Luang Prabang, Khammouan, Savannakhet and Champasak, had accessed to electricity which made up only 19,000 households or only 3.3% of the population. After the initiation of investment promotion policy which included hydropower development promotion in 1986, investment on hydropower development projects started to increase even though at slow pace.

In 2005 when PSHD was initiated as National Policy on Environment and Social Sustainability of Hydropower Sector in Lao PDR (NPSH), Laos had 8 hydropower plants with the total installed capacity of only 940 MW which could generate electricity of 4,748 GWh annually only.

After that PSHD was fully developed and adopted in 2015 and it increased both investment in the power sector and the power generation output. In 2019, Laos had the ratio of electrification reached 95% of the total households, 78 power plants with the total installed capacity of 9,979 MW to generate 52,116 GWh annually, of which there were 44 large scale plants and 34 small scale plants. With the total number of power plants, there were 67 hydropower plants. National Statistics Bureau (2022) also showed that the export of electricity accounted for 31% of the total export in 2020.

Figure 8: Electrification in Laos from 1975 to 2019

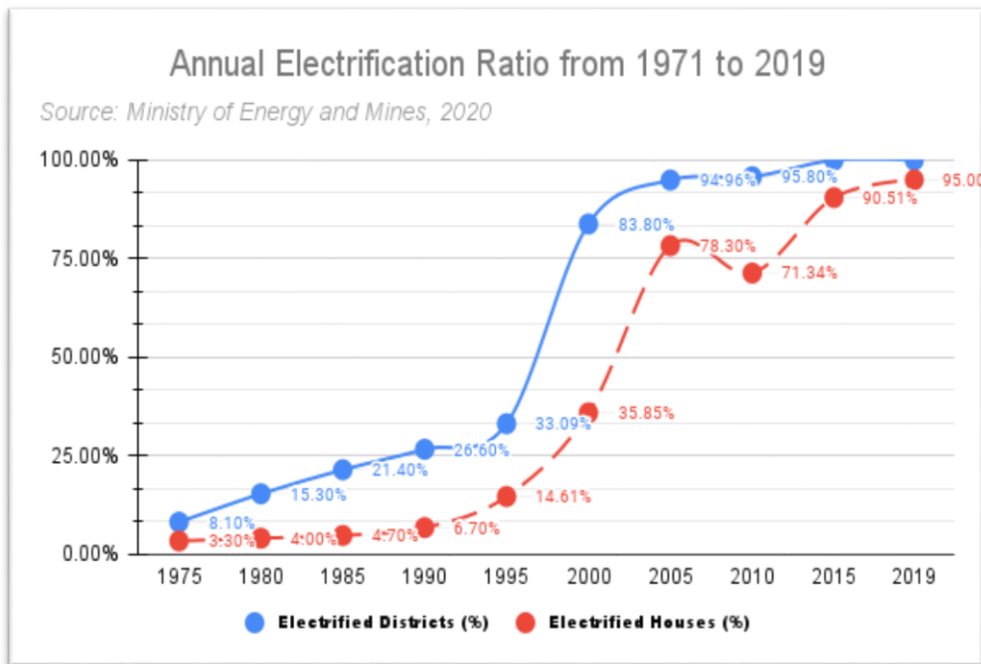


Figure 9: Power Output from 1975 to 2019

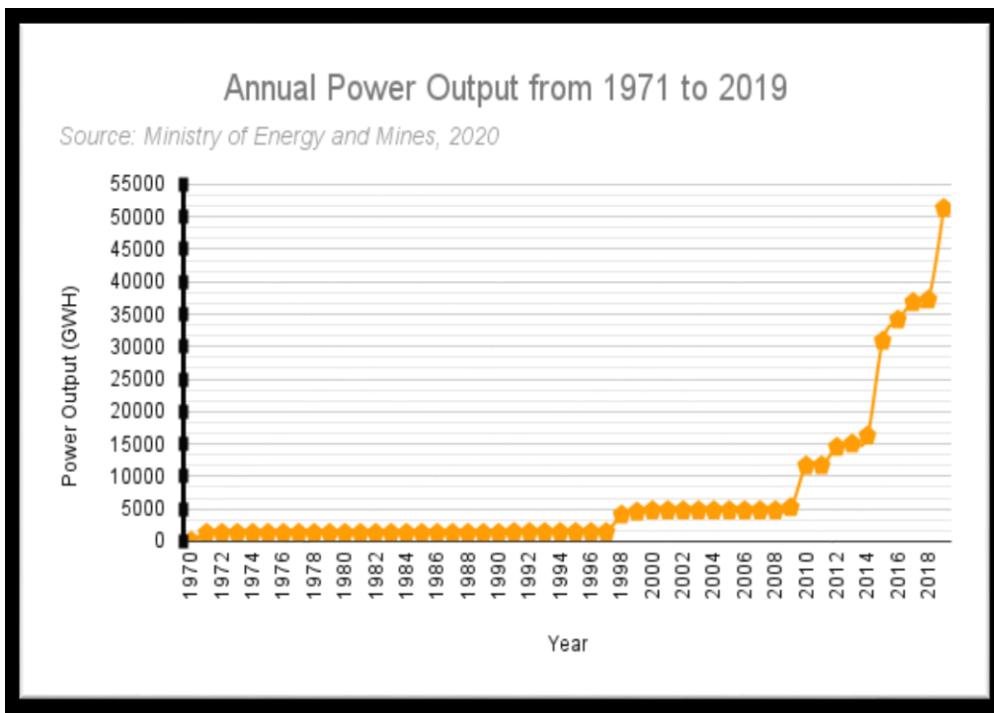


Figure 10: Number of Power Plants from 1970 to 2019

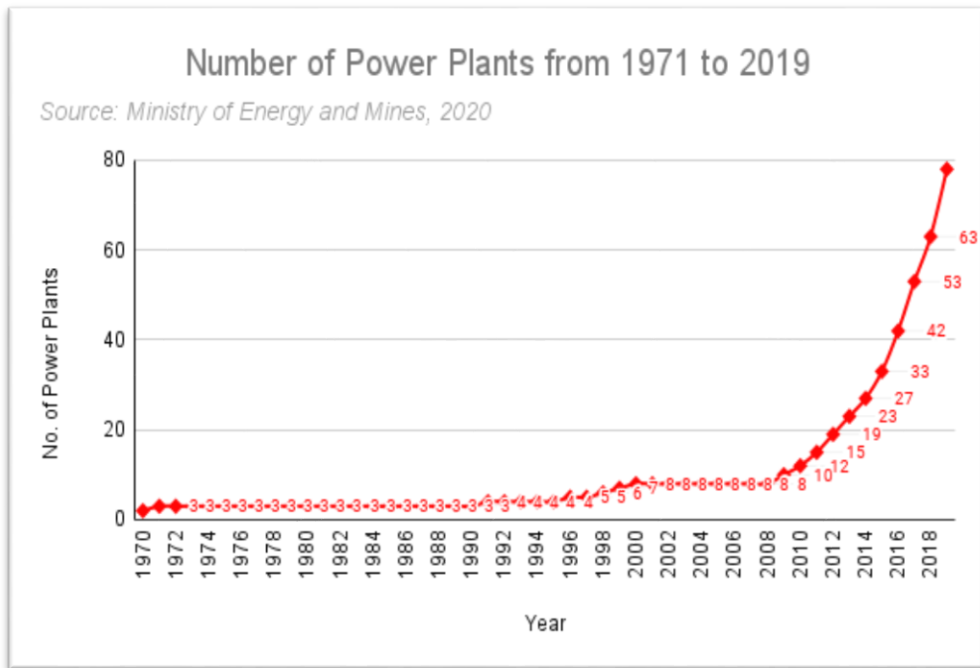
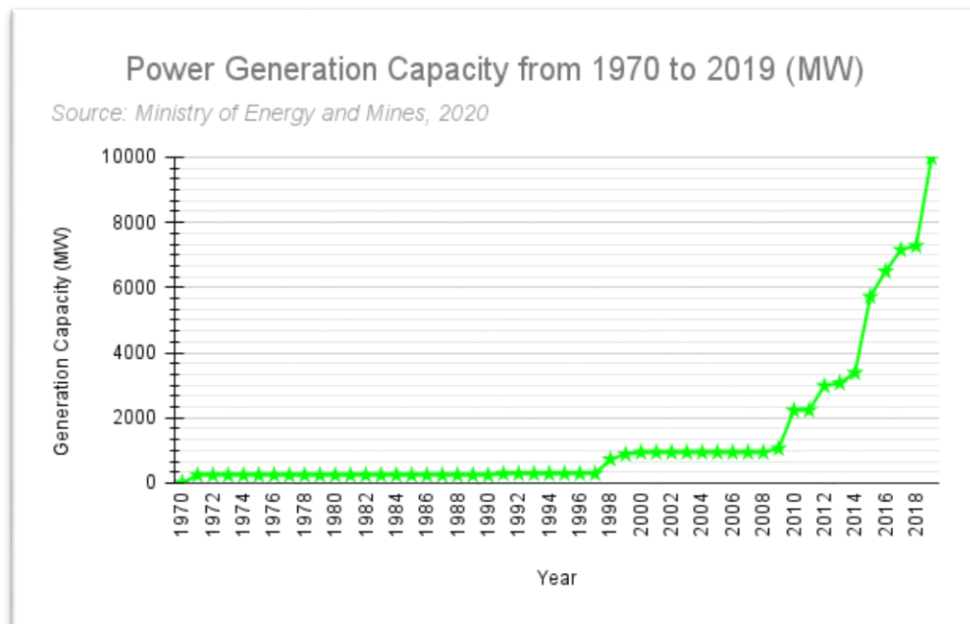


Figure 11: Power Generation Capacity from 1970 to 2019



Apart from the projects in the operation stage, there were also 21 projects in

construction stage (with total generation capacity of 6,781 MW) in which the construction is expected to be completed during 2023 to 2028. In addition, 67 projects are in planning stage. The first project to be transferred to the GOL is Huay Ho Hydropower Project in September 2029.

4.3. What are the issues or challenges in the implementation of PSHD?

The answers to this question are the crucial outputs of this research as they are the fundamental part of the review of this research. With respect to the development stages of hydropower projects in Laos, the interviews with the concerned authorities and project developers showed many critical issues and challenges in the implementation of PSHD. The concerned authorities and developers also suggested many solutions of their own opinions. In this section, the author discussed and proposed possible solutions. Details can be summarized as below.

4.3.1. Common Challenges

This Common Challenges section shows and explains about the issues or challenges which were commonly found in each development stage of PSHD and those which did not belong to any of the development stages but were agreed by the interviewees that they could have negative impacts on the success of PSHD. This research found the following common challenges.

4.3.1.1. Recovering EDL financial situation faces many challenges.

This challenge was commonly agreed by DEB, DPC and EDL. The GOL has been developing a policy to promote the use of electric vehicle in Laos. This promotion may impact most car dealers and fuel supply businesses. It is difficult for the government to come up with the policy to balance the benefits for these business

and EDL.

EDL has been upgrading transmission and distribution system to increase the flow of electricity from domestic supply projects to cities around the country and for exports. However, this effort needs huge investment cost. In order to effectively operate the transmission and distribution system, EDL still needs to upgrade its related infrastructures. The upgrade will help EDL connect its grid more reliably and efficiently with the grid system of the neighboring countries to facilitate the export of EDL surplus electricity. The upgrade will also help EDL distribute more electricity to more domestic consumers.

EDL has been working very hard and managed to complete sale agreements to export its electricity more to Vietnam, Malaysia, Singapore, Myanmar, and Cambodia. The government also studies the possibility of promoting the use of electric vehicles and investment promotion policy for cryptocurrency mining to increase the domestic consumption of electricity. EDL has been in negotiation with the World Bank for its assistance in EDL study to upgrade its distribution system.

4.3.1.2. Domestic supply developers cannot pay their financial obligations to the GOL because they have not received payment from EDL.

This issue was accepted by EDL and reconfirmed by DEB, DPC. EDL has not been able to fully pay the electricity cost purchased from the domestic supply projects because of two causes. Firstly, the depreciation of Kip (Lao currency) impacts EDL ability significantly to pay the cost of power purchased from the developers and loan repayment. EDL has also been suffered from the huge depreciation of the local currency (Kip) since 2021. Most EDL electricity is sold to

domestic consumers which pay in Kip with the same price approved by the government in early 2021. By that time, the exchange rate was 9000 Kip per US Dollar. However, EDL buys and pay for electricity in US Dollar. In addition, most EDL debt repayment is made in US Dollar. The current rate is roughly 18000 Kip per US Dollar. Therefore, this situation has reduced EDL payment capability by 50%.

To address the first cause, EDL, DEB and DPC understood that it would be very difficult because the demand for US Dollar has been on the rise domestically and internationally due to high inflation in many countries and limit supply of commodities such as energy, food, fertilizer in the world market. In addition, tourism industry, which is one of the main drivers of foreign currencies into Lao economy, has been recovering slowly due to the down turn of the global economy. The short term solution could be that the GOL postpones the payment of some of the taxes which the developers have the obligations to reduce the burden on both EDL and the developers. The long-term solution can be found in an economics theory of demand and supply of Kip and foreign currencies. The GOL has to take measures to increase the demand of Kip by the developers and lenders, while at the same time, to control their demand for US Dollar. The measures to increase supply of US Dollar or other interchangeable currencies into EDL is also needed. Serious discussion among the concerned authorities and experts is needed to identify such measures.

The second cause was that there was not enough demand or market for EDL electricity which leads to EDL inability to sell enough power to recover its cost of power purchased from the developers. EDL has more electricity (approximately 4500 MW) than it can actually sell (2000 MW). The domestic and foreign demand

of electricity from EDL grid system has been increasing very slowly. EDL system has surplus electricity and EDL cannot buy more electricity. This situation may continue because the regional and world economy is slowing down.

DEB and EDL suggested that the short-term solution for the second cause could be that the government temporarily stops approving new power projects to save the resource for the better developers or other convincing types of investment or businesses to continue attracting investments and currencies into Lao economy. The GOL should also provide strong support to increase power sale by EDL to wider and market in ASEAN. EDL should also research and co-invest with potential investors to utilize the surplus energy in EDL grid for other type of products or businesses.

4.3.1.3. Some foreign disagreement with hydropower development projects in Laos.

DEB, DPC, DEPP and Suhardiman, Geheb (2021) raised the international community concern about hydropower development in Laos. For example, International River, an international NGO, protested against the development of hydropower projects in the mainstream of the Mekong River with some allegations. These authorities also said that some foreign governments, such as the USA, Vietnam and Cambodia, also expressed their concerns on the development of hydropower projects in the mainstream of the Mekong River. The GOL and the developers hired internationally recognized engineering firm (Compagnie Nationale du Rhone or CNR) as the independent review of the projects to address all of these concerns and allegations. The review was based on the standard of Xayaburi Hydropower Project which was technically engineered and designed by European

standard and accepted by the Mekong countries.

Even though the development of hydropower projects in Laos has been under Lao territory and Lao sovereignty, it is important that the GOL takes this challenge into account and ensure that the implementation of PSHD is in accordance with the international laws and treaties which Laos is the party to, especially the Mekong Agreement which was signed by the GMS countries in 1995. The GOL also needs to ensure transparency of the development process and sustainability of the projects which subsequently ensure the long-term benefit to the GMS region and ASEAN.

Another concern raised by DOF was that the World Bank filed complaints to the GOL due to the increased approvals of hydropower development projects in the national protected areas where the World Bank and its partners funded the activities for protecting and enriching biodiversity of the area and the World Bank and the international organizations of the EU also provided financial and technical assistance to protect key national protected areas of Laos from 2008 under REDD+ (Reduce Emissions from Deforestation and Forest Degradation) program.

This action can be assumed that the West has been maintaining their strong presence and increased their influence to counter the expansion of Chinese projects in Laos. Therefore, this situation can be a challenge for the GOL to run the policy which can balance between the momentum of hydropower development pushed by the Chinese developers and the environmental protection supported by the West.

4.3.1.4. The district authorities were not provided enough capacity to handle mitigation works of project social impacts.

The developers in the interviews agreed that there were some district authorities that had never experienced or involved in any hydropower project development.

However, they were trained or informed enough of their duties, obligations and works for the project before the start of resettlement process. Therefore, it was difficult for them to work with the developers to address the social impact issues effectively.

This issue must be addressed seriously and accordingly because poor outcome of resettlement work should never happen because PAP are the people who sacrificed their properties and well-being to make way for the projects. Therefore, the district authorities must be well trained or informed of all necessary skills and knowledge to fulfill their duties because these authorities are the one working very close with the PAP. Proper workshops or consultation about the rights, obligations and entitlement of the developers, the GOL and the PAP must be held for the district authorities before the commencement of the resettlement.

4.3.1.5. Regulating reservoirs around the country in systematic way will be challenging.

DEPP and DEISM stated that recently, there have been 71 hydropower reservoirs in Laos and there will be more from 2023 to 2028. Effectively management and operation of these reservoirs is crucial to the success of the sustainable development of hydropower in Laos as it will ensure full optimization of power generation, flood control, environmental impact mitigation, irrigation in dry seasons and navigation. MEM has an important mandate to manage reservoirs of hydropower projects around the country. However, MEM has limit personnel of water management background or experiences and the laws and regulations to back up the implementation of river management are also limited. The causes have to be addressed accordingly.

The limitation of competent personnel can be addressed by applying the human resource development theory. This theory starts with creating working environment which can enable and maintain the potential or talent staff for the job. After that, the human resource development budget must be set aside. Additional competent personnel must be recruited when necessary. In addition, it is also important to plan and implement the short-term, medium-term and long-term capacity building activities for the staff. These activities can be carried out with assistance from the relevant international organizations. The agency also needs to provide sufficient technology to enable high performance of the limit number of staff.

4.3.1.6. Laws and regulations are enforced unequally among different developers.

The developers participated in the interviews agreed that the concerned authorities enforced laws and regulations unequally among different developers. Some developers received special treatment or waiver on the same matter while the other did not.

On the other hand, the officials of DEB, DOE, DOF, DEPP who participated in the interviews and Middleton (2022) also agreed that many violations of the environmental and social obligations and mitigation measures have remained unsolved or penalized because there has not been clear mechanism on how carry out law enforcement on the violations. Most violations have been addressed on case by case basis without constant and fixed procedures. If this challenge is not addressed, the current and future violations will keep growing and the related environmental and social impacts will not be mitigated and more unforeseen consequences may emerge.

The solution can be that the GOL establish the specific responsible agency for law enforcement in the power sector because this sector contributes greatly to the national revenue. Strong and effective law enforcement in the sector will lead to fairness, transparency and satisfaction of all developers. To ensure its success, this agency must also have dedicated personnel with strong legal knowledge. The agency needs a clear human resource development program. It should start with creating working environment which can enable and maintain the potential or talent staff for the job. The agency needs to set aside the human resource development budget. It may needs to recruit additional personnel if necessary. The agency must also plan and implement the short-term, medium-term and long-term capacity building activities for the staff which can be conducted with assistance from the relevant international organizations. The agency must also have sufficient technology to enable high performance of the limit number of staff.

The concerned authorities and the developers must strongly support and apply the Guideline on Standard Operating Procedures of Hydropower Development Project which details clearly the tasks, obligations and timeframe for each stage of hydropower development projects. This guideline can reduce the misunderstanding or wrong doing by both sides which can lead to the reduction of violation of the concerned laws and regulations of the power sector.

4.3.1.7. The concerned authorities have had limit personnel to accommodate the increasing workload of hydropower development projects.

DEB, DEPP, DEISM, DOE, DOF, DONREI and Jusi agreed that the workload on the concerned authorities has been increasing since there are a lot of hydropower

development projects in each development stage, which require close review, monitoring, inspection, coordination, negotiation, approvals and law enforcement. However, the number of staff for these duties has remained the same or decreased in the concerned authorities. This situation has led to less cooperation and coordination among the authorities to effectively carry out their respective duties in PSHD such review and approving FS, ESIA and BD related documents, monitoring, inspection and enforcement of developer obligations under the related laws and agreements with the government.

They suggested a solution that the concerned authorities must increase their productivity and improve their work operation. In addition, incentives are also necessary to increase the morality and productivity of the staff because the cost of living has increased but their wages are still the same.

The long-term solution can be that the concerned authorities have a human resource development program. The human resource development theory suggests that the working environment must be created to enable and maintain the potential or talent staff for the job, after that the human resource development budget must be set specifically. If necessary, more personnel must be recruited. The authorities also need to plan and implement the short-term, medium-term and long-term capacity building activities for the staff. These activities may be helped by seeking assistance from the relevant international organizations. It is also important to provide sufficient technology to enable high performance of the limit number of staff.

4.3.1.8. Most developers lack knowledge and understanding of the laws and regulations.

All of the officials participated in the interviews agreed that most developers

did not pay enough attention to update their understanding and knowledge of the concerned laws and regulations on hydropower development. This made it difficult for the concerned authorities and the developers to conduct the project development activities smoothly and in timely manner. This situation even required the concerned authorities to give extra efforts and time to explain and correct the inconsistency created by the developers with the laws and regulations. It also affected the work schedule of the other projects in line of the same process.

In some cases, due to the urgency of the project development schedule, especially the financing and construction schedules, the developers tried to seek shortcut and pushed the government to speed the process. The government in most of these cases had no choice but to rush the process with the developers in order to keep up the development schedule of the projects. This became a problem since it could be interpreted as non-compliance with the concerned laws and regulations. The solution lies in the strong law enforcement.

4.3.1.9. The concerned authorities went through too many institutional arrangement.

DEB, DOE, DONREI, DPC and Jusi (2011) expressed that most concerned authorities have not had stable institutional arrangement during the past 10 years. This issue was shown by the fact that there were always new staff assigned by the concerned authorities to work with the others. Their cooperation was not very efficient to each other to effectively carry out their respective duties in PSHD such review and approving FS, ESIA and BD related documents, monitoring, inspection and enforcement of developer obligations under the related laws and agreements with the government.

For example, MONRE has been through a lot of institutional reshuffle and staff rotation. Many concerned departments have lost many staff who have a lot of experiences and skills for works related to monitoring compliance by the developers of their obligations on environmental and social impact mitigation. In addition, these departments had to give a lot of efforts to train the new staff moved from the other departments. This situation has made their performance and its staff inconstant and could also affect the monitoring the environmental and social obligations of the developers. The solution that these department could do was to provide internal training, on-the-job training and peer-to-peer training.

4.3.1.10. The concerned authorities have overlap of duties on monitoring obligations of the developers.

All of the officials and the developers participated in the interviews agreed that there has overlap of duties among some agencies and it was also raised by Jusi (2011). For example, monitoring of resettlement obligation has still been unclear whether it should be the duty of MAF or MEM because the Law on Electricity states that MEM is the leading authority while the Law on Resettlement provides for MAF to be the lead. Another example is that the Law on Electricity states that MEM and MPI are the authorities to represent the government in signing the agreements between the government and the developers in respect of hydropower development projects while the Law on Investment Promotion provides for MPI to be the sole representative of the government in signing these agreements.

This issue has to be dealt with accordingly. Strong and comprehensive discussion among the concerned authorities must be held to find the common understanding and agree on the overlapped duties.

4.3.1.11. Staff performance in the concerned authorities has decreased.

The officials participated in the interviews and Jusi (2011) agreed that some officers in the concerned authorities have performed less and lacked enthusiasm and motivation to do their duties. They reasoned that the cost of living increased while their wage has been still the same and insufficient to cover the cost of living. The concerned authorities need these staff because they have been well developed and their skills are essential. For example, formal communication with most developers are to be made in English as agreed by the government and the developers. However, English skill of staff of the concerned authorities is not strong enough for this communication. The poor performance of the staff could affect monitoring of the obligations of the developers negatively and this might lead to foreseen or serious consequences.

The solution can be that the concerned authorities must increase their productivity and improve their work operation. In addition, incentives are also necessary to increase the morality and productivity of the staff because the cost of living has increased but their wages are still the same.

The long-term solution can be that the concerned authorities have a human resource development program. The human resource development theory suggests that the working environment must be created to enable and maintain the potential or talent staff for the job, after that the human resource development budget must be set specifically. If necessary, more personnel must be recruited. The authorities also need to plan and implement the short-term, medium-term and long-term capacity building activities for the staff. These activities may be helped by seeking assistance from the relevant international organizations. It is also important to provide sufficient technology to enable high performance of the limit number of staff.

4.3.1.12. The requirement for developers to increase income of the project affected people (PAP) by 100% is not practical to achieve.

The developers participated in the interviews express concern of the tasks during the planning stage is the concerned agencies and the developer negotiate and agree on the developer obligations on mitigation of the project social impacts. One of the obligations is to require the developer to carry out livelihood restoration activities until the family income of PAP increase by 100% within 10 years after the project starts commercial operation. This obligation is difficult to fulfill. The government should review whether this requirement is still applicable.

This issue was minor. It must be the responsibility of the developers to improve the livelihood and the well-being of the PAP because they were the people who sacrificed their properties and well-being to make way for the projects to be developed. However, the GOL, the developer and the PAP of the future projects must hold serious consultation on the livelihood restoration programs which can produce or help achieving the 100% increase target faster and more effective.

4.3.2. Issues in Planning Stage

With respect to the planning stage, the interviews with the concerned authorities such as Department of Energy Policy and Planning, Department of Environment, Department of Energy Industry Safety Management, Department of Planning and Cooperation, Department of Forestry and the project developers such as Nam Emoun Hydropower Project, Nam Kong 3 Hydropower Project showed some critical issues which specific the planning stage and can be summarized as below.

4.3.2.1. Feasibility Study

4.3.2.1.1. Developers made up data.

DEPP and DEISM stated that in order to make the projects feasible to the GOL and the potential off-taker, bankable to the potential lenders, profitable to the potential joint-venture, most of the developers made up study data for their projects. For example, some projects had water data and the location which technically fit for the design of generation pattern which usually do not generate much electricity during dry seasons but the developers made up the data to make the pattern more attractive, such as increase the amount of water data in the dry seasons.

This was an issue because the GOL and the off-taker had to spend unnecessary amount of time and efforts to review and correct the data and to bring the design back to its optimistic capacity. If this overdesign were approved, the projects would not produce electricity up to the capacity, the off-taker would not receive electricity into the power grid as planned, and the government would not receive financial benefits as agreed which could impact projected government revenue.

To address this issue, MEM must give extra efforts when reviewing the feasibility study documents. Therefore, sufficient personnel and incentives are also needed for MEM and the local staff who are involved in the process.

4.3.2.1.2. Developers of hydropower projects for domestic supply did not perform enough their obligations for feasibility study.

DEPP stated that most of the developers of the projects for domestic supply did not make satisfactory performance. Their feasibility study reports were not satisfactorily in compliance with the requirement of LEPTS, FS TOR. They usually skipped many steps and procedures in these regulations. This was an issue because MEM had to work harder and gave extra efforts to review and correct the reports to

be more reliable with data, details and design.

In addition, the Law on Electricity allows the provincial authorities to authorize the development of hydropower projects with installed capacity of up to 5 MW and such approval is subject to MEM approval of the technical features of the projects. When reviewing, MEM found that most of the feasibility study reports prepared by the developer of the projects authorized by the provincial authorities had poor quality and inconsistent with the laws, regulation, guidelines and engineering requirements.

This was an issue because poor quality feasibility study could lead to problems such as wrong design, severe safety issues, incorrect generation assumption, wrong ESIA and mitigation measures, wrong benefit sharing. To address this issue, the provincial authority must give extra efforts when review the feasibility study documents of these projects.

4.3.2.1.3. Concerned authorities had misunderstanding about approving FS and ESIA.

DEPP expressed concern about MONRE wants to start the environmental and social impact assessment (ESIA) only after the feasibility study (FS) to be approved by MEM. This was an issue as it made the planning stage longer unnecessarily and delay the project development. Technically, these two activities can be conducted in parallel and this could be very helpful as MEM could best optimize the project design in early stage to minimize the environmental impacts from the project.

4.3.2.2. Environmental and Social Impact Assessment (ESIA)

4.3.2.2.1. MONRE has not had specific ESIA regulation for hydropower development projects.

DOE expressed that MONRE has not had a specific regulation on ESIA for

hydropower development projects. Recently, MONRE has applied the general ESIA regulation to the hydropower projects which has not been working well because the impact assessment for the hydropower projects needs different and specific technical requirements and standards. To address this issue, the specific regulations must be established.

4.3.2.2.2. Insufficient dissemination and consultation of the ESIA documents and environmental and social obligations of the developers to the concerned authorities and project affected people.

DOE expressed similar opinion with Jusi (2011) about issue of insufficient dissemination of regulations. The issue is that technically, after the ESIA documents were approved and the environmental and social obligations of the developers were agreed by the government, MONRE needed to organize dissemination and consultation about these documents and obligations of the developers with the concerned authorities and the project affected people (PAP). This was to ensure that they were well informed about the duties for the project development and the compensation, budgets and entitlement from the project developers to them. However, due to the limit number of personnel and budget, MONRE could not conduct these activities as scheduled.

To address this issue, workshops for the concerned agencies and the project affected people must be organized to disseminate the documents and agreements between the government and the developers on the environmental and social obligations and mitigation measures.

4.3.2.2.3. The cooperation and coordination of the concerned authorities on ESIA activities were not enough.

DOE expressed that in order to push the developers to perform ESIA and

related activities effectively, MONRE needed strong cooperation from the concerned authorities because these activities needed involvement and facilitation from these authorities. For example, MONRE needed MEM to confirm the technical specification of the hydropower projects (the scale and volume of the reservoir, power generation pattern, etc.), MAF to confirm the impacts on the forests and biodiversity and the mitigation measures, and the local authorities to confirm the number of PAP and properties and the mitigation measures as agreed by the PAP.

However, the cooperation from the concerned authorities had not been in the level they should had. In some cases, when MONRE requested for their review and feedback on the ESIA documents, they did not reply or just gave too general feedback or comments. When MONRE hosted meetings with the authorities to review the documents, their representatives did not contribute enough to the meetings, seeming that they did not prepared. Most mitigation measures for environmental and social impacts of the hydropower projects requires involvement of the concerned authorities to carry out together. However, the agencies usually carried out separately on their own way.

4.3.2.2.4. The performance by the domestic supply project developers of their ESIA obligations were not satisfactory enough.

DOE had similar opinion with Middleton (2022) about the issue of improper ESIA. Most of the developers of the projects for domestic supply did not make satisfactory performance enough. This was because their lenders and off-takers did not post serious environmental and social obligations on the developers and MONRE did not have enough personnel with the capacity to monitor and enforce compliance.

The similar issue happened to MAF as well. MAF claimed that Lao developers

did not use enough efforts to fulfill their duties related to assessment of the project impact on the forest areas either. They did not study enough their duties and the procedures required by the laws related to the assessment of the impacts on the forest and biodiversity.

This made it difficult for them and MAF to carry out the assessment in accordance with the laws and in timely manners. Therefore, some Lao developers decided to seek other solutions which can make the process faster. This did not give MAF sufficient time to effectively assess and calculate the compensation amount for forest rehabilitation and biodiversity offset, and watershed management budget. It was also difficult for MAF to effectively negotiate and propose realistic impact mitigation measures and other duties of the developers for forest management and biodiversity offset for the project areas in timely manners.

4.3.2.3. Negotiation and Approval of Concession Agreement

4.3.2.3.1. Contradiction between Law on Electricity and Law on Investment regarding approving development of hydropower projects.

The Law on Electricity and the Law on Investment Promotion have some provisions which state different process and conditions for authorizing the development of hydropower projects. For example, Law on Electricity requires both MEM and MPI to be the signatory on behalf of the government to enter into the agreements related to the development of hydropower projects between the GOL and the developers. However, Law on Investment provides only MPI to represent the government in such agreements. This has become a problem because MPI ignored the provisions of the Law on Electricity and follows only the Law on Investment. They confused the developers and the other concerned authorities. They created doubts and required legal interpretation whether the agreements entered by

only MPI and the developers could have been legally binding.

4.3.3. Issues in Construction and Operation Stages

With respect to the construction and operation stages, the interviews with the concerned authorities such as Department of Energy Business, Department of Natural Resources and Environment Inspection, Department of Energy Industry Safety Management, Department of Forestry, Electricite du Laos (EDL) and the project developers such as Nam Theun 1 Hydropower Project, Nam Theun 2 Hydropower Project, Huay Ho Hydropower Project showed some critical issues which specific the construction and operation stages and can be summarized as below.

4.3.3.1. Most Lao developers did not fulfill the conditions to make the concession agreements effective.

DPC and DEB stated that according to the concession agreements, after signing the CA, the government and developers have some conditions to fulfill in order to make the agreements effective and binding. However, the Lao developers did not perform well enough on this matter. Law on Electricity requires that the construction activities can be conducted only after the CA becomes effective and other relevant approvals are obtained prior to the commencement of the construction. However, some of these developers requested for approval from the government to start the construction earlier. Due to the urgency of the financing and selling schedule, the government has to approve the request.

To address this issue, MEM reported the issue to the government and the government instruction for addressing the issue was different among the projects due to their specific conditions. The long-term solution should be stated in the

relevant laws, prohibiting any construction until the concession agreements are effective and violation must face severe punishment.

4.3.3.2. Power generation of the projects for domestic supply is lower than planned output.

DEB and EDL stated that because EDL system has surplus electricity and EDL cannot buy more electricity, the domestic supply projects have to reduce their power generation output. This can be addressed only when EDL can sell more electricity.

4.3.3.3. Time-consuming process for approval of the budget for field inspection.

DONREI expressed about the issue that the government process for approving the budget for field inspection activities took a lot of time and steps. This situation delayed the inspection and it is even worse in some cases in which the concerned authorities were forced to postpone the inspection to the year after because the request for the budget cannot be approved within the requesting year.

The concerned authorities have been in the process of revising its regulations and procedures to improve the approving process.

4.3.3.4. Dispute between the upstream projects and downstream projects.

The developers in the interviews expressed their concerns about water release management. Each developer released water from the power plant for the sake of the maximum benefit to their projects only. There has not been a common regulation to control the release which fair to all projects in the same rivers. If this situation was to be left unsolved, then it might lead to more disputes between the developers of these projects and this might cause some serious impacts such flood on the people,

infrastructure and projects in the downstream areas. If the government does not have such regulation in place in the right time, such impacts will be difficult for the government to address.

4.3.3.5. Limit areas for resettlement of project affected people.

DEB, DOE and DONREI stated that according to the Law on Environmental Protection, the project affected people (PAP) who lost their houses and/or land for income generation are entitled to compensation in the form of resettlement to new better quality housing and community infrastructure, land for income generation activities and livelihood restoration programs which have been agreed by the PAP and the developers and to be provided by the project developers free of charge to the PAP. However, finding the land with right conditions for such purpose was always difficult because Laos is mountainous and environmental requirements was high. Some of the resettlers were not happy with the resettlement areas as the areas were small and difficult to travel around and to generate satisfactory amount of income.

It must be the responsibility of the developers to improve the livelihood and the well-being of the PAP because they were the people who sacrificed their properties and well-being to make way for the projects to be developed. The GOL, the developers and the PAP must hold serious consultation on the livelihood restoration programs which match the limit areas.

4.3.3.6. Ineffective utilization of project funds

The developer participated in the interviews expressed their concerns about the improper use of the project funds. According to the concerned laws, the developers provided the funds to the concerned authorities in accordance with the laws and CA

for conducting activities to protect the forest in the catchment area of the project and community development programs of communities in project vicinity. However, the concerned authorities had not been active enough to use the funds transparently and effectively to the objectives of the funds. Deforestation is on the rise in the catchment areas. Basic infrastructures of the communities are not well maintained.

4.3.3.7. Resettlers keep changing their compensation preferences,

DEB and DONREI expressed similar opinion with Zachau (2015) about the issue livelihood restoration for the PAP. For example, the developers, concerned authorities and PAP conducted a series of consultation on the social impacts, resettlement, compensation and other mitigations before reaching their agreement on the matters. However, when it came to the time to start the resettlement, some PAP changed their mind. They want to have cash compensation instead of the resettlement program which was agreed to relocate them to new better quality housing and community infrastructure, land for income generation activities and livelihood restoration programs. The concerned authorities and developers did not want to give cash compensation because the past experiences showed that the PAP went broke after a year because they did not capitalize the cash compensation to investment of sustainable job or income generation activities.

Therefore, the solution should be that MEM and the concerned agencies had to give extra efforts to convince the PAP. Even though the process takes time and delay the resettlement in some projects, the GOL, the developers and the PAP must hold serious consultation on the livelihood restoration programs which match the limit areas.

4.3.3.8. Developers do not give enough efforts to implement livelihood restoration programs

DEB and DONREI expressed similar opinion with Zachau (2015) about the issue livelihood restoration for the PAP. For example, livelihood restoration programs include activities to improve income generation (usually between 5 to 10 years after starting commercial operation of the project by increasing the PAP income by 100% of their original income before the resettlement), health and environmental conditions in the resettlement areas. They are parts of the developers' social obligations. The local authorities were responsible for monitoring and enforce compliance of these obligations.

The livelihood restoration activities have been agreed by the developers and the resettlers during the consultation of the social impacts. However, most of the developers have not been active enough. Some of them blamed the lack of revenue from their sale of electricity to EDL to fully fund the activities. Due to the lack of close monitoring and limit personnel of the local authorities, some of the developers are just not very keen to fulfill their obligations although they did not have any financial constraint. This delays and impacts the livelihood of the PAP.

MEM addresses this issue on case by case basis with the developers.

4.3.4. Transfer stage

The Law on Electricity and the Guideline on Standard Operating Procedures of Hydropower Development Project states that this process starts after the independent party and the concerned authorities initiate the pre-expiry inspection of the assets 72 months prior to the scheduled date of expiry of concession period. However, implementation for this stage has no major issues yet because there is no

projects being in this stage. The closest project to be transferred is Huay Ho Hydropower Project which is set to be in 2029 according to the CA.

The Department of Energy Business and the developer of Huay Ho Hydropower Project, however, raised their concern about the transfer which could be ineffective and unorganized because there has not been a regulation or guideline to facilitate the transfer process.

Chapter 5. Conclusion

5.1. Summary

In conclusion, this research reviewed the implementation of the Policy on Sustainable Hydropower Development (PSHD) of the Government of Laos. It was an exploratory research which focused only on the formation, adoption and implementation of the policy life cycle which covered objectives, inputs and outputs of the policy. However, the review did not attempt to make the full evaluation of the policy to assess the effectiveness and impacts of the policy. In addition, this research was also an important opportunity to investigate and discuss whether the concerned authorities and the hydropower project developers had correct understanding of PSHD and carried out their respective PSHD duties accordingly. The research also investigated and identified the issues and challenges that the authorities and the developers during the implementation of PSHD and discussed the possible solutions.

To achieve the objectives, this research collected qualitative data through virtual interviews with the relevant staff of the concerned authorities and selected developers of the hydropower projects in Laos as the primary source. The research also collected secondary data from the sources such as statutory laws and regulations, reports and other relevant documents available online and provided by the interviewees. The collection was conducted from August to September 2022.

The main question was designed to explore how PSHD has been conducted. To achieve that exploration this research investigated and explained (1) why PSHD was established, (2) how the concerned authorities and the hydropower project developers implemented their duties and (3) what issues or challenges in the implementation of the policy and what measures or actions were or will be taken in

response to the issues or challenges.

The findings illustrated that the GOL issued the Prime Minister's Decree on Adoption of the Policy on Sustainable Hydropower Developer. This decree stressed that the hydropower sector played an important role for achieving the objectives of the National Strategy on Poverty Eradication and Economic Development and for supporting the regional energy demands. The GOL was eager to develop hydropower as an export commodity and to supply the domestic demand. To realize that, the GOL promoted the investment by domestic and foreign individuals and entities into hydropower development projects in conjunction with watershed protection. The GOL also wanted to ensure that operation of the projects is consistent with the national socio-economic development plan, safe, effective, economic and sustainable, and that the potential adverse impacts on the project affected people, natural resources, and environment are effectively mitigated.

Therefore, the GOL initially established the National Policy on Environment and Social Sustainability of Hydropower Sector in Lao PDR (NPSH) in 2005 to direct the hydropower sector. The key laws and regulations were subsequently developed to support the policy. Institutional arrangement was also established to exercise the policy, which included Ministry of Energy and Mines (MEM), Ministry of Natural Resources and Environment (MONRE), Ministry of Agriculture and Forestry (MAF). After that, NPSH was updated during 2013-2014 to cover the technical, engineering aspects as well as the environment and social impacts. Therefore, the name of the policy was changed to the Policy on Sustainable Hydropower Development (PSHD) and adopted by the Prime Minister of Lao PDR under the Decree no. 02/PM, issued on 12 January 2015.

The findings also discovered that the policy promoted development of

hydropower projects in Laos as businesses which applies the form of independent power producer (IPP). This means that the projects were developed by entities who submitted their development proposals to the concerned authorities. Once approved, the entities developed and ran the projects and its related business activities in the scheme of BOT (build, own, operate and transfer) under a concession right. This right, in summary, permitted the entities to build, own, operate and transfer the projects to the GOL after the end of the concession right. The right was stipulated in a concession agreement (CA).

The relevant laws and regulations laid out the development of the hydropower projects under the IPP scheme through 4 subsequent stages, namely, planning stage, construction stage, operation stage and transfer stage. Each stage required completion of its specific activities to be completed by the concerned authorities and/or the developers in order to advance to the next stage.

The findings, in addition, discovered many issues and challenges in the implementation of PSHD and suggested many solutions. The issues and challenges were divided into four categories. Firstly, the common challenges were the issues or challenges commonly found in each development stage of PSHD and those which did not belong to any of the development stages but were agreed to have negative impacts on the success of PSHD. The secondly, third and fourth categories were the issues specifically happened in the planning, construction, operation and transfer stages of many hydropower projects. Unexpectedly, the interviewees specifically raised their concerned on some critical issues and challenges.

For example, domestic supply developers could not pay their financial obligations to the GOL because they did not receive sufficient payment from EDL (a state-owned enterprise which is the sole off-taker and distributor of electricity in

Laos); there were some foreign disagreement with hydropower development projects in Laos; the district authorities were not provided with enough capacity to handle mitigation works for the social impacts; law enforcement was not strong enough; the concerned authorities had limit personnel to accommodate the increasing workload of hydropower development projects; most developers of the domestic supply projects lacked knowledge and understanding of the concerned laws and regulations; and the concerned authorities and developers also suggested many solutions of their own opinions and the author discussed and proposed possible solutions to these issues and challenges.

In general, the research objectives were satisfactorily met as the findings obtained necessary data for answering the main research question which was to review the implementation of PSHD which was set up in accordance with the policy life cycle theory. In addition, its sub-questions which were set up based on social research exploratory method led the research to obtain necessary data which allowed the review to explain why PSHD was formed, how it was established and implemented and what issues and challenges happened in the implementation and the measures taken to address them.

5.2. Research Limitation

Despite the achievement of its objectives, this research was unavoidable of its limitations. Firstly, the research had time constraint to conduct all of the planned interviews. All of the interviews were planned to be held virtually between the interviewer and the interviewees. Therefore, the time for arranging each interview took quite a period of time. After submitting the request for interviews to the authorities or the developers, their internal approving process ranged from 3 days to

2 weeks before assigning the staff to participate in the interviews. Because the interviews could not be conducted physically, the research could only arrange the interviews to be at night time or on weekend and most of the interviewees felt more comfortable to do the interviews in their free time. In addition, it took quite amount of time to compile the interview transcripts because each interview used different interview questions.

The second limitation was the lack of participants from the developer side. The research originally planned to interview 20 projects. However, only 5 projects assigned their staff to participate in the interviews. Some projects did not reply the requests. The other projects advised the research to make new requests through Ministry of Energy and Mines. However, the research could not agree with the advice because this research was conducted in the name of SNU which should be independent from any authority.

This research also had limited access to English literatures or articles related to the research topic because there was limited study on the review of the implementation of PSHD or related issues. In addition, the sources for secondary data were mostly in Lao language.

It was difficult to use a questionnaire form in each interview because different interviews with different participants needed different questions which were more specific to the duties of the concerned authorities, the hydropower projects and the context of the interviews to obtain answers to the research questions.

Finally, there was a limitation to discuss and analyze the solutions to the issues and challenges which the research found. This was because most of the issues and challenges were different and unique and required different application of knowledge to address them specifically such as finance, environment, community

development, forestry, engineering, management, administration and public policy.

5.3. Policy Recommendation

This research found that the implementation of PSHD has led to the development of the power sector in Laos such as the increase of generation capacity from 30 MW in 1971 to almost 10,000 MW in 2020, 95% electrification of total households, electricity as the national export commodity and many more projects under construction and planning stages. Therefore, continuation of PSHD must be favorable to the GOL.

However, the research also found the issues and challenges of the implementation. Many of them have been agreed by the concerned authorities and the developers that they require urgent attention and solutions. Therefore, the continuation of PSHD must be in parallel with addressing the following issues.

EDL has surplus electricity because EDL has contract to purchase approximately 4500 MW but EDL has been able to actually sell only 2000 MW. The domestic and foreign demand of electricity from EDL grid system has been increasing very slowly. If EDL cannot sell more with substantial amount, it will not have enough revenue to pay for the electricity it purchase from the developers. If the developers do not receive sufficient payment from EDL, they will not be able to pay their financial obligations to the GOL and the GOL planned revenue will be impacted.

Strong law enforcement is needed because many violations of the laws and regulations and non-compliance by the developers have remained unsolved. If this challenge is not addressed, the current and future violations and non-compliance will keep growing and more unforeseeable consequences may emerge.

The concerned authorities had limited competent personnel to accommodate their increase workload such as close review, monitoring, inspection, coordination, negotiation, approvals and law enforcement. This situation has led to less cooperation and coordination among the authorities to effectively carry out their respective duties in PSHD such review and approving FS, ESIA and BD related documents, monitoring, inspection and enforcement of developer obligations under the related laws and agreements with the government. Some serious consequences may happen if this situation remained unsolved.

There were some district authorities that had never experienced or involved in any hydropower project development. However, they were not trained or informed enough of their duties, obligations and works for the project before the start of resettlement process. Therefore, it was difficult for them to work with the developers to address the social impact issues effectively. This issue must be addressed seriously and accordingly because poor outcome of resettlement work should never happen as the PAP are the people who sacrificed their properties and well-being to make way for the projects and the government policy.

5.4. Recommendation for Further Research

This research was to review the implementation of PSHD. Such review should have covered both the perspectives of the concerned authorities and the developers about this policy. However, the research could manage to interview only 5 projects out of the planned 20 projects. Therefore, further study about the perspective of the developers are needed. In addition, this research found that PSHD had led to the increase of export of electricity from Laos to its neighboring countries and most developers received loan foreign financial institutes. Therefore, the further study

should cover the inputs from the foreign off-takers and lenders on the policy. It is also important to study further the geopolitical influence on PSHD by the investments from China, Vietnam and other countries in hydropower development sector and by the environmental protection projects of the World Bank, the EU and other development partners.

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Appendix A: List of Power Plants from 1970 to 2019

No.	Names of Power Plants	Province	Installed Capacity (MW)	Annual Generation (GWh/year)	Construction Completed Year	Markets
1	Nam Dong	Luang Prabang	1	5	1970	EDL
2	Xe Labam	Champasak	5	21	1970	EDL
3	Nam Ngum 1 + Extension	Vientiane	235	1,221	1971	EDL
4	Xe Set 1	Salavan	45	134	1991	EDL
5	Nam Ko	Oudomxay	2	8	1996	EDL
6	Nam Theun-Hinboun + Extension	Khammouan	440	2,691	1998	IPP Export (Thailand)
7	Huay Ho	Attapeu	152	450	1999	IPP Export (Thailand)
8	Nam Leuk	Xaysomboun	60	218	2000	EDL
9	Nam Mang 3	Vientiane	40	150	2009	EDL
10	Xe Set 2	Salavan	76	309	2009	EDL
11	Nam Lik 1-2	Vientiane	100	435	2010	IPP Domestic (EDL)
12	Nam Theun 2	Khammouan and Bolikhamxay Provinces	1,075	6,000	2010	IPP Export (Thailand) and Domestic (EDL)
13	Nam Hnone	Bokeo	3	12	2011	SPP Domestic (EDL)
14	Nam Phao	Bolikhamxay	2	9	2011	SPP Domestic (EDL)
15	Nam Tha 3	Luang Namtha	1	6	2011	SPP Domestic (EDL)
16	Nam Ngum 2	Xaysomboun	615	2,300	2012	IPP Export (Thailand)
17	Nam Ngum 5	Xiangkhouang and Luang	120	507	2012	IPP Domestic (EDL)

		Prabang Provinces				
18	Tad Salen	Savannakhet	3	17	2012	SPP Domestic (EDL)
19	Nam Xong	Vientiane	6	25	2012	EDL
20	Nam Long	Luang Namtha	6	37	2013	SPP Domestic (EDL)
21	Mit Lao Bagasse Fired Power Plant	Savannakhet	5	58	2013	SPP Domestic (EDL)
22	Xe Namnoy 1	Champasak	15	101	2013	SPP Domestic (EDL)
23	Nam Hnouang	Bolikhamxay	60	316	2013	IPP Domestic (EDL)
24	Xe Kaman 3	Xekong	250	1,000	2014	IPP Export (Vietnam)
25	Nam Ngiep 3A	Xiangkhouang	44	152	2014	IPP Domestic (EDL)
26	Nam Sen (Tadlang)	Xiangkhouang	5	25	2014	SPP Domestic (EDL)
27	Nam Sana	Vientiane	14	50	2014	EDL
28	Houay Lamphan gnai	Xekong	88	480	2015	EDL
29	Nam Khan 2	Luang Prabang	130	538	2015	EDL
30	Hoang Anh Bagasse Fired Power Plant	Attapeu	20	105	2015	IPP Domestic (EDL)
31	Hongsa Coal Fired Power Plants	Xayaboury	1,878	12,582	2015	IPP Export (Thailand) and Domestic (EDL)
32	Nam Ngiep 2	Xiangkhouang	180	732	2015	IPP Domestic (EDL)
33	Nam Xan 3B	Xaysomboun	45	174	2015	IPP Domestic (EDL)
34	Nam Xan 3A	Xiangkhouang	69	278	2016	IPP Domestic (EDL)
35	Nam Ou 2	Luang Prabang	120	546	2016	IPP Domestic (EDL)
36	Nam OU 5	Phongsaly	240	1,049	2016	

37	Nam Ou 6	Phongsaly	180	739	2016	
38	Xe Namnoy 6	Champasak	5	27	2016	SPP Domestic (EDL)
39	Nam Mang 1	Xaysomboun	64	225	2016	IPP Domestic (EDL)
40	Nam So	Xiangkhouang	3	12	2016	SPP Domestic (EDL)
41	Nam Beng	Oudomxay	36	145	2016	IPP Domestic (EDL)
42	Nam Khan 3	Luang Prabang	60	240	2016	EDL
43	Xe Set 3	Champasak	23	82	2017	EDL
44	Nam Chiane (Nam Chae)	Xiangkhouang and Xaysomboun Provinces	104	448	2017	EDL
45	Solar Power Plant (Naxaythong 1)	Vientiane Capital	5	18	2017	EDL
46	Xe Kaman 1	Attapeu	290	1,096	2017	IPP Export (Vietnam)
47	Xe Kaman-Sanxay	Attapeu	32	131	2017	
48	Nam Peun 2	Houaphanh	12	68	2017	SPP Domestic (EDL)
49	Nam Ngiep 2C	Xiangkhouang	15	33	2017	SPP Domestic (EDL)
50	Nam Nga 2	Oudomxay	15	63	2017	SPP Domestic (EDL)
51	Nam Phay	Xaysomboun	86	420	2017	IPP Domestic (EDL)
52	Xekatom-Xenamnoy 2	Champasak	13	79	2017	SPP Domestic (EDL)
53	Nam Kong 2	Attapeu	66	263	2017	IPP Domestic (EDL)
54	Nam Phai	Vientiane	3	11	2018	SPP Domestic (EDL)
55	Houay Po	Salavan	15	60	2018	SPP Domestic (EDL)
56	Nam Ngum (Kengkhouan)	Xiangkhouang	1	6	2018	SPP Domestic (EDL)

57	Solar Power Plant (Pakngum 1)	Vientiane Capital	7	11	2018	EDL
58	Solar Power Plant (Sangthong)	Vientiane Capital	2	3	2018	EDL
59	Solar Power Plant (Naxaythong 2)	Vientiane Capital	5	8	2018	EDL
60	Solar Power Plant (Sikhottabong)	Vientiane Capital	5	8	2018	EDL
61	Solar Power Plant (Pakngum 2)	Vientiane Capital	8	11	2018	
62	Nam Lik 1	Vientiane	64	265	2018	EDL
63	Houay Chiat	Champasak	8	38.56	2018	IPP Domestic (EDL)
64	Nam Ngiep 2B	Xiangkhouang	15	76	2019	EDL
65	Nam Sor	Bolikhamxay	5	24	2019	SPP Domestic (EDL)
66	Nam Chae 1	Xaysomboun	15	64	2019	SPP Domestic (EDL)
67	Savannakhet Sugar Bagasse Fired Power Plant	Savannakhet	2	5	2019	SPP Domestic (EDL)
68	Sun Paper Holding Laos Biomass Fired Power Plant	Savannakhet	16	80	2019	SPP Domestic (EDL)
69	Nam Kab	Xaysomboun	12	55	2019	SPP Domestic (EDL)
70	Mekong Xayaboury	Xayaboury	1,285	7,370	2019	SPP Domestic (EDL)
71	Nam Ngiep 1	Bolikhamxay	272	1,515	2019	IPP Export (Thailand)
72	Nam Ngiep 1 Downstream Regulation Dam	Bolikhamxay	18	105	2019	IPP Domestic (EDL)
73	Don Sahong	Champasak	260	2,009	2019	IPP Domestic (EDL)
74	Nam Pha-Hnai	Xaysomboun	20		2019	IPP Domestic (EDL)
75	Xepian-Xenamnoy	Attapeu and Champasak Provinces	410	2,023	2019	IPP Export (Thailand) and Domestic (EDL)

76	Nam Tha 1	Bokeo and Luang Namtha Provinces	168	759,40	2019	IPP Export (Thailand)
77	Nam Peun 1	Houaphanh	26	72	2019	IPP Domestic (EDL)
78	Nam Ou 1	Luang Prabang	180	710	2019	IPP Export (Thailand)
	Total		9,979	51,318		

Abstract in Korean

라오스 정부의

지속 가능한 수력 발전 정책구현 검토

Souksakhone PHILAVANH

서울대학교

행정대학원

글로벌행정전공

본 V 논문은 라오스 정부(GOL)의 지속 가능한 수력 발전 정책(PSHD)의 이행을 검토했습니다. 이것은 탐색적 연구였습니다. PSHD의 형성 단계, 채택 단계에서 PSHD 구현 단계까지의 PSHD 수명주기를 검토했습니다. 따라서 PSHD에 대한 완전한 평가는 아니었습니다. 이 연구는 질적 데이터만을 사용했습니다. 관련 당국의 공무원과 라오스의 일부 수력 발전 프로젝트 직원을 인터뷰하여 수집한 기본 데이터입니다. 관련 법률, 규정, 보고서 및 기타 관련 문서를 연구하여 수집한 2차 데이터입니다.

조사 결과는 또한 라오스 정부가 수출 상품과 국내 수요 공급을 위해 수력 발전 전력을 개발하기를 원했음을 보여주었습니다. 라오스 정부는 수력 발전 프로젝트에 대한 투자를 장려했습니다. 이러한 프로젝트는 (1) 안전한 유역 보호, (2) 경제적이고 지속 가능한 운영, (3) 효과적인 영향 완화

조치, (4) 국가 사회경제적 개발 계획을 지원해야 합니다. 프로젝트에는 효과적인 영향 완화가 있어야 합니다.

2005년 라오스 정부는 수력 발전 부문 환경 및 사회적 지속 가능성 국가 정책(NPSH)을 수립했습니다. NPSH는 2013-2014년에 개정되었습니다. 개정판은 기술적, 환경적, 사회적 측면을 다루었습니다. 2015년에 NPSH는 PSHD로 변경되었습니다.

지속 가능한 수력 발전 정책은 기업으로서 수력 발전 프로젝트를 개발하는 데 중점을 둡니다. 이러한 사업은 독립 전력 생산자 모델(IPP)에 의해 운영됩니다. 이 모델은 개발자의 개발 제안으로 시작됩니다. 제안서는 관련 당국에 제출됩니다. 제안서가 승인되면 개발자는 개발 활동 및 관련 비즈니스 활동을 수행합니다. 이러한 활동은 양허권의 적용을 받습니다. 양허권을 통해 개발자는 프로젝트를 건설, 소유, 운영하고 라오스 정부에 이전할 수 있습니다. 양허권은 양허 계약(CA)이라는 계약에 법적으로 규정되어 있습니다. 수력발전사업 개발은 4단계(계획, 건설, 운영, 이전)로 진행됩니다. 각 단계는 다음 단계로 진행하기 위해 특정 활동을 완료해야 합니다.

PSHD는 1971년 30MW에서 2019년 거의 10,000MW로 발전 용량을 급격히 증가시켰습니다. 전기 주택의 수는 1971년 3%에서 2019년 95%로 증가했습니다. PSHD는 또한 전력을 국가 수출 상품으로 전환했습니다. 그것은 건설 및 계획 단계에서 더 많은 프로젝트를 위한 경로를 만들었습니다.

그러나 이 연구를 통해 PSHD에 대한 많은 과제도 확인되었습니다.

예를 들어, 국내 공급 개발자는 EDL로부터 전액을 지급받을 수 없기 때문에 라오스 정부에 재정적 의무를 지불할 수 없습니다. EDL은 유틸리티입니다. 국내 소비 전력의 유일한 유통업체입니다. 또 다른 문제는 라오스의 수력 발전 프로젝트에 동의하지 않는 일부 국제 사회도 있었다는 것입니다. PSHD 구현은 또한 법 위반에 대한 처벌을 시행하는 데 어려움이 있습니다. 따라서 PSHD의 지속은 문제에 대한 조치와 병행되어야 합니다.

주제어 : 양허 협정, 관계 당국, 개발자, 전력 구매 계약, 프로젝트 개발 계약, 양해각서

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