

YANGON UNIVERSITY OF ECONOMICS

DEPARTMENT OF COMMERCE

MBF PROGRAMME

EFFECT OF FOREIGN FINANCING IN SE DAW GYI

HYDROPOWER PROJECT

MA TIN TIN NWET

MBF (4th BATCH)

DECEMBER 2018

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**EFFECT OF FOREIGN FINANCING IN SE DAW GYI
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A thesis submitted as a partial fulfillment towards the requirements for the degree of
Master of Banking and Finance (MBF)

Supervised by

Submitted by

Prof. Dr Soe Thu

Professor

Department of Commerce

Yangon University of Economics

Tin Tin Nwet

Roll No. 78

MBF- 4th Batch

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ACCEPTANCE

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ABSTRACT

Providing adequate and affordable electric power is essential for economic development, human welfare and better standard of living. The demand for power in a developing country enormous and is growing steadily. Myanmar has abundant energy resources, particularly hydropower and natural gas. The hydropower potential in the four main river basins of Ayeyarwaddy, Chindwin, Thanlwin and Sittaung, is estimated to be more than 100 GW. However, like many emerging markets, and indeed some more developed markets, government funds are currently over-stretched to implement the Power Projects. To execute the Power Projects, huge amount of investment amounts and capitals are required by Government. While Government should have to emphasis not only the infrastructure development, health, education and living standard, local government revenue is not enough and foreign financing is essentially important. It is increasingly recognized that the development of developing countries depends on the efficient foreign financing. Since 1975, International financial institutions provide different kinds of loans, aid and technical assistance to Myanmar Power sector. The major source of Myanmar borrowing for Power are International Monetary Fund (IMF), The Export-Import Bank of China, World Bank, Asian Development Bank and other regional banks, Organization for Economic Co-operation and Development (OECD) and multilateral private loans. In 1979, Asian Development Bank provided the Foreign Financing upon Se Daw Gyi Hydropower Projects for the Project implementation and it produced the electricity in 1989. This thesis attempt to study the foreign financing of Hydropower Sector in Myanmar and to examine the impacts of Foreign Financing on performance of Se Daw Gyi Hydropower in Myanmar.

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ABBREVIATIONS

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
BOT	–	Built, Own and Transfer
DACU	–	Development Assistance Coordination Unit
EGAT	–	Electricity Generating Authority of Thailand
EIA	–	Environmental Impact Assessment
FIRR	–	Financial Internal Rate of Return
GDP	–	Gross Domestic Product
GOM	–	Government of Myanmar
HPGE	–	Hydropower Generation Enterprise
HPP	–	Hydropower Plant
IPP	–	Independent Power Producer
IMF	–	International Monetary Fund
LNG	–	Liquid Natural Gas
MEPE	–	Myanmar Electric Power Enterprise
MIC	–	Myanmar Investment Commission
MNCOLD	–	Myanmar National Commission on Large Dams
MOA	–	Memorandum Of Agreement
MOAI	–	Ministry of Agriculture and Irrigation
MOE	–	Ministry of Energy
MOECAF	–	Ministry of Environmental Conservation and Forestry
MOEP	–	Ministry of Electric Power
MOF	–	Ministry of Forestry
MOGE	–	Myanma Oil and Gas Enterprise
MOEE	–	Ministry of Electricity and Energy
MOI	–	Ministry of Industry
MW	–	Mega Watt
OPEC	–	Organization of Petroleum Exporting Countries

PID – Partners in Development

CHAPTER I

INTRODUCTION

Foreign financing is an outstanding loan or set of loans that one country owes to another country or institutions within that country. Foreign financing also includes obligations to international financial institutions such as the World Bank, Asian Development Bank or Inter-American Development Bank. Total foreign debt can be a combination of short-term and long-term liabilities. Also known as external debt, these outside obligations can be carried by governments, corporations or private households of a country. Such assets span a wide range including: large components such as highways, airports, roads, transit systems, and railways; local, municipal components such as public education, public hospitals, police and fire protection, prisons, and courts; and critical components including water and sewer systems, public electric and gas utilities, and telecommunications

For a developing country, foreign financing is a double-edged sword: It carries tremendous potential for increased economic welfare. The experience of developing countries between 1973 and 1983, a period that may become known as the "decade of international debt," bears this out. On balance, the increased reliance of developing countries on international Financing appears to have been beneficial, but there is little question that this financing has fallen far short of its potential and, in some cases, has made borrowing countries worse off.

From 1974 to 1983, more than 80 percent of the net external financing for developing countries was in the form of credit, and two-thirds of this amount consisted of bank loans. Although there is nothing wrong with bank credit per se, several of its characteristics make it inappropriate for developing countries when it becomes such a large proportion of their external obligations. In particular, general obligation bank loans impose debt servicing requirements that bear a perverse relationship to a borrower's ability to pay, fail to shift specific risks to a broad "world capital market pool" from particular countries that are unduly exposed, do not require that Northern lenders, advisors, or trading partners take some responsibility for both the selection and execution of investment programs and projects, and concentrate the consequences of potential defaults in a narrow sector of world capital markets.

The Government of Myanmar (GOM) sincerely welcomes and appreciates the growing number of international Partners in Development (PID) such as World Bank, ADB, China Exim Bank and JICA, including but not limited to bilateral, multilateral and United Nations (UN) agencies, funds and programmes, development finance institutions, South-South, triangular and regional partnerships, export credit agencies, international philanthropic organizations, International Non-Government Organizations (INGOs) and others. International organizations are providing Loan to Myanmar in the field of economic, infrastructure, human resources development, agriculture, power, energy, technical transfer by means of technical cooperation projects, grant aid projects, Official Development Assistance (ODA) loans and others with different loan Terms and Conditions to find opportunities to provide development assistance to the country.

Whether on grounds of basic humanitarian responsibilities of the rich toward the welfare of the poor or because of a belief that the rich nations owe the poor nations conscience money for past exploitation, many proponents of foreign aid in developed and developing countries believe that rich nation have an obligation to support LDC economic and social development. There is no doubt that the least developed countries will need more assistance to escape from various circle of poverty.

1.1 Rational of the Study

The Republic of the Union of Myanmar (Myanmar) is one of the developing countries, which is a member of ASEAN located in the South East Asia. Myanmar shares borders with Thailand, Laos, China, India, and Bangladesh. It is resource-rich and strategically located between the People's Republic of China (PRC) and India, at the crossroads between East and South Asia. Myanmar's population is approximately 52 million, with more than 70% living in rural areas. The average electrification rates are too low comparing with neighboring countries especially Thailand, its electrification rate is about 99%. Per capita gross domestic product (GDP) is one of the lowest in Southeast Asia, at about \$715. Myanmar was ranked among the poorest countries (161 out of 180) by the International Monetary Fund and its ranking on the United Nations Human Development Index is also near the bottom of the list (149 of 187 countries).

Myanmar is the largest country in mainland Southeast Asia and it covers an area of 676,577 square kilometers (km²) with 2800 km of coastline along the Indian Ocean, bordering Bangladesh, India, China, Thailand and Laos. Its geostrategic position located between the People's Republic of China (PRC) and India, at the crossroads between East and South Asia. It is also a member of the ASEAN member countries, and is endowed with rich natural resources, including arable land, forests, minerals, natural gas, and freshwater and marine resources.

With more than 70% of Myanmar's population approximately 52 million, living in rural areas, Myanmar has much less energy especially electricity per person than most Asian nations and also has a lower households getting grid power than its neighbors. This lack of affordable energy security, except from high-priced diesel, creates higher costs and holds back economic growth. It also inconveniences 70% of Myanmar people who lack access to grid power and is a source of regional inequality greatly limiting wider economic development in most states and divisions. Myanmar's current power situation remains severely constrained. With low levels of electrification of around 35% and widespread curtailment of power to industrial and commercial consumers the demand for power is not adequately met.

As a key infrastructure component, power is vital to social and economic development. Its support of wide-ranging activities and services improves quality of life, increases labor productivity, and encourages entrepreneurial activity. Its stable supply of power allows households to improve living conditions, helping to meet heating, lighting, and cooking needs across income levels. And it is a key input in economic production, making goods and services across all economic sectors possible. It is also vital to basic social services such as education, health care, clean water supply, and sanitation. As such, access to affordable electricity can help developing countries meet the United Nations Millennium Development Goals.

Myanmar is rich in renewable and non-renewable natural resources and is known for its high level of biodiversity, oil, gas industries account for about 50% of government revenues but have relatively small impact on local economy. Myanmar has abundant energy resources, particularly hydropower and natural gas. The hydropower potential in the four main river basins of Ayeyarwaddy, Chindwin, Thanlwin and Sittaung, is estimated to be more than 100 GW. However, like many emerging markets, and indeed some more developed markets, government funds are

currently over-stretched to implement the Power Projects. There is simply not the cash available in the public purse to make the substantial investments required to upgrade Myanmar's power infrastructure in order to keep pace with its economic development.

The International Finance Corporation, the World Bank, the National Bureau of Economic Research and the International Monetary Fund play pivotal roles in the mediation of international finance. The World Bank, for example, provides finance and advice to assist middle-and-poor-income countries, while the IMF provides advice, policy recommendations and loans to its 189 member countries to promote economic stability and power sector development.

1.2 Objectives of the Study

The main objectives of this study are as follow;

- 1) To identify Foreign financing of Power Sector in Myanmar
- 2) To examine the effects of Foreign Financing on performance of Se Daw Gyi Hydropower Project in Myanmar.

1.3 Methods and Scope of the Study

Descriptive method will be used in this Study. Both Primary data and Secondary data will be used. Primary data are collected from Ministry of Electric and Energy and Ministry of Finance and Planning. Secondary data are carried out by literature review obtained by different sources, through different virtual libraries, books, articles, lecture notes and worldwide web sources. For the assumptions made, the study made usage of different materials and information given from the competent governmental structures, agencies and organizations. The macroeconomic data and all the other necessary data were taken or referred to other similar projects with similar characteristics done by World Bank, ADB Bank and China Exim Bank. This study uses Return on Investment (ROI) and also economic analysis used to realize the effects of Loan upon Power Sectors. This paper would like to emphasis the impact of foreign financing from the owner's point of view, (equity holder). This paper only focus the foreign financing conducted by MOEE during the period of 1970 to 2018.

1.4 Organization of the Study

This study consists of five chapters and the general framework is as follow: Chapter 1 is Introduction which covers Rationale of the Study, Objectives of the Study, Methods of the Study and Organization of the Study. Chapter 2 is Theoretical Background Sector. Chapter 3 is Overview of Foreign Financing In Power Sector of Myanmar. And, Chapter 4 is Analysis of Foreign Loan Financing in Se Daw Gyi Hydropower Project. Finally, Chapter 5 is Conclusion which describe the findings, suggestions and further study.

CHAPTER II

THEORETICAL BACKGROUND

This chapter describes the theories will be used as a framework for this study. In order to study and understand the foreign financing, the nature of foreign financing and its function have to be defined first. Importance of foreign financing and measurement of foreign financing are discussed.

2.1 The Nature of Foreign Financing and its Function

A developing country or Lease Developed Country (LDC) cannot sustain the national development without any foreign financing or aids or supports. So, they play a crucial role in developing country and it becomes more and more important hence forward. Most of the developing countries usually try to change from the agricultural based economy to industrial based economy. Without foreign development assistance, a developing country cannot switch itself to industrialized country. The growth in developing countries would create development, and that it would be achieved through large investment of capital, coupled with technical expertise.

Many developing countries have difficulty in mobilizing domestic resources for power investment partly for reasons specific to the sector, partly because political pressure keeps rate below appropriate levels, and Partly because domestic savings in general are low and financial markets are almost non-existent. Power sector operations in many developing countries are not efficient, both from an operating cost and investment standpoint. Power entities have to varying degrees been beset by the identical problems – too little managerial autonomy and accountability, cumbersome procedures, uncompetitive salaries, employment of redundant staff, etc. These problems compound the effects of sub-optimal tariff have serious implications for the financial viability of the entities and their ability to mobilize-e domestic resources for investment.

According to Modern Monetary Theory, public debt is an expression of the accumulated previous budget deficits which have added financial assets to the private sector, providing demand for goods and services. The underlying theory was that

growth in developing countries would create development, and that it would be achieved through large investments of capital, coupled with technical expertise. As per this theory, many nations took on public debt to finance large infrastructural capital projects such as highways or large hydroelectric dams.

Foreign financing a movement of loan capital beyond the national boundaries of countries between the entities of international economic relations, providing currency and commodity resources under conditions of recurrence, urgency and interest payment. External debt is the total private and public debt owed by a country. In this era of economic development where the supply of domestic savings is low, the common phenomenon for developing countries has become the accumulation of external debt. Before the 70's external debts of nations are literally low and loans are being disbursed to developing nations by specified United Nations agencies like IMF, World Bank (International Bank for Reconstruction and Development) and regional development banks with low interests to enhance countries development projects and importation of capital goods. Subsequently in the late 70's and 80's other financial institutions embarked on same duty of these specialized UN agencies recycling OPEC "petrodollars" and issuing all-purpose loans to developing countries to provide balance of payments support and expansion of export sectors. There are different kinds of foreign financings.

Firstly, foreign financing is the kinds of public capital which is the amount of financial obligations of a country owed to foreign creditors for unpaid foreign loans and interests. Long-term foreign financing obligations of a country include the external public (official) debt, which is the amount of obligations of central and local state bodies to external creditors for unpaid loans and interest. External creditors can be foreign governments, central banks, governmental bodies, international and regional monetary and financial organizations. It is the aggregate body of a government-owned assets that are used as a means for productivity. Such assets span a wide range including; large components such as highways, airports, roads, energy, transit systems and railways; local municipal components such as public education, public hospital, police and fire protection, prisons and courts and critical components including water and sewer system, public electric and gas utilities and telecommunication.

Secondly, the foreign financing is the state-guaranteed debt, which is an obligation of private firms, banks, companies, where the guarantor of payment is the country. Thirdly, private non-guaranteed debt which is a debt of private borrowers that is not guaranteed by a country. It occurs when a borrower receives bank and other loans by means of purchasing debt securities in the international stock market.

International credit is involved in the turnover of capital in all stages, mediating its transition from one form to another one: from cash to a productive, then to commodity and to cash again. External financing enables developing countries to,

1. enhance the potential national income over time by investing in profitable projects that cannot be financed with domestic resources,
2. accelerate or delay domestic consumption relative to anticipated national income,
3. smooth domestic consumption in response to sharp
4. fluctuations in income or required outlays, shift risks associated with particular development strategies or economic ventures to foreign investors or governments,
5. shift responsibility for the selection or management of investments, and
6. obtain concessional transfer of resources

2.2 Importance of Foreign Financing

Foreign financing plays a critical role in international trade and inter-economy exchange of goods and services. It is important for a number of reasons. The importance of international crediting lies in a fact that due to it there is the redistribution of capital among countries in accordance with the needs and opportunities of more profitable use. Foreign finance has grown in stature due to globalization. It helps understand the basics of all international organizations and keeps the balance intact among them. An international finance system maintains peace among the nations. Without a solid finance measure, all nations would work for their self-interest. International finance helps in keeping that issue at bay. International finance organizations, such as IMF, the World Bank, etc., provide a mediators' role in managing international finance disputes. Foreign finance is major role in the economic development of a country is not played by external financing

(loans and assistance), but by internal resources and a balanced economic policy. It focuses on external capital leads in the long term to a greater dependence of the socio-economic development of the country on unfavorable external events. External financing can play a positive role only when it complements and reinforces a healthy domestic economic policy.

The reasons for countries accruing of loans are for the development and poverty alleviation of their respective economies and nations. The reasons behind the loans are for development and to facilitate industrial technological advancement. The ultimate objective is to increase the standard of living of the generality of the people.

There are several ways in which debt can affect a countries development. First, it is important to understand that government debt is a way of raising funds, keep the balance between revenues and expenditures while at the same time evenly offsetting the construction funds. Second, adjusting a country's industrial structure, regional structure as well as promote a stable development of the national economy. Finally, debts will help improve the liquidity when it comes to international payments.

2.3 Measurement of Foreign Financing

Financial analysis is conducted to evaluate the profitability of the Project from the viewpoint of the implementing organization. The financial analyses aim to examine the viability of the Project by calculating the Return on Investment (ROI) ROI is a performance measure used to evaluate the efficiency of an investment or compare the efficiency of a number of different investments. ROI tries to directly measure the amount of return on a particular investment, relative to the investment's cost. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment. The return on investment is calculated as net income divided by the cost of an investment) or $ROI = (\text{Gain from Investment} - \text{Cost of Investment}) / \text{Cost of Investment}$.

Economic analysis evaluates project costs and benefits from the perspective of the economy/society. Economic analysis evaluates the local economic benefit and cost such as Job creativity, Infrastructure and industry development, Improvement of local services for enhanced water supply, schools and healthcare facilities, agricultural productivity and marketing, for example through enhanced irrigation systems. Public

economic benefit can provide a substantial boost for the macro economy such as increased investment and national income and environmental benefits for example better air pollution.

CHAPTER III

OVERVIEW OF FOREIGN FINANCING IN POWER SECTOR

IN MYANMAR

In this chapter, it is presented with seven parts which describe Purpose of foreign Loan financing, foreign financing in Myanmar during 1980 to 2017, regulatory framework and regulatory authorities, loan Procedures and loan approval process, kinds of foreign financing, foreign financing terms and conditions and power projects in Myanmar with foreign financing during 1970 to 2017.

3.8 Purpose of Foreign Loan Financing

Electricity shortages and supply disruptions are a major concern. Accumulated delays in investments in power infrastructure, over-reliance on seasonal hydropower production, together with a rapid increase in electricity demand (which tripled over the last decade), resulted in large electricity shortages. Maximum peak demand will continue to rise rapidly. It is estimated to reach 14,800MW in high growth case in 2030. Improvement of electrification ratio which is 38% in 2016 is also an urgent issue in order to facilitate fair economic and social development in Myanmar. To respond the rapid increase of power demand and requirement of rural electrification, it is necessary to formulate the power sector development plan from the medium and long term view based on the appropriate composition of power generation sources in consideration of environmental and social issues.

In order to emphasis the shortage of Electricity issue in Myanmar, the Government of Myanmar (GOM) sincerely welcomes and appreciates the important contribution that their assistance continues to make toward the overall socio-economic development of Myanmar. The major sources of Myanmar borrowing are the Paris Club, International Monetary Fund (IMF), The Export-Import Bank of China, World Bank, Asian Development Bank and other regional banks, and multilateral private loans.

Myanmar is assessed to remain at low risk of external debt distress by International Monetary Fund and International Development Association. Under the baseline scenario, public and publicly guaranteed (PPG) external debt burden

indicators are projected to remain below their indicative thresholds. Similarly, total public debt is also projected to remain below benchmark in the baseline, though stress tests lead to breaches in the event of an extreme shock and fiscal slippage. Internal revenues and external loans are two main variables that determine the direction of a nation's stability of the entire performance of the nation's economy.

The Government of Myanmar borrow money or ask for the foreign financing from local or abroad with the approval of the State for the following matters.

- a) To finance the Union budget deficits;
- b) To finance projects and investments such as Power and Infrastructure Projects
- c) To refinance outstanding debt or repay a loan prior to its due date of repayment;
- d) To replenish, if necessary, the foreign reserve fund maintained by the Central Bank;
- e) To repay liabilities remaining under publicly guaranteed debt;
- f) To lend as Government loan or credit to Region or State Governments, Development Committees, State-Owned Economic Enterprises and any other entities approved by the State.
- g) To immediately protect, mitigate or eliminate affects caused by a natural or environmental disaster or any other emergency situations of the State; and
- h) To finance any other matter as stipulated in the Union Budget Law approved by the State

Among these purpose, Government of Myanmar use the big amount of foreign financing for power project such as Hydropower, Gas, LNG, Solar and Coal Power Projects which require the long construction period and huge capital amount.

3.2 Foreign Financing in Myanmar during 1980 to 2017

Myanmar take foreign financing from neighbouring countries and International Financial Institutions. According to the Union Parliament's Joint Bill Committee, Myanmar foreign debt totaled over USD 9.4 Billion of June 2017. Before 1988, Myanmar's foreign debt amounted to about USD 4.27 billion. By 2017, the figure had grown to over USD 9.4 billion. Most of the loans have repayment periods of 10 to 40

years, including suspension period. Myanmar Foreign Financing as of June 2017 is shown in Table 3.1

Table 3.1

Myanmar Foreign Financing as of June 2017

Countries	In million USD	In percent of GDP	Composition (in percent)
Total foreign financing	9,487	33%	100%
China	3,999	14%	42%
Japan	2,130	7%	22%
ODA	916.84	3%	10%
Germany	692.72	2%	7%
World Bank	1012.9	4%	11%
ADB	516.9	2%	5%
Others	219	1%	2%

Source: Union Parliament's Joint Bill Committee, 2018

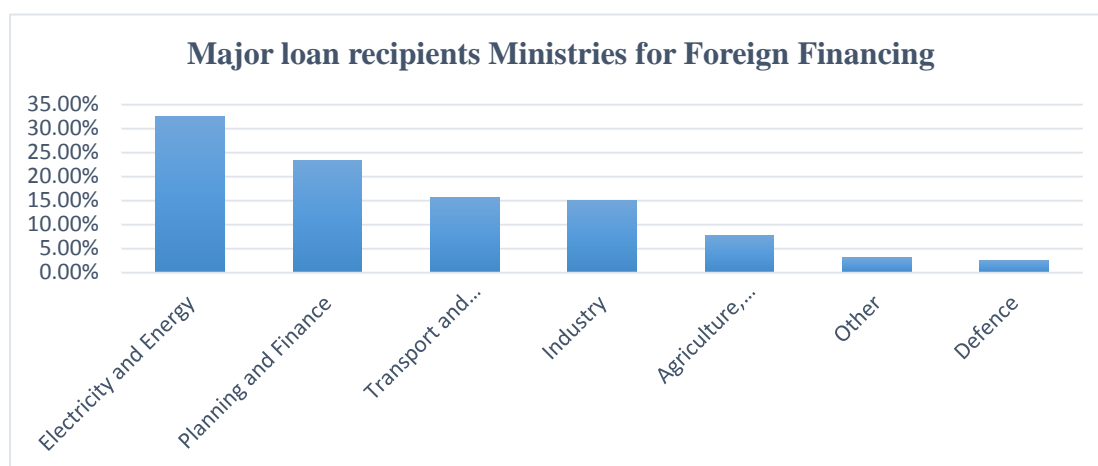
Myanmar owes China about 3.999 billion – nearly half of the country's total foreign debt. Myanmar owes USD 2.13 billion to Japan, equivalent to 22 percent of Myanmar's foreign debt. In 2012, Japan agreed to write off USD 1.74 billion to help the country advance its democratic process. Myanmar owes USD 916.84 Mil to the ODA, International Bank for Reconstruction and Development (IBRD) Loans and IDA credits and public and publicly guaranteed debt extended by the World Bank Group.

Myanmar owes USD 692.72 MUSD to Germany. Berlin forgave more than half a billion euros of debt in 2014.

Myanmar recorded a government debt equivalent to 33 percent of the country's Gross Domestic Product in 2017. Government Debt to GDP in Myanmar averaged 86.88 percent from 1998 until 2017, reaching an all-time high of 216.04 percent in 2001 and a record low of 29.91 percent in 2014. Debt-to-GDP ratio is the ratio between a country's government debt (measured in units of currency) and its gross domestic product (GDP) (measured in units of currency per year). A low debt-to-GDP ratio indicates an economy that produces and sells goods and services sufficient to pay back debts without incurring further deb.

According to the Union Parliament’s Joint Bill Committee, 2018, the Ministry of Electricity and Energy receives 32.53 percent of the loans, followed by the Ministry of Planning and Finance with 23.38 percent. Explore the following chart in Figure 3.1 to see what proportion of total lending the various recipients receive.

Figure 3.1
Major loan recipients of Foreign Financing



Source: Union Parliament’s Joint Bill Committee, 2018

3.3 Regulatory framework and Regulatory authorities

The key laws governing project financing and power generation projects in Myanmar are categorized. Depending on project sectors, the requirements to obtain approvals from relevant ministries vary, in addition to obtaining prior permits or approvals from the government or the Myanmar Investment Commission (MIC). There are various government ministries, departments and state-owned economic organizations under the relevant ministries, each with jurisdiction over specific project sectors.

3.3.1 Regulatory Framework

Laws that have been enacted in Myanmar can be divided into six main categories according to the period in which they were enacted:

- Colonial Period Laws (before 1948). The laws enacted during this period are called Acts. All the Acts enacted during this period and up until 1954, are compiled and were originally known as the Burma Code. They are now called the Myanmar Code, and are in 13 volumes.

- Parliamentary Laws (1948 to 1962). After 1954, enacted laws were published annually.
- Revolutionary Council Laws (1962 to 1974). Laws from this period have been compiled into a three-volume set.
- Pyithu Hluttaw Laws (1974 to 1988). The socialist legal system continued during this period. Laws enacted during this period were published annually.
- State Law and Order Restoration Council Laws (1988 to 1997). The socialist legal elements were abolished in 1988. Since then, a market-based economic system has been adopted. The legal system still has its roots in the common law system. The laws promulgated during this period were published annually.
- State Peace and Development Council Laws (1997 to present). The market-based economic system continues, and there is annual publication of laws enacted.
- The New Electricity Law was enacted in 2014, which replaces its predecessor of 1984, governs the power generation sector. It distinguishes between generation, transmission, distribution and use of electricity and requires that permission must be granted by the relevant authorities for these activities. A new electricity regulatory commission has been established with responsibility for formulating policy, preparation tariffs, advising MOEP, setting standards and performing inspections, but it has only very recently started operations. It is expected that more detailed provisions are issued later by way of implementing regulations.

3.3.2 Regulatory Authorities

To date, the majority of the large scale infrastructure projects in Myanmar have been financed by offshore lenders. The primary authority regulating offshore financing is the Central Bank of Myanmar (CBM). In accordance with the Foreign Exchange Management Law 2012 (FEML) and its implementing rules under Notification 7 of 2014, the CBM's prior approval is required for any offshore financing. In accordance with the Foreign Exchange Management Law 2012 (FEML), project companies must also have the CBM's prior approval before opening any offshore bank account.

For the purpose of implementing power projects that receive offshore financing, the following government agencies and departments play a crucial role:

- Ministry of Electricity and Energy (MOEE), which has been formed recently following the merger of the former Ministry of Electric Power and the then Ministry of Energy. Among other responsibilities, the MOEE oversees the issuance of electricity-related permits.
- Electric Power Generation Enterprise (EPGE), which has also been formed recently. Among other responsibilities, it will act as the off-taker on power-related projects in place of the MEPE.
- Myanmar Oil and Gas Enterprise (MOGE) which, among other responsibilities, oversees the supply of natural gas to power-related projects.
- Ministry of Planning and Finance (MOPF), which has been formed recently following the merger of the former Ministry of National Planning and Economic Development and the then Ministry of Finance.
- Ministry of Agriculture, Livestock and Irrigation (MOALI).
- Ministry of Planning and Finance (MOPF).
- Myanmar Investment Commission (MIC).

3.4 Loan Procedures

The standard loan procedure, with some variations depending on the type of the loan and the nature of the project, consists of the following 8 steps.

1) Loan Request:

The prospective recipient government officially requests the government of Financing providing countries, to extend a loan for the project, and submits supporting documents, such as a Feasibility Study (F/S), an Implementation Program (I/P) and other related documents.

2) Loan Appraisal

The Ministry of Finance and Economy (MOFE), receiving the loan request, decides whether it contributes to the industrial development or economic stabilization of the recipient country. If the project in question is deemed appropriate, the Ministry asks the government of Financing providing countries to appraise it. The Bank gathers necessary information from relevant institutions, and prepares an appraisal report which evaluates the possibility of implementation, feasibility, scope of assistance terms and conditions of the loan, etc.

3) Decision on Government's Assistance:

The Ministry of Finance and Economy makes a final decision on extending assistance to the proposed project, taking into consideration the Bank's appraisal report and the opinion of relevant Ministries.

4) Governments' Agreement and Arrangement:

The Ministry of Foreign Affairs and Trade (MOFAT) notifies the assistance policy to the prospective recipient government of the assistance policy. If it is accepted, an Agreement and a separate Arrangement for implementing the loan takes place between the two governments, and the amount and other principal terms and conditions are agreed to.

5) Loan Agreement:

When negotiations on detailed terms and conditions of the loan are completed, a Loan Agreement (L/A) stating the specific financing terms and conditions and other necessary matters is signed between the Bank and the Borrower. The Loan Agreement takes effect when the Borrower fulfills the conditions precedent.

6) Procurement:

The Borrower proceeds with procuring goods and services needed for the project when the Loan Agreement comes into force. The procurement should be made in accordance with the guidelines concluded between the Bank and the Borrower. After the the government of Financing providing countries 'assistance policy has been agreed to, the Borrower signs a contract with suppliers and/or consultants under the Bank's prior approval, before signing the governments' Agreement/Arrangement and the Loan Agreement to expedite implementation.

7) Disbursement

Disbursement of the loan is in accordance with the procedure stipulated in the Loan Agreement. Generally, when the purchasing contract has been approved by the Bank, and a Letter of Credit (L/C) is opened, the Bank subsequently issues a Letter of Commitment (L/Comm). Disbursements are made against the L/C upon receipt of the required documents evidencing equipment shipped, performance of contract, and so on. At this stage, the consultant to the Borrower normally provides service as stipulated in the Loan Agreement.

8) Evaluation:

The primary aim of project evaluation is to find out how many objectives have been realized. For post-evaluation, the government of Financing providing countries requires the Borrower to submit a Project Completion Report as soon as the project is completed. A systematic analysis of the experience gained during its execution helps to better plan and implement future projects.

3.5 Kinds of Foreign Financing

In order to the development of Power sector, the GOM welcomes the diversity of Partners in Development (PID) active in Myanmar and notes that the varied mixture of development assistance delivery modalities (including blended modalities) they bring can ensure a stronger and more resilient approach to financing Myanmar's overall development.

1) Pooled, Trust Fund and Other Similar Modalities

Where PID are not in a position to provide budget and/or sector budget support, the GOM encourages the delivery of development assistance through Programmed Based Approaches (PBA) and/or Multi Donor Trust Fund (MDTF) mechanisms. Such forms of assistance enable the efficient delivery of a comprehensive and coordinated set of activities directly aligned with national, sub-national and sector level development priorities. The GOM shall be represented at a senior level in PBA/MDTF governance structures, and shall ensure substantive engagement in all stages of the programme cycle.

2) Project-Based Aid

The GOM recognises that project-based development assistance can also be valuable in a range of circumstances including in the delivery of assistance to hard-to-reach communities, in supporting the GOM's delivery of complex reforms and investments, and in building longer-term institutional capacities. The GOM particularly welcomes project-based aid that priorities innovative approaches to service delivery that may have the potential for wider rollout/scaling up in partnership with Government Entities.

3) Grant Assistance

To maximize the volume and quality of development assistance, and to ensure continued stability in its public finances, the GOM encourages development assistance to be provided in the form of grants wherever possible, rather than concessional loans or any other form of credit.

4) Concessional Loan Assistance

While Myanmar is not currently considered to be at risk of debt stress, the GOM is committed to maintaining Myanmar's debt at a manageable level. Therefore, with respect to loan financing, the GOM has a strong preference for the provision of development assistance in the form of concessional loans. In such cases, concessional loan financing must be used strictly in support of national development priorities.

Barring exceptional circumstances, concessional loan financing should not be used for: embedded technical assistance; or feasibility studies or other pre-investment analysis prior to implementation. In such cases, the GOM maintains a strong preference for the above needs to be financed through grant assistance.

In general, concessional loans should only be used to finance initiatives where the economic rate of return is determined by GOM to be higher than the borrowing cost. However, the GOM may also choose to use concessional loan financing for socio-economic initiatives that bring about long-term economic benefits.

5) Untied Aid and Local Procurement

Tied aid (i.e. the procuring of imported goods and services which are tied to a funding country or organization) severely limits the ability of both the GOM and PID to pursue value for money procurement. Therefore, the GOM encourages all PID to provide fully untied assistance. PID proposing wholly or partially tied assistance shall make this clear within Grant or Concessional Loan Financing Agreements, or similar agreements, and shall include a clear justification for why tied aid is being proposed in that instance.

6) Commodity-Based Assistance

The GOM appreciates commodity-based development assistance provided by PID. However, the GOM also notes that such goods are often procured within the provider country, transported to Myanmar and then distributed in an uncoordinated manner, all at significant cost on both sides. Such practices risk distorting local

markets. Therefore, the GOM requests that, to the greatest extent possible or in cases involving a specific request from a Government Entity, commodity-based assistance be localized.

7) Technological Sustainability and Interoperability

Where development assistance involves the application and/or transfer of ICT, this technology shall be cost effective, secure, untied, well-supported, future-leaning, and capable of interoperability with other relevant systems. Wherever possible, the GOM has a preference for the use of open source technologies that are both evidence-based and appropriate to the Myanmar context, with the commensurate investment in the building of capacities required to use and maintain any technologies acquired.

8) Humanitarian assistance

The GOM accepts the ultimate responsibility of the State to provide for the humanitarian needs of our people. The GOM is committed to continued dialogue with local and international humanitarian partners to improve the effectiveness and coordination of humanitarian assistance. In this regard, further guidance shall be developed by the DACU, in consideration of the differences as well as the interlink ages between humanitarian assistance and development assistance.

Government Entities are encouraged to conduct their own due diligence with regard to unsolicited development assistance proposals to ensure that proposing entity has secured/reliable access to the financial and technical resources required to implement the proposal.

3.6 Foreign Financing Terms and Conditions

While GOM take the foreign financing from major sources of Financing such as China, Japan (JICA ODA), Koera EXIM Bank, Asian Development Bank and World Bank, there are different kinds of loan criteria such as Interest rate, Repayment period, Grace period, Payment currency and others fees. Different kinds of foreign financing Terms and Conditions are seen in Table 3.2.

The interest rate is the rate of interest applicable to the Foreign Financing. The interest rate of China Exim Bank and China Development Bank are higher than remaining foreign Bank such as JICA, Koera Exim Bank, ADB and World Banks.

Maturity Period is the period commencing on the date on which this Agreement becomes effective and ending at the defined date of repayment. Maturity Period include the Grace Period and the Repayment Period. The Borrower is obligated to repay to the Lender all the principal amount drawn and outstanding under the Facility, all the interest accrued thereon and such other amount payable by the Borrower. When the Borrower defaults to make the payment on its maturity, maturity fees should have to be paid but some foreign financings do not ask for that fees.

A commitment fee is a charge that a lender imposes on a borrower as compensation for keeping a line of credit open. A management fee is a fee charged to a borrower for processing an application for a loan. China Exim Bank and China Development Bank mostly used that kinds of fees.

Repayment period is the time between the first payment on a loan and its maturity. Repayment period for JICA Loan, Koera Exim Bank and ADB are longer than China Banks.

A grace period is the provision in most loan and insurance contracts that allows payment to be received for a certain period of time after the actual due date. Mostly, the grace period of Koera Exim Bank allows the borrower than other banks. Semiannual repayment schedules are generally used by Banks.

In order to assist local manufacturers in exporting the machinery and other capital equipment, enhance the development of relevant domestic industries, the foreign financing banks such as the Export-Import Bank of the China tie the borrowing countries by using the policy to purchase the materials and products from China with foreign financing. Mostly, China Exim Bank use that kinds of policy for using 50% of loan amount from China and remaining 50% are allowed to buy from other countries. World Bank Loans and ADB loans are free from that kinds of policy.

While the related Ministry invite the Tender by using the foreign financing, the financing providing countries set the tender policy which allow only the domestic industries and companies from foreign financing providing countries.

Table 3.2
Foreign Financing Terms and Conditions

No.	Description	China (EXIM Bank)	China (CDB Bank)	Japan (Jica ODA Loan)	Korea (EXIM Bank EDCF Loan)	ADB	World Bank
1	Interest rate	2% - 4.5%	4.5%	0.01%	0.01% to 2.5%	1% to 6% in 1980s and 1% to 1.5% in later of 2000 year.	0.5 % to 1%
2	Maturity Premium	1%	-	Original interest rate+2%	-	-	-
3	Commitment fees	0.25% - 0.4%	0.4%	-	-	-	-
4	Management fees	0.25% - 0.4%	0.4%	-	-	1%	-
5	Repayment (year)	25	25	40	40	10 to 25	20 to 40
6	Grace period (year)	5	5	10	15	5 to 10	5 to 10
7	Currency	USD	USD	Japan Yen	Koera Won or USD	USD	USD
8	Repayment	Two times per year	Two times per year	Two times per year	Two times per year	One time per year	One time per year
9	Procurement Amount	50 % from china and remaining 50% could from other countries.	Any Country but Chinese products are preferable.	Japanese products are preferable.	70% from EDCF eligible country and 30% from remaining countries.	Any Country	Any Country
10	Tender Policy	Only Chinese Companies are allowed.	Only Chinese Companies are allowed.	Only Japanese Companies are allowed.	EDCF eligible country	International tender	International tender

Sources: Ministry of Electricity and Energy, 2017

3.7 Power Projects in Myanmar with Foreign Financing during 1970 to 2017

Overall energy policy falls and power sector development falls under the responsibility of MOEE. The MOEE has the primary responsibility for electricity planning, generating and transportation. It is also the supplier of natural gas for power generation and is responsible for issuing regulations on the generation, transmission and delivery of electric power in Myanmar. Its organization structure is seen in Appendix C.

For the ongoing Power projects and under construction Projects and planned power Projects, MOEE has to take and ask for the Foreign Loans, Aids, Technical Assistance from International financial institution such as World Bank, Asian Development Bank, China Bank, Germany Bank and others starting from 1970 to 2017. During these periods, Government of Myanmar take the foreign Financing for Power and Transmission line Projects. Among these projects, some Power projects are completed with foreign financing and already made the repayment the loan. Some are ongoing with foreign financing and some are negotiated and some are nominated with foreign financing. Power and Transmission line Projects which are implemented with foreign financing and already repaid back are shown in Table 3.3.

Table 3.3

Power and Transmission line Projects implemented with Foreign Financing

No.	Project Name	Country/ Organization	Signed Date of Loan Agreement Contract	Project Period		(Received and Loan Repayment Amount (MUSD)
				From	To	
1	Zawgyi (1) HPP Renovation Works	China, EXIM Bank	11.12.2017	10/2009	10/2010	4.293
2	Baluchaung (1), (2) Taungnawin HPP	Japan JICA	1985	1987 1954	1992 1974	111.110
3	Yeywa HPP	China, Exim Bank	1999	2001	2010	199.980
4	Kinda HPP	Germany	1979	1981	1985	131.351
5	Thilawa Transmission Line and Substation Project	Japan, JICA	7.6.2013	2014	2017	6932.090JPY 62.949 USD
6	Se Daw Gyi HPP	ADB	1980	1980	1989	15.748 USD

Sources: Ministry of Electricity and Energy, 2017

Summarized Power and Transmission line Projects which are ongoing, nominated and under negotiation Projects with foreign financing are shown in Table 3.4. Detail Power and Transmission line Projects which are ongoing, nominated and under negotiation Projects with foreign financing are shown in Appendix A.

Table 3.4
Summarized Projects for Ongoing, Nominated and Negotiated Power Projects by Foreign Financing

No	Supported Country/ organization	Project Quantity	Loan Amount USD (Million)	Consumed Loan Amount USD (Million)
I.	Ongoing Power Project List			
1	Republic of China	(3) Nos	191.347	77.552
2	Japan	(9) Nos	1146.093	165.376
3	Republic of Korea	(1) Nos	100.00	-
4	Asia Development Bank	(2) Nos	140.00	36.203
5	May Bank	(2) Nos	450.00	55.65
6	Germany	(1) Nos	30.00	-
	Sub Total	(18) Nos	2057.44	334.781
II.	Nominated Power Project for Foreign Financing			
1.	Japan	Nos	47	-
III.	Negotiated Power Projects for Foreign Financing			
1.	Asian Development Bank	1	400.00	
2.	World Bank	1	280.887	
3.	France	1	82.00	
4.	Thailand	1	60.00	
	Sub Total	5	822.887	
	Total		2927.327	334.781

Sources: Ministry of Electricity and Energy, 2017

CHAPTER IV

ANALYSIS OF FOREIGN FINANCING

IN SAEDAWGYI HYDROPOWER PROJECT

This Chapter especially would like to emphasis upon the Se Daw Gyi Hydropower Project which was implemented by ADB loan.

The Government of Myanmar (GOM) has been steadily increasing the budget allocated for the energy sector with the budget almost doubling over the past four years; the allocated budget however continues to remain severely underutilized. To address these kinds of issues for developing countries, the international community like World Bank, Asian Development Bank, China Exim Bank, Koera Exim Bank and others provide Loan Aid relatively large amounts of development funds under concessional terms to developing countries and regions to support their efforts for growth and development. Among these providing loan, Se Daw Gyi Hydropower Plant in Myanmar which was provided with Asian Development Bank is chosen to study the impact of foreign financing.

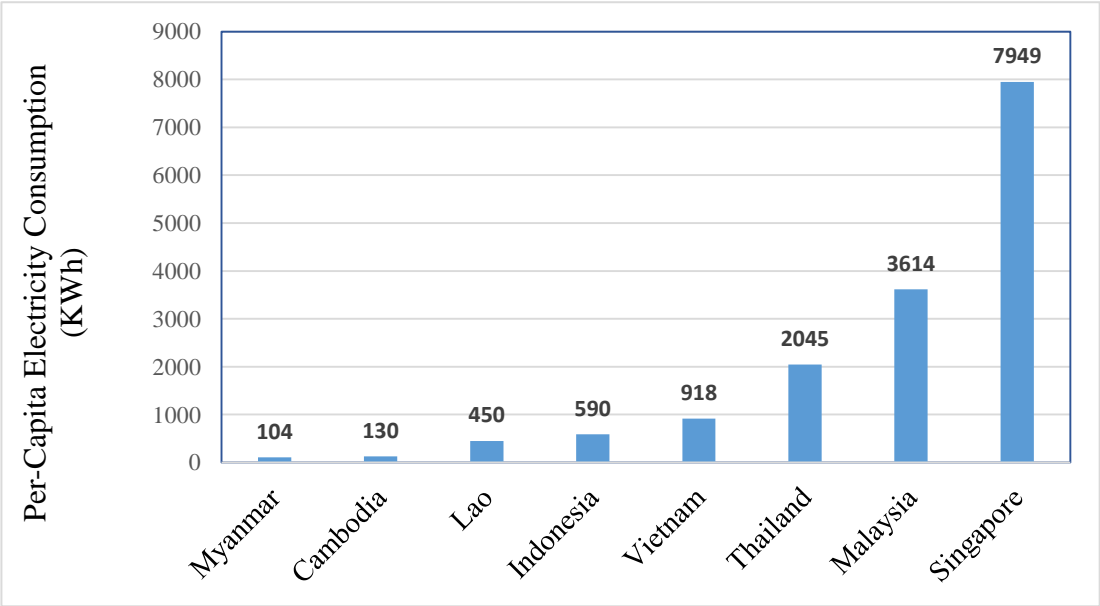
4.1 Overview of Myanmar Power

Myanmar's energy consumption is among the lowest in the world. Average annual consumption per person of around 160 kilowatt-hours (kWh) is twenty times less than the world average. About 70% of the population, and 84% of rural households, lacked grid electricity access in 2014. Off-grid schemes are rare and typically provide high cost, low reliability power service for a few hours per day. Also, access to modern fuels for cooking (such as liquefied petroleum gas) is limited to urban areas. Consequently, traditional biomass (wood and animal dung) is widely used and accounts for about two-thirds of primary energy consumption. Among 10 Asean

Countries, Singapore is the highest electricity consumption per capita about 7949 kWh and Thailand is about 2045 kWh while the least consumptions are Myanmar 104 kWh and Cambodia 130 kWh. Per Capita Electricity Consumption in Asean Countries is shown in Figure 4.1

Figure 4.1

.Per Capita Electricity Consumption in Asean Countries 2011



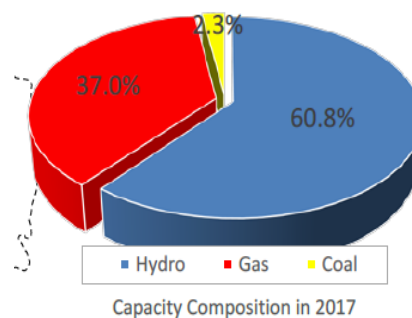
Source: World Bank 2011 (World Development Indicators online)

4.1.1 Capacity Composition of Myanmar

The installed capacity of existing power plants in Myanmar is hydropower generation (3,221 MW), gas power generation (1,958.8 MW), and coal power generation (120 MW). Total rated installed capacity is 5,299.8 MW. As 421 MW of hydropower is exported to China, total supply capacity for Myanmar is 4,878.8MW. The existing power project list are mentioned in Appendix B. The capacity composition of Myanmar in 2017 is shown in Table 4.1.

Table 4.1
Capacity Composition in 2017

Power Source	No. of Power Projects	Installed Capacity(MW)	Ratio
Hydro	27	3221.0	60.8 %
Gas	21	1958	37.0%
Coal	1	120	2.3%
Total	49	5,299.8	100%



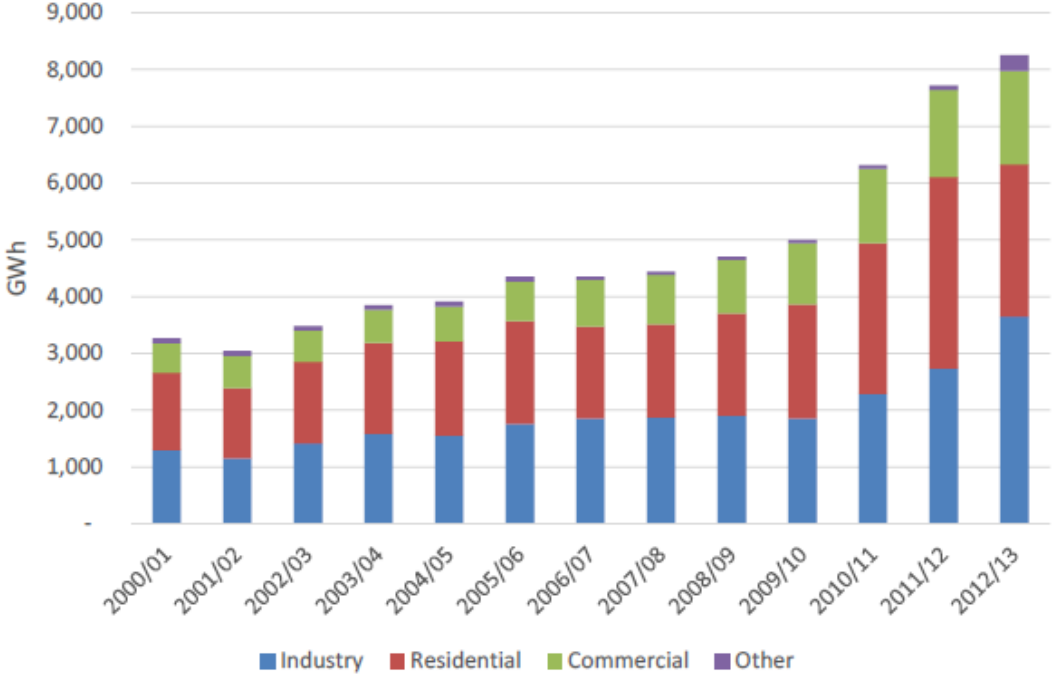
Sources: Ministry of Electricity and Energy, 2017

4.1.2 Electricity Consumption of Myanmar

Figure 4.2 show the final consumption by the end use categories in physicals and in energy equivalent terms. The main electricity end users are the industrial, residential and commercial/service sectors. Their shares in the 2012/13 total final consumption were 44%, 32% and 20% respectively.

Figure 4.2

Myanmar Electrical Consumption (GWh)



Sources: Ministry of Electricity and Energy, 2017

4.2 Loan Financing Analysis upon Se Daw Gyi Hydropower Projects

Sedawgyi HPP is implemented by Government of Myanmar, Ministry of Electricity and Energy and MoALI; in 1980. It is located in Mandalay, Chaungmagyi River of the Ayeyarwady River system, which is a HPP equipped with multi-purpose dam for irrigation and power generation was constructed by ADB's (Asian Development Bank) finance. Mandalay and the irrigation area are downstream of the Sedawgyi reservoir. The downstream flow is through the Mandalay Main Canal (MMC) and controlled by the Sedawgyi dam. Sedawgyi Multipurpose Dam has two main functions, supplying irrigation demand and the generation of hydropower. Project salient features are mentioned as follows and Map of Se Daw Gyi Hydropower Project are shown in Appendix D.

Region/ State	-	Mandalay region
River	-	Ayeyarwady River system, Chaungmagyi river
Max. power	-	25.0 MW (12.5 MW × 2 units)
Annual generated energy	-	134 GWh (nominal) / 99.9 GWh (2013 actual)
Annual operation hour	-	6,919 hour (2012 actual)
Commencement of operation	-	May 1989
Power generation type	-	Dam type
Dam/weir	-	Rock-fill dam 40.6 m high
Turbine type	-	Kaplan turbine (Toshiba),

Catchment area - 3,384 km²

4.2.1 Objective of the Se Daw Gyi HPP

Project was designed to provide additional power generation capacity to meet the projected demand of the power system of Myanmar from 1983/84. The Project was also intended to provide improved reliability of power supply to the Mandalay area, which was supplied solely by the Lawpita hydropower station through a 400 km transmission line. The Project, which is the power component of the Sedawgyi Multi-Purpose Development Scheme, is an integral part of EPC's power development plan, and was considered important for the economic and social development of the Project area and also for contributing to the development needs of the country's power system beyond 1983/84. It was also to provide a much needed power supply to the Mandalay area, which was considered essential to support the steady growth of industrialization in the area and for meeting the considerable suppressed demand of consumers for domestic, commercial, industrial and other purposes.

4.2.2 Project Financing and Implementation

The total cost of the Project was \$26,241,000 made up of \$15,748,000 in foreign currency costs and \$10,493,000 in local currency costs. ADB loan of \$15.7 million was approved by the ADB Bank on 24 April 1979. Loan signing took place on 19 June 1979. The ADB loan became effective on 2 October 1979. ADB loan of \$15.7 million was granted for a period of 25 years, including a grace period of 5 years, and with a service charge of 1 per cent per annum. The Borrower was the Union of Myanmar. The Borrower agreed to provide the Electric Power Corporation (EPC) the local currency funds needed for the Project, facilities, services, land and other resources on a timely basis and as required to ensure the successful completion of the Project. ADB loan data and calculated financial data are mentioned in Appendix F.

In the carrying out of the Project, the Borrower shall cause competent and qualified consultants and contractors acceptable to the Borrower and the Bank to be employed to an extent and upon terms and conditions satisfactory to the Borrower and the Bank.

Goods and services under the Project were procured by international competitive bidding under five groups. Electrical and Mechanical Works for the Power Station Contract is awarded to a contractor from Japan, Menka Käisha for the supply, erection, supervision and commissioning of power station equipment. Substation Equipment and Installation Contract for supply, erection and testing of auxiliary equipment for power station switchyard and Mandalay substation was awarded to a contractor from the Federal Republic of Germany. Materials for 132 kV Sedawgyi-Mandalay Transmission Line contracts for the supply of (i) lattice steel towers and accessories (ii) A.C.S.R. conductors and accessories and (iii) insulators and accessories were awarded to Hyundai Corporation from Koera, Kinsho Matachi Corporation from Japan and Mistubishi Corporation from Japan. Distribution Equipment were also awarded above mentioned three corporations. And, Office Equipment and Accounting Machines are resulted in eight relatively minor contracts for cash receipting machines, drafting machine, instruments and stationery, and other office equipment.

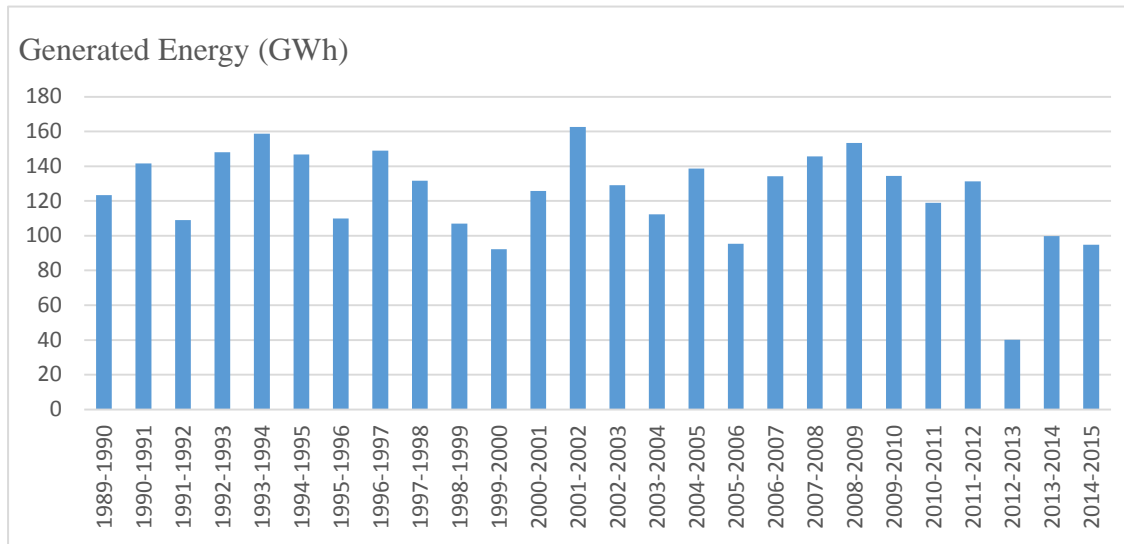
Electric Power Corporation was primarily responsible for implementation of the Project excepting the civil works of the power station, which were constructed by Irrigation Department (ID) along with the construction of the Sedawgyi dam under the Irrigation Project.

4.2.3 Condition of Generation of Se Daw Gyi during the period of 1989 to 2015

Sedawgyi HPP is base-load plant and operates for 24 hours. Annual generated energy and monthly average generated energy of this plant for 26 years from 1989 to 2015 are shown in Fig. 4.3. The annual average generated energy for latest 10 years from 2006 to 2015 is around 122 GWh/year and it seems to be decreasing from 2012 (except 2015). Maximum one is about 146 GWh/year in 2008 and minimum one is about 87 GWh/year in 2012.

Fig 4.3

Annual Average Availability Factor of Sedawgyi HPP during 1989 to 2015



Sources: Ministry of Electricity and Energy, 2017

The conditions of annual generated energy capacity are mentioned in Table 4.2. The annual average generated energy for latest 10 years from 2006 to 2015 is around 122 GWh/year and it seems to be decreasing from 2012 (except 2015). Maximum one is about 146 GWh/year in 2008 and minimum one is about 87 GWh/year in 2012.

Table 4.2**Annual Generated Energy Average Capacity during 1989 to 2015**

No.	Year	Generated Energy (GWh)		No.	Year	Generated Energy (GWh)
1	1989-1990	123.473		14	2002-2003	129.044
2	1990-1991	141.62		15	2003-2004	112.384
3	1991-1992	108.986		16	2004-2005	138.706
4	1992-1993	147.986		17	2005-2006	95.292
5	1993-1994	158.727		18	2006-2007	134.246
6	1994-1995	146.866		19	2007-2008	145.724
7	1995-1996	109.97		20	2008-2009	153.495
8	1996-1997	148.946		21	2009-2010	134.526
9	1997-1998	131.737		22	2010-2011	118.93
10	1998-1999	106.957		23	2011-2012	131.264
11	1999-2000	92.308		24	2012-2013	40.1663
12	2000-2001	125.713		25	2013-2014	99.86

13	2001-2002	162.575		26	2014-2015	94.784
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Sources: Ministry of Electricity and Energy

4.3 Financial Analysis of ADB loans upon Se Daw Gyi HPP

By using the ADB loan data and calculated financial data mentioned in Appendix F, financial analysis of Se Daw Gyi HPP was calculated.

Cash Inflow of Se Daw Gyi Hydropower Project during 1989 to 2015 and Repayment Schedule of Se Daw Gyi HPP during 1979 to 2015 are shown in Appendix G and H. As per detail calculation in Appendix I, the financial results for Return on Investment is 68%. Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or compare the efficiency of a number of different investments. ROI tries to directly measure the amount of return on particular investment, relative to the investment's cost. high ROI means that the firm is successful at using the investment to generate high returns. While really good return on investment for an investment is 15% annually, ROI of Se Daw Gyi Hydropower Investment for GOM is 68% which means the high Return on Investment for GOM. Implementing the Se Daw Gyi Hydropower Project with ADB loans make the good financial benefit to Myanmar and related Ministry of Electricity and Energy. As ADB loan should have to repay during the beginning period of Project, net cash flow for that project are deficit during the first 10 years. After that, net cash flow is positive starting from 1989-1990 to 2014-2015.

4.4 Economic Analysis of ADB loan upon Se Daw Gyi HPP

The two units now consistently generate in excess of 99.9 GWh, most of it being supplied via the 132 kV transmission line to the load centre in Mandalay which has population round about 17 Million. Apart from supplying Mandalay, the power station also supplies about 1 MW to 1.5 MW via a 33 kV line to Shwebo, a township of about 400,000 people located some 70 km north of Sedawgyi. So, the project improves the quality of the electricity supply to Mandalay, bring about electrification to areas now not served with electricity and help to promote industrial activities in the northern provinces of Myanmar. In addition, the incremental electricity supply contributes to meeting the demand of electricity in the agricultural, commercial and industrial sectors and enhancing the economic activities in these sectors. The growth of economic activities is likely to lead to more employment and higher income in the long run. Rather than, Residential consumers are able to use more electric appliances and improve the quality of life. Children can study for longer hours at night under better lighting. Some of the residential consumers may be able to start or expand income generating activities at night by utilizing electricity. People can obtain the knowledge outside their world from television, radio and the internet.

The Sedawgyi dam is located at the Chaungmagyi river in Madaya and is the main supply for the irrigation network. The main objective of the dam is to supply enough water to increase the agricultural output in Mandalay, Yenatha and the pump irrigation areas. These objectives have been planned under the project by provision of sufficient irrigation canals for growing crops. Irrigation is the application of controlled amounts of water to plants at needed intervals. Irrigation helps to grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall. The irrigation construction works are integrated with the agricultural and fisheries development program. Secondary benefits could be derived for the increase of water supply to Mandalay.

Mandalay and the irrigation area are downstream of the Sedawgyi reservoir. The downstream flow is through the Mandalay Main Canal (MMC) and controlled by the Sedawgyi dam. Sedawgyi Multipurpose Dam has two main functions, supplying irrigation demand and the generation of hydropower. Mandalay include seven townships and total population is round about 18 Million in 2017. In the agricultural areas around Mandalay there is a large variety of crops. All of these crops have different preferences for climate to have an optimal growth. As said there are three distinct seasons, summer period, winter period and rainy season In Table 4.3 the total area per crop for the whole Sedawgyi Irrigation Network and summation of the assigned areas for all specified crops and other agricultural in Mandalay are shown. As per records of Agricultural Ministry in 2014, 46,939 Ha are used for growing in different kinds of crops.

Table 4.3

Total area per crops produced in Mandalay in 2014

Crops	Total Area	Percentage of total area
Summer Paddy	29883	64%
Winter Paddy	29883	64%
Seasame	593	1%
Sunflower	0	0%
Pulses	3236	7%
Corn	2929	6%
Ground nut	446	1%
Garlic	0	0%
Wheat	4059	9%
Soybean	229	0%
Banana	3655	8%
Sugarcane	5279	11%
Vegetales	286	1%
Cattle	684	1%

Total	46939	100%
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Source: Sedawgyi Water Resources/Irrigation system simulations Report, 2014

Primary beneficiaries are the farming and landless communities (individual farmers, farmer groups, cooperatives and later water user groups) in the irrigation systems in the Central Dry Zone, plus the private sector agribusinesses which are part of the value chains especially those involved in input supply, post-harvest operations and marketing. Positive economic impacts for the farming households will flow from increased agricultural productivity and some new employment opportunities, and there are potential for other long-term economic benefits. These would include improved agricultural production on a larger scale and the potential for creating new economic activities through other allied development measures.

As Sedawgyi Hydropower Project is not only for Electricity but also for Irrigated Agriculture Inclusive Development Project, the implementation of the Sedawgyi Project generates the electricity and direct irrigation benefits to the core subproject areas due to an increase in irrigated and harvested area attributable solely to the irrigation infrastructure development.

The major anticipated impacts caused by the infrastructure subcomponents for Irrigated Agriculture Inclusive Development Project (IAIDP) like Se Daw Gyi Hydropower Project include: wastewater discharge, soil erosion; spoil and solid waste disposal; interference with traffic and municipal services, and occupational and community health and safety during construction phase. These impacts can extend to project borrow pits and material disposal sites.

Some land are acquired for temporary use during construction. Involuntary resettlement impacts are avoided. Land agreements are completed using negotiated settlement or voluntary donation. Land acquisition are undertaken according to the Resettlement and Ethnic Groups Framework. The major potential impacts of the infrastructure component for IAIDP during operation phase may include soil erosion, waterlogging and potential salinization due to insufficient drainage systems, potential water quality, soil quality and health impacts of overuse of fertilizers and pesticides, canal sedimentation, and safety issues.

CHAPTER V

CONCLUSION

This study focus on the analysis of foreign financing upon power sector in Myanmar. In addition, the suggestion and recommendations derived from the findings of the study are also discussed and identified areas for the further research and limitation of the Study.

5.1 Findings

Since 1980, Government of Myanmar accept the foreign financing and implement the infrastructure project till to date. International Partners in Development (PID) such as World Bank, ADB, China Exim Bank and JICA are providing Loan to Myanmar in the field of economic, infrastructure, human resources development, agriculture, power, energy, technical transfer by means of technical cooperation projects, grant aid projects, Official Development Assistance (ODA) loans and others with different loan Terms and Conditions to find opportunities to provide development assistance to the country.

Government of Myanmar take the foreign financing of ADB for Se Daw Gyi Hydropower Project in 1979 with the services fees 1% and high interest rate 6% per annum in comparing the interest of ADB in later of 2000 which loan interest is 1% to 1.5%. High interest rate reflects that ADB bank assume that Se Daw Gyi HPP is a higher level of risk, ADB typically charge the project company a higher interest rate on project finance loans when compared to corporate finance loans. ADB provide the financing amount for around 50% of the project cost with the reasonable grace period 5 years and repayment period 25 years.

While the related Ministry invite the Tender by using the foreign financing, the financing providing countries set the tender policy which allow only the domestic industries and companies from foreign financing providing countries. ADB is free from that kinds of policy and Goods and services under the Project were procured by international competitive bidding such as the countries of Korea and Japan. It means that GOM could choose the competitive price and qualities of products and materials for Sedawgyi Hydropower Projects.

As per financial analysis, Return on Investment ROI take 68% means that implementing the project with higher level of loan financing make the good financial return for Government of Myanmar.

After the Se Daw Gyi Hydropower project is implemented, transmission line to the load centre in Mandalay which has population round about 17 Million. Apart from supplying Mandalay, the power station also supplies about 1 MW to 1.5 MW via a 33 kV line to Shwebo, a township of about 400,000 people located some 70 km north of Sedawgyi. The implementation of the Project and the development of Se Daw Gyi is expected to generate direct irrigation benefits to the core subproject areas due to an increase in irrigated and harvested area attributable solely to the irrigation infrastructure development.

Se Daw Gyi can have positive impacts on food security, household income, health conditions, and rural employment. It should have multiplier effects on local economic development and water governance. Positive economic impacts for the farming households will flow from increased agricultural productivity and some new employment opportunities, and there are potential for other long-term economic benefits. These would include improved agricultural production on a larger scale and the potential for creating new economic activities through other allied development measures.

But, at the other side, Se Daw Gyi also have negative impacts include soil erosion, waterlogging and potential salinization due to insufficient drainage systems, potential water quality, soil quality and health impacts of overuse of fertilizers and pesticides, canal sedimentation, and safety issues. The agriculture support features which will minimize these potential operational impacts.

5.2 Suggestions

As per the IMF analysis in 2015, Myanmar is assessed to remain at low risk of external debt distress. Although, total public debt of Myanmar is also projected to remain below benchmark in the baseline, the heavy dependence on the GOM's subsidy is the increasing trend of the liability to the GOM. Myanmar could benefit from external financing if it enables them to undertake investments that could not have been financed out of domestic resources alone and whose social return is in excess of the cost of funds obtained.

In order to implement the Hydropower Project by foreign financing, instead of China loans which interest rate is higher than other Institution such as ADB, World Bank and JICA loan interest, MOEE should consider the low interest rate loan. And also, MOEE should not consider the foreign financing like China Exim Bank which tie the borrowing countries by using the policy to procure the materials and products from China with foreign financing.

While the proposed project can have positive impacts on food security, household income, health conditions, and rural employment, it is also requiring to consider soil erosion, waterlogging and health impacts of overuse of fertilizers and pesticides, canal sedimentation, and safety issues during construction and after construction of the Project.

5.3 Need for Further Study

In this study, financial analysis and economic analysis upon only one Hydropower project is not covered to realize the overall financing upon Power sector in Myanmar. As studied project is government project in 1980, mostly data was difficultly collected from related Ministries, the data used in this study is very general. To enhance the robustness of the results, more power projects such as solar,

Gas, LNG, coal and diesel projects which are provided by foreign financing are required to study. Together these limitations lead to directions for further research.

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APPENDIX

APPENDIX A

Detail Power and Transmission line Projects which are ongoing, nominated and under negotiation Projects with foreign financing

Ongoing Projects of Signed Loan contract						
No.	Name of Project	Country/ Organization	Currency	Loan Amount (M)	Received Amount (MUSD)	Loan Contract Date
1	Upper KyaingTaung Hydropower project	China /Exim PBC	USD	9.504	9.504	30/07/2010
2	Upper Yaywa Hydro Power Project	China/EXIM Bank	USD	101.98	21.826	14/11/2014
3	Thahtay Hydropower Project	China/EXIM Bank	USD	49.357	49.357	14/09/2012
4	Poverty Reduction Project for Electricity Distribution Plan under 17 billion in 5 States and 6 Divisions	Japan	JPY	4766.36	JPY4054.006	07/06/2013
5	Urgent Rehabilitation for Yangon Distribution and Substation	Japan	JPY	14052.00	0.00	07/06/2013
5	Rehabilitation of power plants and substations in Yangon Urgent Rehabilitation and Upgrade Project (MYP-2)	Japan	JPY	14052	JPY 489.317	07/06/2013
6	Transmission Line and Substation Project for Thilawa Industrial Zone Infrastructure Development Project in Thilawa Area Phase I (MY-P3)	Japan JICA	JPY	10569.00	JPY 10606.87	07/06/2013
7	National Power Transmission Network Development Project - Phase I (MYP-8) (Meikhtila 500 kV Substation and Taungoo 500 kV Substation Project)	Japan	JPY	24678.00	JPY 350.806	26/03/2015

Ongoing Projects of Signed Loan contract						
No.	Name of Project	Country/ Organization	Currency	Loan Amount (M)	Received Amount (MUSD)	Loan Contract Date
8	National PowerTransmission Network Development Project - Phase I I(MYP-14) (500 kV Phayargyi - Hlaingthayar Transmission Line and 500 kV Hlaingthayar Substation, 500 kV Phayargyi Substation Project)	Japan	JPY	41115	0.00	16/11/2015
9	Power Distribution Improvement Project in Yangon Phase I(MY-P10)	Japan	JPY	6105.00	-	30/06/2015
10	Regional Development Project for Poverty Reduction Phase II (MYP-17)	Japan	Yen	6650.00	-	01/03/2017
11	Power Distribution System Improvement Project in Major Cities	Japan/JICA	JPY	4856.00	-	01/03/2017
12	Hydropower Plant Rehabilitation Projects (Sedawgyi Hydropower Plant Rehabilitation Project and Baluchaung No.1 Hydropower Plant Revovatioj Project(MY-P22)	Japan	JPY	10787.00	-	25/04/2017
13	500 KV Taungoo (Sabarkywe) - Bago (Phayargyi) 500 kV Transmission Line and Substation Project (Taungoo - Bago - Phayargyi)	Korea	USD	100.00	0.00	07/11/2017
14	Improvement Power Distribution System Project in Yangon, Mandalay, Sagaing and Magway Division	ADB	USD	60.00	38.167	28-1-2018
15	230 kV Transmission Line and Substation Project in Yangon Division (Power Transmission Improvement Project)	ADB	USD	80.00	0.00	26/04/2016
16	Natural Gas and Thermal Power Plant Project Myanmar Electric Power Project	World Bank	USD	140.00	66.929	12/10/2013
17	National Electrification Plan Grid Extension Project (NEP)	World Bank	USD	310.00	2.62400	3-11-2015

Ongoing Projects of Signed Loan contract						
No.	Name of Project	Country/ Organization	Currency	Loan Amount (M)	Received Amount (MUSD)	Loan Contract Date
18	Rural Electrification Programme II (Grid Extension)	Germany/KfW	Euro	23.88	-	-
Nominated Projects for Loan						
No.	Name of Project	Country/ Organization	Currency	Loan Amount (M)		
1	Upgraded Thilawa Power Plant and Relocation of NEDO machine from Ywama Power Plant		USD	47.00		
Discussed Projects for Additional Foreign Loan						
No.	Name of Project	Country/ Organization	Currency	Loan Amount (M)		
1	IDA National Electrification Project with ADB Bank	ADB	USD	400.00		
2	Ywama 250 MW Natural Gas and Thermal Power Plant and 230 kV Transmission Line Project	WB	USD	280.89		
3	Rehabilitation of (5) Hydropower Plants	France/AFD	USD	37.30		
4	Shweli (3) Hydropower Project	France/AFD	USD	50.00		
5	Power System Development in Yangon City Project (North Okkalapa and North Dagon Townships) with NEDA (Thailand)	Thailand/NDEA	USD	60		
1	Distribution Network Improvement	Japan	USD	150		
2	Power Distribution Improvement Project in Yangon Phase 2	Japan	USD	27.187		
3	Power Distribution System Improvement Project in Major Cities Phase 2	Japan	USD	144.557		
4	Hydro Power Rehabilitation Project (Yeywa)	Japan	USD	13		

Ongoing Projects of Signed Loan contract						
No.	Name of Project	Country/ Organization	Currency	Loan Amount (M)	Received Amount (MUSD)	Loan Contract Date
5	Power Generation Project	Japan		USD	380	
6	National Power Transmission Network Development Project Phase 3	Japan		USD	312	
7	New Hydropower Project	Japan		USD	6.463	
8	Infrastructure Development Project in Thilawa Phase II	Japan		USD	124	

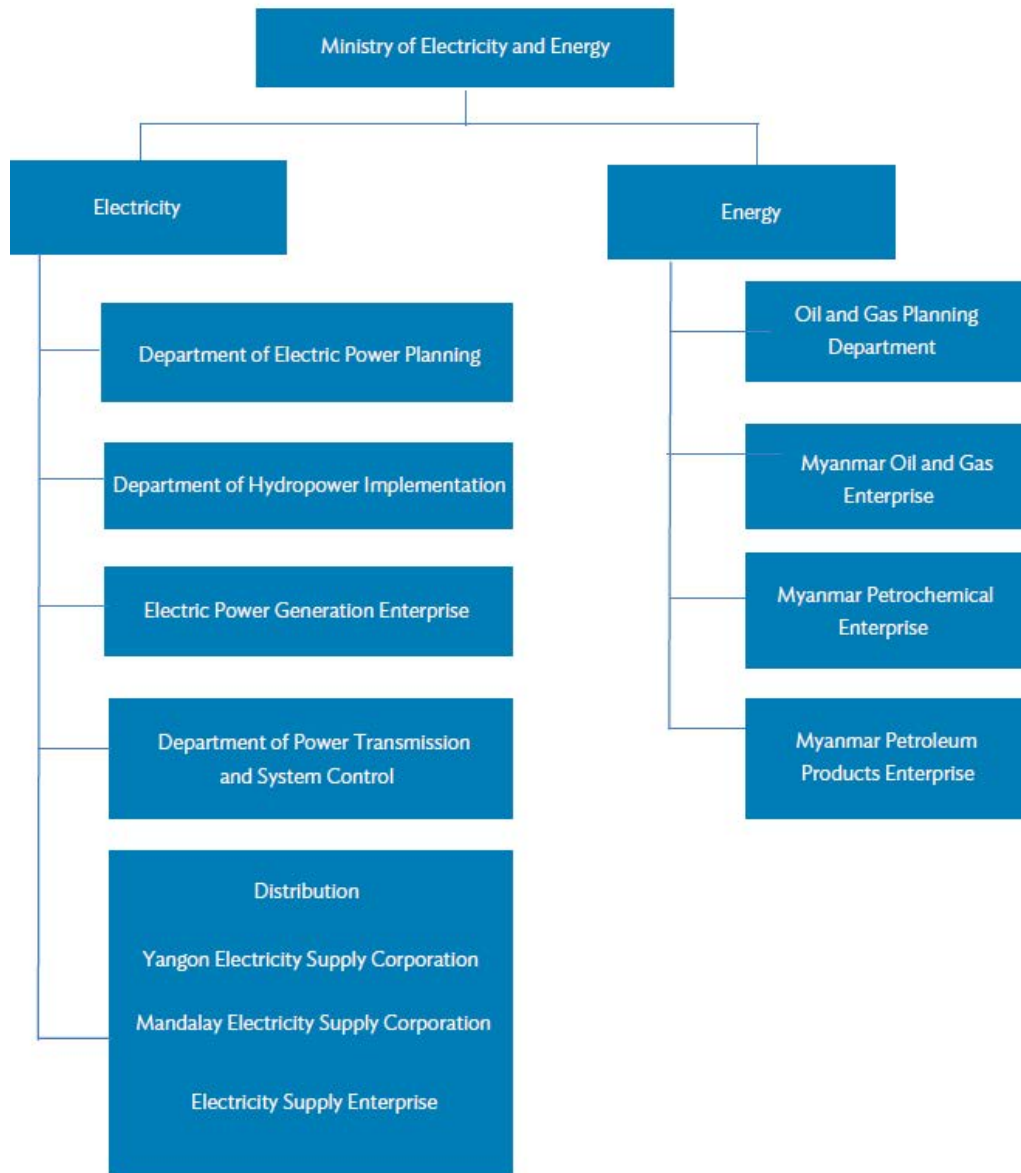
APPENDIX B

List of Existing Hydropower Plants in Myanmar in 2017

No	Projects	Location	Project Scheme	MW	Completion Date
1	Balue Chaung (2)	Kayah State	MOEE	168	1960/1974
2	Kingdar	Mandalay Region	MOEE	56	1986
3	Sedaw gyi	Mandalay Region	MOEE	25	1989
4	Balue Chaung (1)	Kayah State	MOEE	28	1992
5	Zawgyi (1)	South Sham State	MOEE	18	995
6	Zawgyi (2)	South Sham, State	MOEE	12	1998
7	Zaung tu	Pago region	MOEE	20	2000
8	Thaphenseik	Sagaing Region	MOEE	30	2002
9	Mone Chaung	Magwe Region	MOEE	75	2004
10	PaungLaung	Mandalay Region	MOEE	280	2005
11	YeNwe	Bago Region	MOEE	25	2007
12	Khapaung	Bago Region	MOEE	30	2008
13	ShweLi (1)	Shan State	JV BOT	600	2009
14	Kyaing Taung	South Sham State	MOEE	54	2009
15	YeYwa	Mandalay Region	MOEE	790	2010
16	Shwe Kyin	Bago Region	MOEE	75	2011
17	Terpain (1)	Kachin State	JV BOT	240	2011
18	Kyeeon Kyeewa	Magwe Region	JV BOT	74	2011
19	Kun Chaung	Bago Region	MOEE	60	2012
20	Chiphwe Nge	Kachin State	JV BOT	99	2013
21	Baluchaung (3)	Kayah State	BOT	52	2013
22	Thauk Ye Khat(2)	Bago Region	BOT	120	2014
23	Nan cho	Mandaly Region	MOEE	40	2014
24	PhuyChaung	Bago Region	MOEE	40	2014
25	Upper Paunglaung	Mandalay Region	MOEE	140	2015
26	Myo Gyi	Shan State	MOEE	30	2016
27	Myitta	Sagain State	MOEE	40	
	Total			3221	

APPENDIX C

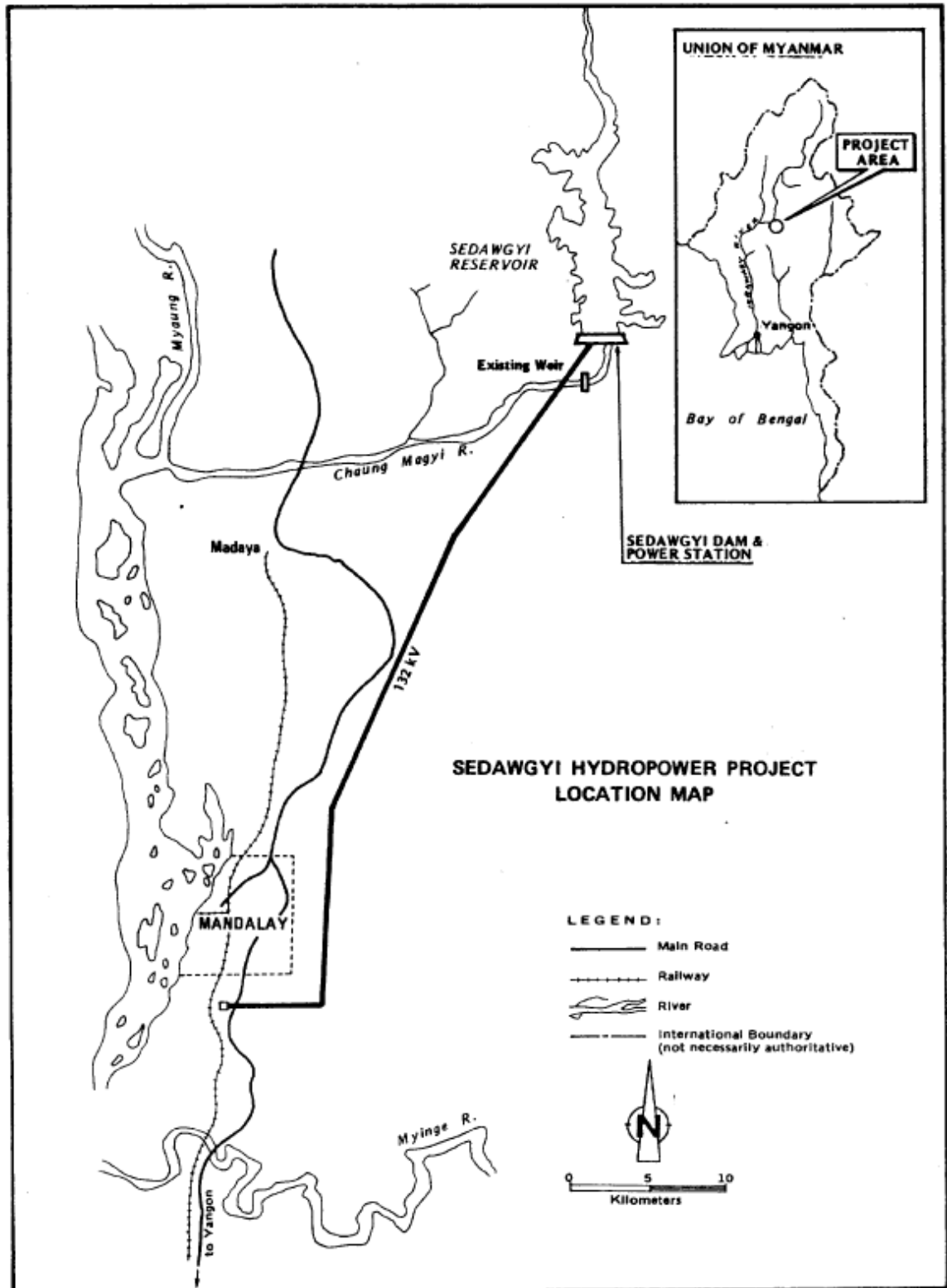
Organization of the Ministry of Electricity and Energy



Source: Ministry of Electricity and Energy, 2016

APPENDIX D

Map of Sae Daw Gyi HPP



APPENDIX E

Detail Project Cost for Sae Daw Gyi

1.	Project Cost (\$ million)	Total (USD)
	Foreign Exchange	15.748
	Local Currency	13.382
	Total	29.130
2.	Cost Breakdown by Project Components (\$ million)	
	a. Power Station	
	(i) Civil works	2.981
	(ii) Generating Plant & equipment including power station auxiliaries, crane, etc, and installation	13.411
	(iii) Consulting Services	0.548
	(iv) Contingencies (10%)	2.852
	Sub Total for Item A	19.792
	b. Substation	
	(i) Equipment including transformers & switchgear & installation	3.469
	(ii) Contingencies	-
	(iii) Custom duties and taxes	1.052
	(iv) Price Escalation	-
	Sub Total for Item B	4.521
	c. Transmission line	
	(i) Materials & Erection	1.273
	(ii) Contingencies	-
	(iii) Custom duties and taxes	0.591
	(iv) Price Escalation	-
	Sub Total for Item C	1.864
	d. Distribution Equipment	
	(i) Equip & Erection	2.046
	(ii) Contingencies (10%)	-
	(iii) Custom duties and taxes	0.907
	(iv) Price Escalation	-
	Sub Total for item D	2.953
	Total for Items A, B, C and D	29.130

APPENDIX F

ADB Loan Data and Calculated Financial Data

ADB Loan Datas

1. Loan Amount	:	15.748 MUSD
2. Date of Loan Agreement	:	19 June 1979
3. Date of Loan Closing	:	11 July 1989
4. Terms of Loan	:	
- Interest rate	:	1 % upon loan amount (Service charges)
- Repayment period for service charges	:	10 years
- Interest rate	:	6% upon loan amount
- Loan Repayment Period	:	25 years
- Grace Period	:	5 years

Calculated financial Data

Government Finance	:	13.382 MUSD
ADB Finance	:	15.748 MUSD
Total Project cost	:	29.130 MUSD (including duty tax)
Total Generation Capacity	:	3351 GWh (1989 to 2015)
Project Life	:	35 years
Average tariff rate	:	20 kyats
Exchange rate	:	starting from 100ks/USD in 1989 to 1000 ks/USD in 2015
Transmission and system losses	:	10%
Staff and Consultant fees	:	1% of Project cost
Operation & Maintenance	:	1% of Project cost
Government Bank Interest	:	3% per annum
Office expense and Travelling	:	0.5% of Project cost

APPENDIX G

Cash Inflow of Se Daw Gyi Hydropower Project during 1989 to 2015

No.	Year	Generated Energy (GWh)	Generated Energy (KWh)	Tariff rate (Kyats)	Total Amount (Kyats)	Total Amount (USD)	Exchange Rate
1	1979-1980						
2	1980-1981						
3	1981-1982						
4	1982-1983						
5	1983-1984						
6	1984-1985						
7	1985-1986						
8	1986-1987						
9	1987-1988						
10	1988-1989						
11	1989-1990	123.473	123,473,000	18	2,222,514,000	22,225,140	100
12	1990-1991	141.62	141,620,000	18	2,549,160,000	25,491,600	100
13	1991-1992	108.986	108,986,000	18	1,961,748,000	9,808,740	200
14	1992-1993	147.986	147,986,000	18	2,663,748,000	13,318,740	200
15	1993-1994	158.727	158,727,000	18	2,857,086,000	14,285,430	200
16	1994-1995	146.866	146,866,000	18	2,643,588,000	13,217,940	200
17	1995-1996	109.97	109,970,000	18	1,979,460,000	6,598,200	300
18	1996-1997	148.946	148,946,000	18	2,681,028,000	8,936,760	300
19	1997-1998	131.737	131,737,000	18	2,371,266,000	7,904,220	300
20	1998-1999	106.957	106,957,000	18	1,925,226,000	3,850,452	500
21	1999-2000	92.308	92,308,000	18	1,661,544,000	2,769,240	600
22	2000-2001	125.713	125,713,000	18	2,262,834,000	3,771,390	600
23	2001-2002	162.575	162,575,000	18	2,926,350,000	4,877,250	600
24	2002-2003	129.044	129,044,000	18	2,322,792,000	3,871,320	600
25	2003-2004	112.384	112,384,000	18	2,022,912,000	3,371,520	600
26	2004-2005	138.706	138,706,000	18	2,496,708,000	3,120,885	800
27	2005-2006	95.292		18			800

			95,292,000		1,715,256,000	2,144,070	
28	2006-2007	134.246	134,246,000	18	2,416,428,000	3,020,535	800
29	2007-2008	145.724	145,724,000	18	2,623,032,000	3,278,790	800
30	2008-2009	153.495	153,495,000	18	2,762,910,000	3,453,638	800
31	2009-2010	134.526	134,526,000	18	2,421,468,000	2,421,468	1,000
32	2010-2011	118.93	118,930,000	18	2,140,740,000	2,140,740	1,000
33	2011-2012	131.264	131,264,000	18	2,362,752,000	2,362,752	1,000
34	2012-2013	40.1663	40,166,300	18	722,993,400	722,993	1,000
35	2013-2014	99.86	99,860,000	18	1,797,480,000	1,797,480	1,000
36	2014-2015	94.784	94,784,000	18	1,706,112,000	1,706,112	1,000
					58,217,135,400	170,467,405	

APPENDIX H

Repayment Schedule of Se Daw Gyi during 1979 to 2015

ADB Loan %			100%	15,748,381	
Service Charges %			1%	157,483.81	
Interest %			6%	9,449,029	
Grace Period			5	Year	
Maturity Period			25	Year	
Period (For Service)			10	Year	

Year	Principal	Repayment	Remaining Payment	Service Charges	Interest	Total Amount (USD)
1979-1980	15,748,381					
1980-1981						
1981-1982						
1982-1983						
1983-1984					-	
1984-1985		629,935	15,118,446	151,184	907,107	1,688,226
1985-1986		629,935	14,488,511	144,885	869,311	1,644,131
1986-1987		629,935	13,858,575	138,586	831,515	1,600,036
1987-1988		629,935	13,228,640	132,286	793,718	1,555,940
1988-1989		629,935	12,598,705	125,987	755,922	1,511,845
1989-1990		629,935	11,968,770	119,688	718,126	1,467,749
1990-1991		629,935	11,338,834	113,388	680,330	1,423,654
1991-1992		629,935	10,708,899	107,089	642,534	1,379,558
1992-1993		629,935	10,078,964	100,790	604,738	1,335,463
1993-1994		629,935	9,449,029	94,490	566,942	1,291,367
1994-1995		629,935	8,819,093		529,146	1,159,081
1995-1996		629,935	8,189,158		491,349	1,121,285
1996-1997		629,935	7,559,223		453,553	1,083,489
1997-1998		629,935	6,929,288		415,757	1,045,692
1998-1999		629,935	6,299,352		377,961	1,007,896
1999-2000		629,935	5,669,417		340,165	970,100
2000-2001		629,935	5,039,482		302,369	932,304

2001-2002		629,935	4,409,547		264,573	894,508
2002-2003		629,935	3,779,611		226,777	856,712
2003-2004		629,935	3,149,676		188,981	818,916
2004-2005		629,935	2,519,741		151,184	781,120
2005-2006		629,935	1,889,806		113,388	743,324
2006-2007		629,935	1,259,870		75,592	705,527
2007-2008		629,935	629,935		37,796	667,731
2008-2009		629,935	(0)		(0)	629,935
2009-2010						-
2010-2011						-
2011-2012						-
2012-2013						-
2013-2014						-
2014-2015						-
2014-2015						-
Total	15,748,381	15,748,381	-	1,228,374	11,338,834	28,315,589

Annexure I

Detail Project Calculation for Se Daw Gyi Hydropower Project

Currency

	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
		1979-1980	80-81	81-82	82-83	83-84	84-85	85-86
<u>Cash Inflow</u>								
<u>AR Collection Plan</u>								
Revenue	170,467,405							
Loan From Bank	29,130,000	2,431,300	4,862,600	2,431,300	1,823,475	1,823,475	1,823,475	1,823,475
ADB Loan (15,748,381)								
Gov Finance (13,382,000)								
Total Cash inflow	199,597,405	2,431,300	4,862,600	2,431,300	1,823,475	1,823,475	1,823,475	1,823,475
<u>Cash Outflow</u>								
<u>Supplier Payments</u>								
ADB Loan	15,748,381							
Gov Finance	13,382,000							
Project Cost (Including Tax)								
Power Station	19,792,000	1,979,200	3,958,400	1,979,200	1,484,400	1,484,400	1,484,400	1,484,400
Substation	4,521,000	452,100	904,200	452,100	339,075	339,075	339,075	339,075
Transmission Line	1,864,000							
Distribution Equipment	2,953,000							
Direct Cost								
Repayment to Bank	15,748,381						629,935	629,935
1% Service Chgs to Bank	1,228,374						151,184	144,885
6% Interest to Bank	11,338,834						-	907,107
HR & Consultant	10,486,800	291,300	291,300	291,300	291,300	291,300	291,300	291,300
Office Expenses	5,243,400	145,650	145,650	145,650	145,650	145,650	145,650	145,650
Transportation & Travelling	5,243,400	145,650	145,650	145,650	145,650	145,650	145,650	145,650
Operation & Maintenance	10,486,800	291,300	291,300	291,300	291,300	291,300	291,300	291,300
Losses 10% (Transmission + System)	17,046,740							
5% Commercial Tax	8,523,370	-	-	-	-	-	-	-
2.5% Withholding Tax	4,261,685	-	-	-	-	-	-	-
Total Cash outflow	118,737,785	3,305,200	5,736,500	3,305,200	2,697,375	2,697,375	3,478,495	4,379,302
Net Cash Flow	80,859,620	(873,900)	(873,900)	(873,900)	(873,900)	(873,900)	(1,655,020)	(2,555,827)
Accumulated Net Cash Flow		(873,900)	(1,747,800)	(2,621,700)	(3,495,600)	(4,369,500)	(6,024,520)	(8,580,347)
Working Capital Requirement		15,983,255						
Bank Interest 3 % interest	170,938	2,184.75	4,369.50	6,554.25	8,739.00	10,923.75	15,061.30	21,450.87
Net Cash Flow after deduct bank interest	80,688,682							
ROI %		68%						