A STUDY ON FINANCIAL EVALUATION OF HYDROPOWER PROJECT

(With Reference to Lower Modi 1 Hydropower Project 10MW)

A Thesis

Submitted By

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2nd Year Exam Symbol No.: 5194

Submitted to:

Office of the Dean

Faculty of Management

Tribhuvan University

In partial fulfillment of the requirement for the degree of

Master of Business Studies (MBS)

Kathmandu, Nepal

March 2013

RECOMMENDATION

This is to certify that the thesis

Submitted by:

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Entitled:

A STUDY ON FINANCIAL EVALUATION OF HYDROPOWER PROJECT

(With Reference to Lower Modi 1 Hydropower Project 10MW)

has been prepared as approved by this Department in the prescribed format of the Faculty of Management. This thesis is forwarded for examination.

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DECLARATION

I hereby declare that the work reported in this thesis entitled "**A Study on Financial Evaluation of Hydropower Project (With Reference to Lower Modi 1 Hydropower Project 10MW)**" submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the degree of Master of Business Studies (MBS) under the supervision of Dr. Sushil Bhakta Mathema and Ram Prasad Acharya of Nepal Commerce Campus, T.U.

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ACKNOWLEDGEMENT

First of all, I would like to thank Tribhuvan University for giving chance to prepare the thesis for a partial requirement to the fulfillment of M.B.S. program held under Tribhuvan University.

I express my profound gratitude to my supervisor **Dr. Sushil Bhakta Mathema** and **Mr. Ram Prasad Acharya,** for their patient and continuous guidance with valuable comments and kind support to me all way through this thesis.

I also owe an indebtedness to all reputed authors whose writings have provided me the necessary guidance and invaluable materials for the enrichment of my research paper in all possible ways. I would like to express my genuine appreciation to all the staff of Nepal Commerce Campus and Staffs of United Modi Hydropower Private Limited.

At last but not least, my paramount dedication is to my family members who have been uninterrupted source of sustain for me while in during the tribulation of this research work.

…….

Saroj Kumar Jha

ABBREVIATIONS

ADB	-	Agriculture Development Bank
BOQ	-	Bills of Quantity
GW	-	Giga Watt
INGOs	-	International Government Organizations
LFI	-	Local Financial Institutions
LM1HPP	-	Lower Modi 1 Hydropower Project
MOE	-	Ministry of Energy
MOF	-	Ministry of Finance
MOWR	-	Ministry of Water Resources
NEA	-	Nepal Electricity Authority
NGOs	-	Non Government Organizations
NHA	-	Nepal Hydropower Association
NRB	-	Nepal Rastra Bank
OPEC	-	Organization of Petroleum Exporting Countries
PPA	-	Power Purchase Agreement
SHDB	-	Small Hydel Department Board
UMHP	-	United Modi Hydropower P. Ltd
UNCDF	-	United Nations Capital Development Fund

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CHAPTER – I

INTRODUCTION

1.1. Background of the Study

Nepal is a landlocked mountainous country where more than 2.64 Crore people live. Almost people live in rural areas most of which accessible only by foot. It is located in the middle of the Himalayan belt on the Asian Subcontinent and has a total land area of 147,181 km^2. Nepal is rectangular in shape and extends about 885 km from east to west and varies in North-South width from 150 to 250 km. The country borders China in the north and India in the South, East and West.

Nepal has three distinct geographical belts running from east to west: the Himalayas in the North perpetually covered by snow with several high peaks; the lower Himalayas or the high hills, characterized by long terraced slopes with thin soil cover, valleys and lakes; and the flat Terai plain in the South with alluvial soil and dense forests.

The diverse topography and the pronounced influence of dry and wet monsoons divides the climatic conditions of Nepal into five types: Sub-Tropical, Warm Temperate, Cool Temperate, Alpine and Arctic, The distribution of rainfall is

complex and varies from region to region, but the average annual rainfall of the country is about 1,814 mm.

Agriculture is the main source for the livelihood of most people; the industrial base is negligible. It is heavily dependent on imported raw materials as well as on imported manufactured goods for development and consumers needs. Biomass is the predominant source of energy for the rural population. Domestic fossil fuels are non-existent; all must be imported. An adequate supply of electricity is lacking and the deficit of power and energy, the key to industrialisations is growing. In fact, the Nepal Power System supplies less than 20 percent of population at present.

Nepal is rich in natural endowments: hydro potential, natural beauty, diverse flora, fauna and many different tribes & ethnic group. Hydropower generation is one of the four main economic growth sectors. Linking biodiversity and hydro-energy provide great promise for the economic prosperity of the country.

Hydro Power is a vital input needed to fuel the engine of economic growth and to fulfil the basic needs of the entire population of a country. Energy differentiates a least developed or developing economy from a developed economy. Empirical evidence suggests that lack of energy can whittle down the pace of economic development while its abundance can stimulate the development.

Hydropower is the most critical input for agriculture as well as, industries, IT & telecommunications and raising the quality of life of people. The Government's own statements amply confirm that it is well aware that the "marginal productivity" of power in the rest of the economy is far greater than the cost of power. This means that power development ought to be the top most economic priority of the State. Only a dogmatic monetarist position would insist on identifying the finances for power development with required savings for the economy as a whole. Deficit financing in the case of power (if tight

implementation schedules can be adhered to) need to be inflationary given the extremely high marginal product of power in industry and agriculture. With the extra power availability, if output can go up significantly, then the resources would be self-financed for the economy as a whole, via increased income generation.

Huge amount of investment that runs into millions of rupees is required in the power sector. Besides capital expenditure in the form of plant and equipment, a major chunk of the money is spent on fuel that is the most important raw material (in case of Thermal). Repairs and maintenance and administrative and other overheads also occupy a substantial share in the total expenditure.

The initiative taken by Government of Nepal to involve the private sector in hydropower development has yet to deliver expected results. With the public sector being unable to mobilize the funds required to set up hydropower projects, it is necessary to address the issues hindering the flow of private fund in hydropower sector.

1.2. Historical Background Hydropower Generation

The history of hydropower development began with the use of water wheels for agro-processing in rural areas. The wooden vertical axis water wheel, locally called, as "ghatta" was the historical innovation of the early age.

Nepal has no long history in the field of Hydropower Generation and development. After the democratic Movement in 2007, democratic governments had started to develop Power Station. Before 2007 BS, there are few (only 2-3) power stations in Nepal. Nepal’s topography has given a unique opportunity for the development of hydropower potential in Nepal, which has been estimated to be almost 83000 MW. Only a very small potential, less than 1% harnessed so far to meet the internal power demand of the country.

Looking behind the historical background of Hydropower Generation, in 1911 A.D Chandra Samser Janga Bahadur Rana started the first hydropower from Pharping Small Hydroelectric Center having capacity 500 KW for Kathmandu Valley. This is one of the earliest Hydel plant in Asia built with technical and financial assistance of England. Then, in 1934, Sundarijal Hydropower was commissioned that having capacity 900 KW. In Such way, other Hydropower Stations were gradually established.

In 1975 AD, Electricity Department of Government of Nepal created a Small Hydel Department Board (SHDB) to implement government policy on small hydropower development. It was made responsible for planning, designing and construction works in Nepal. The Electricity Department and Nepal Electricity Corporation Later merged to form Nepal Electricity Authority in 1985.

From the mid 1970 onwards the Agriculture Development Bank (ADB/N), a government development bank, specializing in the field of agriculture and rural credit, took an active leadership in the field of the small hydropower development. In 1964 a 667 KW Hydel Power Station was established by Morang Hydel Company, Biratnagar and distributed the power that is first company in generation and distribution of electricity in Nepal. In the mean time, some thermal power plant was installed for power generation, which was Biratnagar Thermal Plant-800 KW, Mahendra Diesel Plant-1728 KW.

Nepal is very rich in hydropower potential. It is said that Nepal is second after Brazil in hydro potential in terms of size of country. A survey has shown that Nepal has hydro potential of order 83,000MW and out of which 44,000MW is economically feasible for development. Out of total potential only 606MW (approx.) is developed so far. Being one of the most abundant natural resources of country, “Development of Hydropower” is the most talked topics in Nepal.

Brief Description of Lower Modi 1 Hydropower Project (10 MW)

This study focuses on the financial assessment of a Hydropower Project. Brief introduction of the hydropower project under consideration is given as below:

United Modi Hydropower P. Ltd (UMHP) was established on 5th Mangsir 2064 and registered in Company Registrar Office. The Company is promoted by the renowned Builders and Hydropower entrepreneurs. Presently the Company has been involved in constructing Lower Modi 1 Hydropower Project (10MW) (LM1HPP) situated at Chuwa VDC, Parbat District, Nepal. The Company has obtained license to produce energy from Government of Nepal, Ministry of Energy on 2066/05/02 for the period from 2066/05/02 to 2101/05/02 *(Power Generation License obtained by LM1HPP from Ministry of Energy)*. The project has been targeted to be completed within 22 months. Company has entered into Power Purchase Agreement with Nepal Electricity Authority on 2065/10/20. Company has entered into agreement with consortium of Banks and Financial Institutions lead by Citizens Bank International Ltd on 3rd August 2009.

The total cost of the project is 164 Crore. The financial indicator of the project is highlighted as below:

Table 1.1

Financial Indicators

S.N.	Particulars	Indicator
1	Simple payback period	6.78 Years
2	Discounted Payback Period @ 10%	13.90 Years
3	Debt Service Coverage	2 times
4	Internal Rate of Return	12.75%
5	Return on equity	17.66%

Source: Audited Annual Report 2067/68

Summary of BOQ is as follows:

Table 1.2

Bills of Quantity (BOQ)

Particulars	**Amount in Rs.**
Total Civil Works	984,651,219.21
Hydro Mechanical Works	19,458,600.00
Electro Mechanical Works	288,165,937.50
Transmission Lines and Sub Stations	83,307,131.25
Land and Land Development	59,107,000.00
Pre-operating Expenses	35,708,000.00
Interest During Construction	170,665,000.00
Total Cost	**1,641,062,887.96**

Source: Audited Annual Report 2067/68

The study focuses on the financial project of the project and its practical application.

1.3. Evolution of Hydropower Financing in Nepal

In the past, government only was involved in developing the hydro projects, but after 1990 the involvement of private sector in hydropower development has changed the scenario of the hydropower development. The present government policies are also favorable for the private sector to develop electricity and sell to government or public. Therefore, the potential of booming the private sector investment in hydropower development can be seen.. The private companies are in various stage of the project development, mostly are under study but a few are under execution. One of the major problems of the private companies is to arrange the funding for their projects. So far now private companies are looking for the foreign partners to finance the project. If the foreign partner get in to the project, then the total concept get changed, which then is managed by them, which does not impart much in local development concept.

In the early stage, all the public sector hydropower projects including micro and mini are funded by the government either from its own resources or from the funds provided by the donors. The capital outlay made can be considered as a non-recoverable grant for the project implementation. The main constraint on the public sector hydropower Programme is a lack of continuous funding for the project implementation. The public sector hydropower construction Programme has received substantial assistance both from the multinational and bilateral donor agencies. The assistance has been in the form of grant aid or soft loan. The World Bank Asian Development Bank (ADB), United Nations Capital Development Fund (UNCDF), Organization of Petroleum Exporting Countries (OPEC) , Swiss Corporation, NORAD have assisted about half of the total public sector Power Project through financial assistance.

More than 80% of the private small hydropower projects are funded by the ADB/N. Rest of the projects is funded through other commercial banks and donor agencies. His Majesty's Government, for the first time, announced a policy of subsidy in 1985 for construction of small hydro project on the cost of equipment for electricity generation, transmission and distribution for the private rural electrification projects through ADB/N.

Nepal has followed a planned economic development model form 1956 in the form of a 5-year development plan.

A major policy instrument adopted in the Hydropower sector is Hydropower Development Policy 1992; to facilitate rapid exploitation of power sector is the provision of national or foreign private sector investment. In this regard investment for the projects can be made in any of the following ways:

- Sole or joint venture of one or more private national investors.
- Joint venture of the government and one or more national or foreign investors.
- 100 percent investment of one or more foreign investors; and
- Joint Venture of national and foreign investors.

However, till date due to liberal policy adopted by the Government, many private sectors are being interested in hydro sector.

1.4. Statement of the Problem

Nepal is rich in hydropower project. A hydropower project can only be feasible if considerable amount of time is given at the initial phase of the project. The hydropower project becomes feasible only when its cost is acceptable to both the financing partners and the promoters. Real costing of the hydropower project is needed to analyze the financial viability of the project. Real costing can only be ascertained if the financial assessment of the project is adequately done.

This study focuses on the financial evaluation of Lower Modi Hydropower Project 10MW specially on following:

- Whether or not sufficient financial evaluation was done before approving the project.
- Practical application of the financial evaluation

1.5. Objectives of the Study

The study is undertaken the practical implication of the financial projection of Lower Modi 1 Hydropower Project. The major objectives of the study are as follows:

a. To study the financial projection of the project.
b. To make critical examination of the financial projection of the project
c. To ascertain the practical application of the financial projection with variance analysis.
d. To analyze the problems faced by the project
e. To provide recommendations and suggestions if any.

1.6. Significance of the Study

Hydropower is economic, non-polluting and environmentally benign source of energy. Out of 83000 MW potential, only 50 percent is technically feasible. But till the date only 606 MW has been harnessed and about 100 MW under construction. That means less than 1 percent have been developed out of which 99% of yet to be developed. In the line of the fact, research, analysis and development of hydropower is very essential from the view of economic development of the nation and uplift the overall economic condition of the people of Nepal.

This study facilitates in financial projection of the upcoming hydro project. Not only that, the developer of the project can also find data for their need. As there is no such study in Nepal, most of the hydropower developers are in dilemma to invest money in the field. It helps to provide actual information in the field with accurate financial projection. Investment in the project starts only with the involvement of the cost. Cost factor is very vital for the project.

The study will point out the problems in this field that will enable the developer, financing institution and the government for planning in the future to move ahead in the field. It certainly helps the policymaker of the government for formulating and amendment of hydropower policy and program in the future.

The study aims at providing the status and fact in the hydropower field focusing the private investment in the hydropower in Nepal which will enable the financing institutions and hydropower developers to choose the least cost and high return project. That certainly helps to reduce the electricity charge to the consumer and Nepal can sell the electricity in cheap price to the neighboring countries. Similarly, the study will find out the problems then provide the suggestion and recommendation for improvement in the field of planning to distribution of electricity. It helps to attract private hydropower developers, which enables rapid hydropower development in the country.

In such a way the study will be beneficial to the government as well for formulating the best strategy and policy; to the investor for section of least cost and high return project; to the financer for least risk and high return project; to the consumer for cheap electricity; and to the student and researcher for providing real and authentic information for their study. Hence the study will be equally important to all of the above.

1.7. Limitations of the Study

Every study and research will not be free from some weakness and obstacles. The study is limited to certain boundaries for which future new researcher will try to find out the fact in more detail.

The scope of the study is limited to the financial projection of only one project. The research is based on the information and data available from the website of Nepal Electricity Authority, Ministry of Water Resource, and the journal, magazine, reports of Nepal Hydropower Association and responses given by the respondents.

This study does not reflect the Hydropower Development and financing problem in the world and neighboring countries so that it is entirely based on the context of Nepal.

The basis objective of the study is to fulfill the academic requirement of Master degree of Business Studies the research can be used for particular study and it cannot be generalized. It is a collection of information and analysis of opinion of professional people, banks reports, Hydropower Developers, Financing experts.

The accuracy and reliability of the conclusions of data depends upon the published data, official records of the organization and opinion of the respondents.

1.8. Organization of the Study

This study has been organized in to five chapters. The title of each chapter is given under.

Chapter - Introduction

Under this chapter introduction deals with the background of the study, evolution, statement of the problems, scope and limitation of the study, rational of the study, methodology, objective of the study.

Chapter - II Conceptual Framework and Review of Literatures

Review of Literature mainly focuses on financial projection of Hydropower Projects in Nepal. It also tries to find out previous research works done about same topics with reference to its past & present action to be carried out. All the Research works, Intellectual Studies, Paper Presentation, Government and non-governmental publication, Financing Institutions issues and Hydropower Developers publications are reviewed and presented.

This chapter also includes the Conceptual Frameworks of this study, which includes the basic concepts, & components of financial projection of Hydropower Projects. In other words this chapter explains about fundamental aspects, key factors, and financing alternatives in the field of Hydropower financial projection. It also explains the key points, strategies and different financing conditions for Hydro Projects. This Chapter will provide overall concept elements of financial projection in Hydro projects and factors influencing it in the context of Nepal.

Chapter - III Research Methodology

Research methodology is the main organ of this study. It is used to achieve the objectives of the study. The best thesis & its practicability also depend upon the scientific research method. Therefore it includes research design, nature & sources of data, method and tools of data Collection, presentation & analysis of data and data processing.

Chapter - IV Presentation and Analysis of Data

The various types of data collected though different sources have been presented in systematic order. The collected data presented will be analyzed & interpreted sign statistical tools. In this research works, simple arithmetic mean, financial ratios percentage shall be used as required to analyze the data. Interpretation and findings will be listed at the end of this chapter. At the last some recommendations will be given for financial projection of hydropower project. Major findings of the research are dealt under this chapter. Findings obtained by the researcher upon analysis of data are summarized under this chapter.

Chapter - V Summary, Conclusions and Recommendations

Collection, presentation in systematic order & reporting in the field of financial projection of Hydropower Projects in Nepal is the main purpose of this study. Summary and conclusions are drawn on the basis of valuable information given by

the experts of that field. Hence, at the last, analyzing the collections, information and data, conclusion will be drawn and some important recommendation will be presented for further improvement and immediate action in the field of financial projection of Hydropower Project in Nepal.

CHAPTER – II

CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURES

2.1 Conceptual Framework

Financial assessment of Hydropower Project is concerned with budgeting of funds for establishment, operation and maintenance of Hydropower projects. Hydro power project construction is very difficult to construct and manage. Major cost component of hydropower projects are as follows:

Table 2.1

Cost Component

S.N	Particulars
1	Land and Land Development
2	Total Civil Works
3	Hydro Mechanical Works
3	Electro Mechanical Works
4	Transmission Lines and Sub Stations
6	Pre-operating Expenses
7	Interest During Construction
8	Project Management Cost
	Total Cost

Source: Financial Policy

Above points are dealt in brief in following paragraphs:

1. Land and Land Development

This head includes all the land required for the construction and development of hydropower project including land required for transmission line. Basically land is required for civil works and transmission line works. First of all, the requirement of land is to be determined exactly. Only then the cost involvement in land can be budgeted. Since, land is very flexible to market, its cost prediction is very hard to

determine. Current trend in Nepal is the cost of land is rapidly increasing and the detailed budgeting is required in this regard.

2. Total Civil Works

Major component and cost of hydropower project are resident with civil works of the project. Huge amount of the total cost is required for the construction of civil works. Around 60% of the total cost of the project is associated with civil works. Civil works includes preparation of head works, canal, tunnel, powerhouse, forebay, desander etc.

3. Hydro Mechanical Works

Hydro Mechanical Works includs but not limited to, supply, manufacture, quality assurance, testing before dispatching, delivery at site, installation, testing and commission, guarantee services and remedying of defects after commissioning of all the Hydro Mechanical Components. Penstock pipe gates and trash racks are the major hydro mechanical components.

4. Electromechanical Works

Major Electromechanical works includes fabrication, installation testing of turbine generator, valve, governor etc. Electromechanical works can be regarded as the heart of the project. Most of the electro mechanical equipments reside within the power house. The electromechanical equipments are costlier and are to be imported from foreign nations. So, budgeting in this head are very critical in fact.

5. Transmission Line Works

Transmission line works includes the transmission of generated power to the Substation. It includes fabrication and installation of towers, installation of wire for transmission line etc. Its cost involvement depends upon the nature of work and the length of power house to the substation. More the number of towers more will be cost involvement.

6. Pre operating Expenses

All the administrative expenses incurred before the power generation are under this head. Fixed assets and current assets required for the administration of the project are categorized under this head.

7. Interest During Construction Period

Equity capital is not sufficient for construction of hydropower project. Hence, Financing is required to meet the budgeted fund required for various activities. Financing is concerned with the planning and controlling of firm's financial resources at least cost of capital/fund required for the projects. A hydropower project needs huge amounts of funds to implement the projects for them financing and development Banks, Citizenship Investment fund, Employee provident fund and commercial banks are financing the projects.

So, the interest arose under the borrowing are categorized under this head. Since, the interest rate is very fluctuating in nature, exact interest amount determination is rare because revision in the interest rate is normal in every project.

8. Project Management Expenses

All the expenses incurred to make a project manageable are categorized under this head. Social mitigation cost, donation and business promotion expenses are categorized under this head. During the construction of project, a lot of social as well as political demands are to be settled. So the cost incurred for their mitigations are categorized under this head.

2.1.2 Glimpse of Financial Evaluation of LM1HPP

On review of the financial projection of LM1HPP, following are the basic indicators:

A) Investment Details

The financial assessment has been made on the basis that investment has been categorized as fixed and working capital. The detail of investment is as follows:

Table 2.2

Investment Details

S.N	Particulars		Amount in Rs'000
a	Fixed Assets	-	1687,869
	Land	61,090	-
	Building and Civil works	1,031,553	-
	Plant and Machinery	435,420	-
	Pre operating Expenses	159,806	-
b	Working Capital	-	31,987
	Total Investment Required		**1,719,856**

Source: Audited Annual Report 2067/68

B) Source of Finance

Source of Finance of LM1HPP has been categorized as below:

Table 2.3

Source of Finance

S.n	Particulars	%	Amount in Rs'000
A	Long Term Finance	73.6%	1,265,859
B	Short Term Loan	1.4%	23,990
C	Shareholder's equity	25.0%	430,007
	Total	**100.0%**	**1719,856**

Source: Audited Annual Report 2067/68

So above table reveals the fact that debt equity ratio is 3:1. The syndicated loan agreement with the bank has also been made as per the debt equity ratio as per financial assessment.

C) Project Other Assumptions

The major assumption made during the financial projection of the project is as follows:

a. Construction period

The financial assessment of the project has been estimated as 2 years.

b. Project Capacity

The total project capacity of the project is taken as 10 MW

c. Average Annual Energy Output

The average annual energy output is taken as 63.55 GWh. It is total of dry season and wet season energy

d. Dry Season Energy

Dry season energy is taken as 11.075 GWh

e. Wet Season Energy

Wet Season Energy is taken as 52.476 GWh

f. Average Energy Rate

Average Energy rate is taken as Rs. 4.52 per kWh

g. Dry Season Energy Rate

Dry season energy rate is taken as Rs.7.00 per kWh. The rate has been considered on the basis of current policy of NEA

h. Wet Season Energy Rate

Wet Season energy rate is taken as Rs. 4.00 per kWh. The rate has bee considered on the basis of current policy of NEA.

i. Annual Outage

Annual outage is the losses of produced electricity. The annual outage is estimated at 4%

j. Royalty on Capacity up to 15 Yrs

This rate has also been considered on the basis of Electricity Development Policy which is Rs. 100 per KW

k. Royalty on Capacity after 15 Yrs

This rate has also been considered on the basis of Electricity Development Policy which is Rs. 1000 per KW

l. Royalty on Revenue up to 15 Yrs

This rate has also been considered on the basis of Electricity Development Policy which is 2% of the generated revenue

m. Royalty on Revenue after 15 Yrs

This rate has also been considered on the basis of Electricity Development Policy which is 10% of the generated revenue

n. Interest Rate on Debt

Interest on debt has been taken as 9%

o. Discount Rate

Discount rate of 9% has been taken for the purpose

p. Depreciation Rate for the Project Assets

Assets are depreciated over 30 years of period at the rate of 3.3%

q. Staff Bonus Rate on Net Profit

Staff bonus has been taken at 10% of the net profit before tax

r. Corporate Tax of Profit

Corporate tax rate of 20% has been taken

s. Price increment in Energy Sales

Price increment on both dry and wet season energy at the rate of 3% has been considered as per the policy of NEA till nine years

t. Price Increment Applicability Period

Price increment of 3% is applicable only for the first nine years from the date of commercial operation. From the tenth year, this no price increment.

u. Price Increment for Expenses

Increment in expense is also estimated at 3% per year which has been matched up with increment in revenue.

2.1.3 Hydropower Potential in Nepal

The geographical constitution of Nepal, with great variations in altitude from the High Himalayas to the lowlands of the Terai over a relatively narrow width combined with abundant snowmelt and monsoon water offers tremendous energy potential for generating hydropower. A small country like Nepal accommodates some of the significant tributaries of the mighty Ganges. The major river basins of Nepal are Koshi, Gandaki, Karnali and Mahakali.

The average annual precipitation is about 1500mm, 80% of which occurs during the monsoon season (June-September). The gross theoretical hydro potential of Nepal's rivers, based on average flows has been estimated at 83,000 MW as shown in the table below. Potential sites are expected to generate about 51 % of this theoretical potential on economically feasible terms.

Water is one of Nepal's chief resources. There are numerous small lakes and over 6,000 small and big rivers. In their upper and middle reaches, the rivers typically flow in narrow valleys with sharp falls, which provide excellent opportunities for run-of-river type hydroelectric power development. In contrast the valley configurations in the lower reaches before the rivers debouche onto the southern plains provide favourable conditions for storage type development.

The total available surface runoff is 224 billion m^3 and the rechargeable groundwater potential, 12 billion m^3. The rivers of Nepal contribute up to 45 per cent of the total run off (and 71 per cent of the lean flow) of the Ganges River. The snow-fed Karnali, Gandaki and Kosi are Nepal's major river basins; with 71 percent of the total catchments in Nepal, they collectively contribute 71 per cent of the total runoff in the country. The Babai, West Rapti, Bagmati, Kamala and Kankai rivers originating in the lower Himalayas are also important rivers contributing 18 per cent of the total runoff. In addition, there are numerous small rivers and rivulets suitable for small hydro development.

Table 2.4

Theoretical Hydro Potential of Nepal (GW)

River basins	Small river courses (Catchment areas of 300-1000 km^2)	Major river courses (Catchment areas >1000 km^2)	Total	Economically Feasible Capacity
Sapta Kosi	3.6	18.75	22.35	10.86
Sapta Gandaki	2.7	17.95	20.65	5.27
Karnali and Mahakali	3.5	32.68	36.18	25.1
Southern rivers	1.04	3.07	4.11	0.88
Country Total	10.84	72.45	83.29	42.13

Sources: NEA Library, Hydropower Potential in Nepal

Nepal’s reliance on its water resources, particularly for hydropower is basic and will continue far into the future. Nepal wishes to expeditiously harness and properly manage and share this resource to meet the ever-growing need for various uses of

water and clean energy both in the country and in the sub-continent in order to achieve economic prosperity and a better quality of life for the people.

2.1.4 Comparison between Hydropower and Other Sources of Energy

We look briefly at the various energy options, and see how they compare with hydropower. It is clear that, whether we like it or not, across the world there will still be a dependence on fossil fuels because of the scale of future energy requirements, and also because there is a tendency – particularly today with the increasing participation of private developers – to opt for the 'easier' option. In comparison with hydro, thermal plants take less time to design, obtain approval, build, and recover investment. But once built they have higher operating costs, typically shorter operating lives (about 25 years) and they are of course major sources of air, water and soil pollution and greenhouse gas emissions.

In parts of the Asian region where there is still a strong dependence on thermal power generation, air quality problems are evidenced clearly by frequent smog, and damage to crops caused by acid rain.

Nuclear power is still considered an additional option in some countries, but past accidents at Three Mile Island in the USA, and Chernobyl in the former USSR – the latter having had both local and very widespread catastrophic effects – also gave signals to the world about the potential dangers which can be associated with this technology, and while some countries have quite a high dependence on nuclear power, such as France, for example, there is also quite a widespread public rejection of it, with many countries having a moratorium on future nuclear development.

Therefore, the renewable sources of power, while they clearly face economic disadvantages compared with fossil fuel-based plants, have a great many advantage to offer our planet, and it is clear that they should not be in competition

with each other, but should be regarded as complimentary. Moreover, due to recent earthquake and tsunami in Japan, an explosion at a Fukusima nuclear power facility has blown the roof and walls off a building there, releasing dangerous radiation of unspecified proportions into the oil. Japanese Government has advised people within even larger radius to stay indoors and breathe through wet clothes. Most of the people were warned and have placed at safe place in order to minimize with the harms from such nuclear leakages.

Moreover, due to disaster in Japan, Germany coalition Government has announced a reversal of policy that will see all the country's nuclear power plants phased out by 2022 AD. (BBC 30th May 2011). There have been mass anti nuclear protests across Germany in the wake of March's Fukusima crisis, triggered by an earthquake and tsunami.

Some other renewable sources in addition to hydropower can be promising for the future, especially wind and solar power. A significant potential has been identified for both in some regions, but today there are still major shortcomings: first, even if major efforts were made to develop them, they could not produce the large amounts of power which will be necessary for future decades, or to offer the same level of service. As they are both intermittent sources, it has to be remembered that they require some sort of back-up supply and in many cases these may have adverse environmental impacts, which have to be taken into account.

After hydro, wind power is probably the renewable source with the greatest potential – according to UNDP. Quite a few countries have invested in wind power developments, for example Spain, Morocco, Germany, Denmark, the USA and Australia. But apart from the problem of intermittent supply, another point, which should be acknowledged, is that wind power is not without its environmental impacts and if implemented on a large scale, it would certainly face some opposition from the green NGOs.

Finally, in comparing the various options, coming back to the point that hydropower, particularly when developed with a storage reservoir, is the only source of power, which can offer additional benefits, such as irrigation, water supply, flood control, fisheries development, and also recreational facilities.

Above case clears that hydropower projects are not even expensive besides its numerous advantages over thermal if the size of the plant became larger.

Advantages of Hydropower

The following are the advantage of hydropower over other source of Energy.

Non Polluting: It is a non-polluting source of energy with high conversation efficiency and does not contribute to Green House Effect where as to generate billion units by thermal generation; one million tons of carbon dioxide is released into atmosphere. One cannot imagine the need of trees required to be planted to counter its effects. Conversion efficiency of Thermal plant is also about 40% against 85% of Hydro which means that for every one million units actually generated, 1.5 millions are being wasted and are thrown into atmosphere.

Multi Purpose: Storage type Hydro projects provide addition benefits of flood control, irrigation, drinking and industrial water, Navigation and tourism. The low temperature water from the Reservoir is provided to a super Thermal Plant downstream for meeting its requirements.

Cheap Power: As compared with other sources, generation cost of hydropower is quite less. Actually it becomes cheaper with passage of time. With the passage of time the present day cost of generation is $ 1/666 as compared to $ 1/20 with Thermal station set up during same time. With the passage of time the cost of generation of Project will remain almost same whereas that of the old thermal plant will go on increasing (Rudra Nath Baral, 2004).

Longer Life: As compared to life of 25 years of Thermal plant the envisaged life of hydro plant is 35 years. But in actual the life of hydro plant is much more and with minimum renovations, the life of hydro plant can be enhanced considerably.

Reliable Source : As the hydro plants can be started/synchronized and raised from no load to full load in minutes, as they can pick up and drop load as per requirement of system and as their forced outages are rare and as they require minimum minute. The hydropower can be well described as reliable source of energy. The plant availability in case of Hydro plant is generally of the order of 85% and as compared to thermal we can avail the same benefits and results if we set up hydro plants of capacity of 66% the thermal capacity. Due to above facts Hydro plants contribute substantially to overall system stability and reliability and results into optimal operation of system (Rudra Nath Baral, 2004).

Overall Development: As hydro plants are located in difficult area their setting up improves the Road Rail link communication; they provide employment and gear up the economy of that region.

2.1.5 Government Policies & Legal Evaluation

Following the promulgation of Nepal's constitution of 1990, numerous Acts, Regulation and Policies have been enacted to promote the hydropower sector through the participation of the local and foreign private investors. Acts and Regulations introduced by the government of Nepal for the promotion of the hydropower sector and assess how they facilitate the development of the sector in general. Review of existing Policies, Acts and Regulation has been illustrated below shortly for the development of small hydropower schemes through the private sector comprising of local and international investors. The policy and Acts related with Hydropower financing has been summarized as under.

Hydropower Development Policy - 1992

Although a policy does not have the legal validity as law, it does provide the necessary guidelines to the lawmakers to formulate appropriate legislation. The Hydropower Development Policy 2001 was the basis for the water Resource Act 1992 and the Electricity Act 1992. Its main objectives have been outlined as:

Objectives

- Utilization of water resource potentiality of the country by producing
- Electricity in low cost
- Supply of qualitative and reliable electricity within the country in a reasonable price
- Linking of electrification with economic activities
- Expansion of rural electrification projects for the economic development of rural sector
- Development of hydro electricity as export commodity

Main Policies

- Encouragement provided to operate hydroelectricity on the basis of BOOT (Build-Operate-Own-Transfer) principle
- Implementation of multipurpose big storage project to gain maximum achievement out of downstream benefit
- Introduction of procedure, which is transparent and incentive, oriented in order to attract local and foreign investors
- Capital market in the country will be encouraged to invest in hydroelectricity.
- Encouragement will be provided to export electricity on the basis of bilateral and multilateral assistance

Electricity Act - 1992

Primary objectives of the Electricity Act are to develop electric power by regulating the survey generation, transmission and distribution of electricity and to standardize the quality of electricity. With the promulgation of the electricity act 1992, the development of hydropower projects in Nepal through public sector as well as private sector participation became possible. Basic feature of Electricity Act 1992 are:

- The Act requires hydropower projects larger than 1000 KW to obtain License for survey generation, transmission and distribution.
- The Act stipulates that survey license should be issued within 30 days of tendering the application and it may be provided for a period of five years.
- Generation license to be issued within 120 days of submitting the application and may be provided for a period of to 50 years.
- Repatriation facility of foreign exchange for principal & interest on debt, return on equity and sale of proceeds of the equity are permissible.
- When income tax holiday period is completed, corporate tax shall be levied ten percent less than the prevailing corporate tax.
- The Act stipulates that NRs 100 for each installed KW plus 2 percent of the average tariff per kilowatt- hour shall be paid as royalty by the developer for the first 15 years. Thereafter NRs 1,000 for each installed KW plus 10 Percent of the average tariff per kilowatt-hour shall be paid.
- Only one percent custom duties to be levied for the import of construction equipment, machines tools required for the project. No other charge shall be levied for such imports.
- It allows land acquisition for period of license, no structure shall be nationalized.
- It restricts the creation of substantial adverse impacts on environment.

Water Resource Act 1992 and its Regulation - 1993

The water Resource Act and regulations are key legislation formulated to develop the hydropower resources of the country. The Act and Regulations have made arrangements for rational utilization, conservation, management and development of the water resources available on the country. Likewise legal provisions have been made for the beneficial use of water resources and for the prevention of environmental and hazardous impact on the sources of water.

Foreign Investment and Technology Transfer Act - 1992

HMG/N has enacted foreign investment and technology transfer Act 1192 with the intention of mobilizing foreign resources in terms of money and technical know and how for the upliftment of the national economy. The act has provision regarding the promotion of private sector participation in the utilization, conservation, development and management of water resources. The main features of the act are summarized below.

- 100% of foreign investment is allowed.
- Foreign investment in large and medium scale industries is allowed.
- Full remittance of profits, dividends and repatriation of capital is allowed.
- Provisions for the transfer of Technology in cottage and small industries have been made.
- Security of foreign investment is guaranteed.
- Attractive facilities, incentives, concessions are given to the industries.
- No income tax shall be imposed to a foreign investor on the interest income earned from foreign loan.

Special Facilities Provided to Attract Private Sector Investments

i. **Types of Licenses and Validity :** Study/Survey- within 30 days with 5 - year's validity; project license- within 120 days with 30 - years validity for domestic Supply and 30 years for export; transmission & distribution License 25 year's validity.

ii. **Incentives: Income Tax :** Generation: 10 years tax holiday and 50% tax holiday for next five years (Annual Budget of Government of Nepal for F/Y 2068/69)

iii. **Incentives: Import Concessions:** For plant and equipment, including construction equipment 1 % custom duty; No import license fee; VAT not charged on imported materials and equipment if not included in electricity tariff (Annual Budget of Government of Nepal for F/Y 2068/69).

Industrial Enterprise Act - 1992

The industrial Enterprise Act 1992 is an umbrella act that governs the overall industrial sector, which considers hydropower as an industry as well. The main features of this act are:

- The act assures the private investors financiers and developers that no industries shall be nationalized.
- Facility and income tax holiday have been provided

Electricity Regulation - 1993

The Government of Nepal has enacted Electricity Regulation 1993 which along with other provisions has also elaborated the procedure of obtaining license for survey generation, transmission and distribution. The following are provisions related to the promotion of private sector participation in the utilization, conservation, development and management of hydropower.

- The regulation provides for the exemption of license for developing a project up to 1000 KW.
- It Stipulate the need for survey license required for the production, transmission and distribution of Electricity.
- Feasibility study report to be accompanied by EIA for acquiring the license.
- Permission is required for import of Electricity.
- Ensures the licenses right to use the water for the production of electricity as specified in the license.

NEA Policy Regarding Small Hydropower - 1998

The Nepal Electricity Authority has formulated a policy to encourage small hydropower developers from the private sector. The policy was first announced in July 1998 and was subsequently amended in December of the year. The main features of the policy are:

- Fixed buy back rates for plants up to 1 MW.
- Standard power purchase agreement for power plants of up to 5 MW
- Commitment to buy all power generated by power plants of up to 10 MW capacity for the first 50 MW.
- Escalation fixed at 6% for the first five years of generation
- In case of joint venture of Nepali and foreign partner, fifty percent of tariff will be provided in foreign currency and fifty percent in Nepalese currency.

2.2 Review of Different Studies

Literature review is the process of collecting the information on the same topic. The purpose of literature review is thus to find out what research studies have been conducted in one's chosen field of study, and what remains to be done. It provides the foundation for developing a comprehensive theoretical frameworks from which hypothesis can be developed for testing. The purpose of reviewing the literature is to develop some expertise in one's area, to see what new contributions can be made and to receive some ideas for developing a research design. Literature review is carried out in order to identify the repetition of the topics and it helps to shows the difference between the research done by previous researcher and present researcher.

Besides that, Literature review questions that what is already known about the subject, what is the chronology of the development of knowledge in the topics, are there any gaps about the topics, how researcher does is going to bridge the gaps, Is the issue debated or it can be solved. In such a way literature review serves the above question and prepares a researcher to find new and creative findings. Hydropower Financing is a special research topic for which very few researchers show their interest to undertake the research works. It is in the infancy stage in Nepalese context. That may be the reason that there is no any study on the same topic. But it has been considered a very important issue to deal for the development of Hydropower in Nepal.

There are very few journal and institutional bulletins in the papers published by national and international institutions. Hydropower experts have written their reports for presentation in the seminar and Hydropower associations have developed some booklets and magazine in the topics. Besides these, there is no any formal research, or study in Nepal. But there are a lot of study and exploration on the topics in the country like India, China, and Norway. The researcher has

reviewed and collected some information in regard to Nepal through the above said source that has been demonstrated below.

Hydropower Database: This database book was compiled and published by Nepal Hydropower Association to release of hydropower database of Nepal .The main objective of the book is to examine and collect the information regarding the hydropower projects developed by both public and private sector in Nepal. It also intended to provide the knowledge of the expertise and Name & address of the Experts, Developer and Financing Institutions. National and international financing institutions, reports and expert's opinions are reviewed from the book. It aims to provide detail information about the hydropower technical aspects and little information about the financing matter.

Urja- Energy for Development: This magazine was published by Rural Energy Development Programme to provide the latest information and new activity done in the field of Energy and Hydropower in Nepal. The main objective of the bulletin is to provide and share the latest information and support the organization in the field of energy including micro hydro in Nepal. Financing and technical assistance information has also been presented.

Annual Report of Nepal Electricity Authority (NEA) 2009: The magazine, Paper, journal and annual Reports issued by the Nepal Electricity Authority in 2009 have been reviewed. In the reports the publisher has intended to provide the information regarding the latest activity, annual profit and loss statement and financing & investment plan for the forthcoming years.

The bulletin and annual reports published by the Nepal Rastra Bank, hydropower developer, Himal Power Limited, Butwal Power Company and Chilme Hydropower Company have been reviewed and got information about their company, financial status, future plan and investment and financing scheme. The

main objective of the study was to collect the information. Available audited financial statements have also been reviewed

Report on Micro- Hydropower Programme in Nepal, 2005: This report was prepared by the Nepal National Team and intended to provide the information and share the analysis on the status of Hydropower in Nepal and review of the policy.

The main objective of the study was to identify the present status of Micro hydropower in Nepal, viability and feasibility of the Micro hydro Programme. Data collection through the interview and analysis of opinion of the experts were used in the research methodology. It has presented some findings and recommendation in the policymaking level and operational Level. This reports has focused mainly in the technical aspect and has not discussed detail in financial aspect. Hence the recommendation has been given in the technical level (Rudra Nath Baral, 2004).

Beside the above books and journal and reports on the topic of the Financing of Hydropower Project in Nepal, there has not been any study particularly in the field of financing.

2.2.1 Review of Previous Research Works

Mr. Baral (2004) has studied on "*Financing in Hydropower* Projects *in Nepal"*. The purpose of the research conducted by Mr.Baral has been summarized as below:

Objectives:

- To study the present financing pattern of the hydropower projects of Nepal.
- To find out the problems of Financing Institutions for investment in hydropower projects.

- To analyze the problems of the private developer in arranging finance for their Hydro Projects.
- To provide suggestion on the basis of the findings to the Hydropower Developer, Financing Institutions and Government

Major Findings:

- Problem in Energy Sale
- Political Social Problem for financing in Hydro Power Project
- Lack of Genuine Developers and Equity arrangement
- Unstable Government Policies
- Lack of Real Costing of Hydro Power Project

The research conducted by Mr. Baral has only traced out the financing pattern in context of our nation but the research is silent about the financial evaluation of the project. The research has given his recommendation to the financial partner and the Government for the improvement in the financing of Hydro project.

Mr. Subedi (2008) has studied on "*Fund Management of Hydropower Companies*, (With special *reference* to Chilime Hydropower Company Limited, Butwal Power Company Limited and National Hydropower Ltd.)".

The purpose of the research conducted by Mr. subedi has been summarized as below.

Objectives:

- To draw the overviews of the development of private and public hydropower companies in Nepalese hydropower sector

- To evaluate the fund management and financial position of public hydropower companies with the help of various financial tools.
- To analyze the present trends of public hydropower companies.
- To suggest and recommend possible guidelines on the basis of major findings.

Major Findings:

- Current ratios were in slightly fluctuating trend for CHPCL, BPC and NHPL. All the three companies could not maintain the conventional standard of current ratio 2:1. However the average ratio of BPC was greater than that of CHPCL and NHPL, which signifies that BPC was more capable of meeting immediate liabilities than other companies.
- Long term debt to net worth ratio showed CHPCL and NHPL had higher long term debt in the beginning of years and it was in decreasing trend. It shows that both companies were repaying their debt and they were in sound position. Average ratio in NHPL was higher than that of CHPCL.
- In the beginning of two years, the companies applied higher of their fund in investing activities because they had to acquire fixed assets and to set up business. After the commercial operation started, CHPCL and NHPL applied their funds in financing activities for the repayment of long term loan.

  The research conducted by Mr. Subedi has only traced out the financial position of the companies but the research is silent about the financial evaluation of the project. The researcher has given his recommendation to the concerned companies to improve their financial position.

Mr. Karki (2009) has studied on "*Financial Performance Evaluation of Private and Public Sector Hydropower Companies in Nepal*, (A comparison between Butawal Power Company Limited and Himal Power Limited,)".

The purpose of the research conducted by Mr. Karki has been summarized as below.

Objectives:

- To study and analyze the financial performance of BPC and HPL and draw comparative conclusion through financial evaluation taking relevant variables.
- To identify major strengths and weaknesses of BPC and HPL
- To study and examine the present trends of financial performance of private and public participation in hydropower sector.
- To provide necessary suggestions on the basis of study findings.

Major Findings:

- The liquidity of both the companies has satisfactory but to compare each other BPC cut off current liabilities to maintain a proper liquidity position.
- Fixed assets turnover ratio of BPC is satisfactory but total assets need to be managed more efficiently by both companies. BPC needs to find better ways to control and improve its receivable.
- The hydropower sector should follow the practice of setting financial goals for future activities and should develop major programs to accomplish them.
- Government of Nepal should formulate plans and policies to attract private sector as well as public investors for growth of hydropower companies creating investment friendly environment and focusing on their security in the hydropower development.

Mr. Koirala (2009) has studied on "*Investment Analysis of Hydropower Project in Nepal,* (A comparative study of Chilime Hydropower Project and Middle Marsyandi Hydropower Project)".

The purpose of the research conducted by Mr. Koirala has been summarized as below.

Objectives:

- To study and examine the investment process and financial viability of hydropower projects.
- To evaluate and analyze the investment in hydropower plants by foreign investment and Nepalese investment.
- To assess the purchasing price per unit of power by domestic investment and foreign investment.
- To provide suggestions to the concerned hydropower projects on the basis of study findings.

Major Findings:

- Both power projects are funded with equity and debt capital. However, MMHEP would be funded with 90% debt and 10% equity capital while CHP is funded with 60% debt and 40% equity capital. The weighted average cost of capital is 15.124% and 11.44% respectively.
- Both the project had been evaluated by applying only one tools of capital budgeting " The Internal Rate of Return" from the point of feasibility study to the completion of projects though there are several technique for evaluation of project. The researcher applies all the capital budgeting tools for evaluation of project.

- Both the projects are financially feasible and would prove to be profitable investments. However, CHP is better investment project than MMHEP investment project in terms of cash payback period, discounted payback period, accounting rate of return , alternative accounting rate of return, internal rate of return and benefit cost ratio/profitability index. Similarly MMHEP is better investment project than CHP investment project in terms of net present value.

Mr. Khatiwada (2010) has studied on "*A Comparative Study on Financial Analysis of Hydropower companies in Nepal"*.

The purpose of the research conducted by Mr. Khatiwada has been summarized as below.

Objectives:

- To study and analyze the financial performance of BPC, CHPCL and NHPC.
- To identify and examine the major strengths and weakness of BPC, CHPCL and NHPC.
- To evaluate the past and present challenges of hydropower projects in Nepal.
- To study and present financing pattern of the hydropower projects in Nepal.
- To provide suggestion to the hydropower companies on the basis of study findings.

Major Findings:

- The electricity generation cost was very high and there is huge loss in transmission and distribution of electricity as a result cost of electricity

becomes quite high. Due to high tariff of electricity, lower investment in hydropower and political interference it is very difficult to increase the domestic consumption of electricity substantially to the existing customer.

- Debt to assets ratio was in increasing trend for CHPCL and NHPC and it is higher in NHPC than CHPCL which shows assets of NHPC was financed through the outsider fund i.e interest bearing fund.

- The average ratio of CHPCL of return on shareholder's equity was higher than that of BPC and NHPC.

- Debt to equity ratio was in decreasing trend for CHPCL and NHPC. This shows that both the companies had used more equity financing than debt financing as a result interest expenses were low in both the companies. There was no debt capital in BPC and it was fully financed by equity and hence less risky than other hydropower project.

- Earnings per share of the CHPCL, NHPC and BPC are not satisfactory.

2.2.2 Review of Articles

Mr. Thapa and Mr. Pradhan (1995) said in an article Energy sector perspectives that hydropower is Nepal's major resource endowment numerous attractive run off river and multipurpose hydro schemes have been identified but remain undeveloped, small and micro hydro potential remains virtually unused in the hill and mountain areas and despite Nepal's small sized, only about 10.50% of the population have access to electricity supply, where as about 40% of domestic connections are concentrated in the Kathmandu Valley.

Mr. Pradhan (2007) in his article "Challenges and Issues on the Domestic Hydropower Projects and Prospective on Export Oriented Hydropower Projects"

has written about hydropower potential, hydropower generation, existing status, power demand forecast by 2020 for domestic scenario and power generation expansion. He said about hydropower potential of Nepal that the Karnali and Mahakali river systems represent approximately of Nepal theoretical hydropower potential and 55 percent of the technical/economical potential.

2.3 Research Gap

The researcher tried his best to find out the research work on similar subject but could not find any research on the financial analysis of hydropower project. Only few research work found in the field of hydropower projects.

Hence, there is no any research gap for the researcher and the researcher claims that this is the first research made in the financial analysis of hydropower project. Since, no research work has been made on financial analysis of the hydropower Project, the researcher is interested to make a research on financial analysis and an effort has been made for the same and researcher believes that this research will be very first guidelines for financial analysis of other hydropower projects. The new researcher can take this research as a guideline and the researcher believes that this research is very advantageous to new researcher, hydropower entrepreneurs, financial institutions and Government.

CHAPTER- III

RESEARCH METHODOLOGY

3.1 Introduction

The research methodology is the way to solve the research problem in order to make any type of research systematically, which fulfills the objective of the study. The basic research methodology adopted in the study is the collection and analysis of primary and secondary data through the structured questionnaire and interview technique. Primary data shall be collected by interview and questionnaire method. Secondary data shall be collected through the desk study.

3.2 Research Design

In the above circumstance, the researcher has chosen the topic of Financing in Hydropower Project. The topic seems simple but very difficult to elaborate and go insight. To meet the objective the study, the researcher has planned to carry out the research works based on the personal interview, questionnaire and expert opinion method. The research has been mainly based on primary as well as secondary data. The brochure, annual report, expert opinion, web page information have also been included in the study.

Research design is the strategy for conducting research. It includes the general frameworks for collecting, analyzing and evaluating data. Research Design is the plan, structure and strategy for investigation conceived so as to obtain answers to the research problems. The descriptive as well as theoretical research design will be adopted in the study. The research design adopted in the study will be collection of information through the primary and secondary data collection technique. The data will be analyzed using the average and ratio analysis technique.

The main objective of the study is to highlight the facts of present status and outline the problems of financing & investing hydropower projects in Nepal. This is obtained through the analysis. The research design adapted to carry out the research work is both descriptive and exploratory. This method is most suitable to achieve the objective and solve the distinguished problem of financing in hydropower Projects.

The research will examine and try to determine the solution of the distinguished problem of financing in hydropower sector and recommend the suggestion for the improvement both for public and private sector through the analysis of filled questionnaire, document review, expert opinion in systematic manner.

3.3 Populations and Sample

The population for this study is all the hydropower projects in Nepal but the sample comprised of only one hydropower project. This study is based on the data of Lower Modi 1 Hydropower Project. Since the project is under construction, the data for the previous three fiscal year and the current data of Fiscal Year 2068/ 69 has been considered. Budgetary analysis has been focused as a matter of research.

A detailed scrutiny is planned to be made on the budgetary analysis of the project to depict the sufficiency and adequacy of the budgeted amount.

Moreover, a personal interview is also to be made with the respective personnel and experts of the project to acquire more accurate data.

3.4 Data Collection Procedure and Period Covered

Structured questionnaires were designed on the basis of the data and information requirements. The personnel interview schedule was administered to the expert and experienced/professional people on the premises of their office and resident. Questionnaires were designed in simple wording so that everybody could easily

understand and fill up for hydropower developers and financing institutions. Questionnaires were given to the personnel of the project requested to fill up within a week time frame. They were assured that the information filled by them would be kept confidential. Everybody could not spare time to fill up the questionnaires that were filled by researcher on their verbal answer. Secondary data were collected through the analysis of annual report of company, company brochure, speech paper and searching on Internet and web pages.

3.5 Nature and Sources of Data

The research work is constraints due to limited time, resources and budget. To attain the objective of the study both primary & secondary data have been used and they were obtained as under. The supplementary data and information were obtained from the website which may be inaccurate. But the researcher has collected the information to support the secondary information. The basic research method adopted in this study was collection and analysis of primary and secondary data/information. Primary data were collected field interview technique is used for the collection of information from expert, professional. Data were collected in two stages; the secondary data were collected through desk study, searching in web page, collecting published materials and information.

3.5.1 Source of Primary Data

The primary data were collected from structured questionnaire and the personal interview method mostly. Two separate structured questionnaires were designed one for the hydropower developer and another for Local Financing Institutions to collect the required information and data in the field of hydropower financing. A common and general guideline was developed to interview with professional and experts.

Data Collection from hydropower Developers

These questionnaires were prepared for various personnel of hydropower project developers who were officer level in their organization The people contacted were key person who had participated in the hurdle.

Data Collection from local Financing Institutions (LFI)

The second types of structured questionnaire were given to the representative of the LFIs who were all senior level employee. Eight to ten respondents who were selected on the researcher judgment basis, contacted to fill up the questionnaire. It was very difficult to fill up the questionnaire as they were policy level people and was very busy. Therefore researcher filled up the questionnaire on the basis of their verbal answer through telephonic conversation. It is expected that the information and data given by them were correct.

Data Collection through Interview with the Experts

Various persons were met in the field of financing and development of hydropower project in Nepal. All of them have given very useful information regarding the financial projection. In such a way researcher has collected the primary data /information.

3.5.2 Source of Secondary Data

The secondary information was collected by collecting information the available books and other published materials in the hydropower of Nepal. But main materials of study were the reports, proceeding of the seminars & workshops, web page surfing and the articles related to financial projection of the hydropower. The main sources are Internet, NEA Library, Nepal Hydro Power Association (NHA), and Alternative Energy Promotion Center, United States Development fund-Energy development literature.

The audited financial statement and the budget of the project has been obtained to fulfill the objectives of the research.

3.6 Data Processing Technique

The collected data, which were obtained from different sources, were not appropriate form to analyze. Therefore all the data collected were separated and categorized as per their relevancy and compiled in appropriate forms. All the data were not relevant and appropriate for the study. The data were described by presenting in the light of theoretical basis using different tools and technique of budgeting of hydropower project. Similarly the collected data were presented and arranged in tabulated forms, percentage, ratio, graphs, table are presented. Collected data are tabulated in suitable table format.

3.7 Data Analysis Tools

Data collected from various sources were managed, analyzed and presented in proper as well are systematic way. Table and graphs are used to analyze and interpret the data. The major statistical tools are not relevant to use in the study, as the study is descriptive. Hence, tools used for analysis of data are percentage, simple arithmetic mean. As the data collected through the study were descriptive and non numerical for which the researcher has not used any statistical tools. Then the data are presented in suitable table.

CHAPTER – IV

ANALYSIS AND PRESENTATION OF DATA

4.1 Introduction

In this chapter the researcher has analyzed the data collected through the primary and secondary sources. Beside these the researcher gathered the information collected through the experts, professional people from opinion Survey and interview. Both the positive and negative aspects of the subject matter presented at the end of the analysis. Relevant studies have been observed order to assist the study and compare the data with real situation. The data were collected from the secondary as well as primary source of information.

4.2 Analysis of Secondary Data

The secondary data, which were, collected through published materials of the hydropower Association, But main materials will be the reports, Paper presentation and the articles related to financial projection of the hydropower. The main sources are Internet, NEA Library, Nepal Hydro Power Association (NHA), brochures, company profiles and newsletters, webs sites of various companies. All the information and data collected through the sources are analyzed and presented as following. The financial projection of the said project has been deeply analyzed for the attainment of the objectives of the research.

4.2.1 Analysis of Budget of the Project

Lower Modi 1 Hydropower Project (10MW) has been budgeted at Rs. 164 Crore detailed as below:

Table 4.1

Budget Cost Data

Particulars	**Amount in Rs.**	**%**
Total Civil Works	984,651,219.21	60.00
Hydro Mechanical Works	19,458,600.00	1.19
Electro Mechanical Works	288,165,937.50	17.56
Transmission Lines and Sub Stations	83,307,131.25	5.08
Land and Land Development	59,107,000.00	3.60
Pre operating Expenses	35,708,000.00	2.17
Interest During Construction	170,665,000.00	10.40
Total Cost	**1,641,062,887.96**	**100.00**

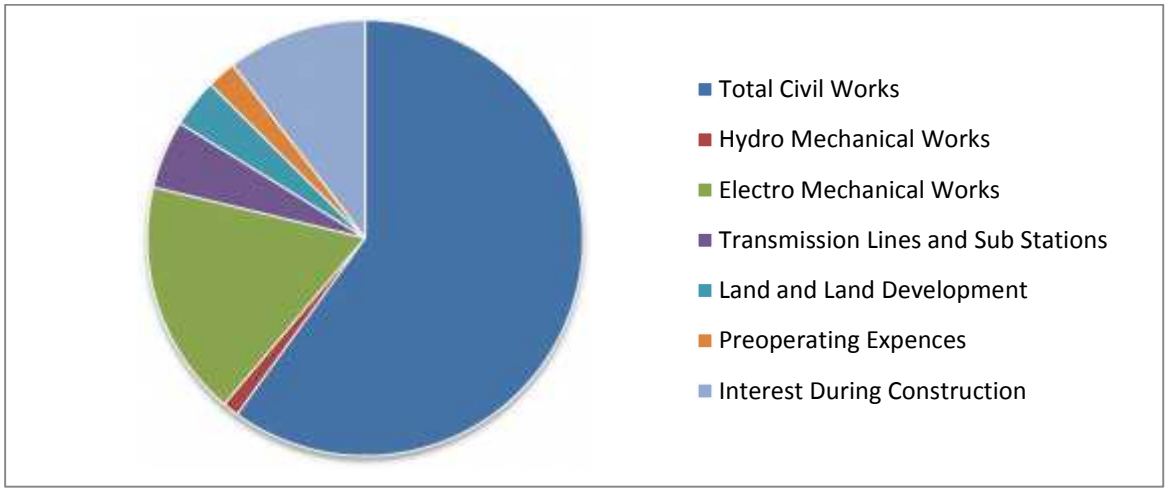
Source: Audited Annual Report 2067/68

From the above table, it can be clearly seen that the civil works of the project consist almost 60% of the cost component. Second major chunk of the project cost is electromechanical works comprising 17.56% of the total cost. Third major chunk of the project cost is Interest during Construction Project comprising 10.40 of the Project cost.

Above data can be shown in diagram as follows:

Figure 4.1

Total Cost Component of the Project



Source: Table 4.1

4.2.2 Actual Cost Incurred Till End of February 2012

An attempt has been made to obtain the latest data. The researcher could only obtain the data till end of February 2012. The actual figures till end of February 2012 have been tabulated as below:

Table 4.2
Actual Cost Incurred

S.N	Particulars	Actual in Rs
I	**Civil Works**	
A	Headrace Canal	175,183,146.47
B	Aqueduct	-
C	Desalting Basin	114,462,868.46
D	Forebay	14,722,695.05
E	Head Works	234,444,574.34
F	Penstock Pipe Line	9,342,556.23
G	Power House	47,677,277.12
H	Tail Race	12,844,241.81
I	Intake Chamber	15,342,211.60
J	Spillway/Gravel Trap	26,011,006.77
K	Spillway / Approach Culvert	13,394,064.45
L	Miscellaneous Item	6,102,000.00
M	Contingencies	
	Total Civil Works	**669,526,642.29**
II	Hydro Mechanical Works	24,637,318.48
III	Electro Mechanical Works	62,637,294.00
IV	Transmission Lines and Sub Stations	8,890,000.00
V	Land and Land Development	72,179,934.00
VI	Pre operating Expenses	36,865,802.65
VII	Interest During Construction	54,748,633.68
VIII	Project Management Cost	52,635,165.22
IX	Current assets (Stocks, Deposits, Others)	118,266,198.73
X	Fixed Assets	3,355,095.69
	Total Cost	**1,103,742,084.74**

Source: Half yearly progress report to Bank, 2068/69

Till the end of February 2012, out of 164 Crore, 110 Crore has already been expended. So, the total financial progress of the project is carried out to be 67%.

4.2.3 Budgeted Vs Actual

Comparison of budget v/s actual data has been presented as below:

Table 4.3
Budgeted Vs Actual

S.N	Particulars	Budgeted	Actual	Deviation from Budget	%
I	**Civil Works**				
A	Headrace Canal	288,408,858.23	175,183,146.47	113,225,711.76	39.26
B	Acqueduct	4,079,250.28		4,079,250.28	
C	Desilting Basin	123,256,478.74	114,462,868.46	8,793,610.28	7.13
D	Forebay	50,540,391.30	14,722,695.05	35,817,696.25	70.87
E	Head Works	202,722,829.36	234,444,574.34	(31,721,744.98)	(15.65)
F	Penstock Pipe Line	25,514,236.16	9,342,556.23	16,171,679.93	63.68
G	Power House	96,918,964.59	47,677,277.12	49,241,687.47	50.81
H	Tail Race	78,548,089.07	12,844,241.81	65,703,847.26	83.65
I	Intake Chamber	10,036,317.10	15,342,211.60	(5,305,894.49)	(52.87)
J	Spillway/Gravel Trap	24,017,989.23	26,011,006.77	(1,993,017.53)	(8.30)
K	Spillway / Approach Culvert	20,724,661.84	13,394,064.45	7,330,597.39	35.37
L	Miscellaneous Item	12,995,000.00	6,102,000.00	6,893,000.00	53.04
M	Contingencies	46,888,153.30		46,888,153.30	
	Total Civil Works	**984,651,219.21**	**669,526,642.29**	**315,124,576.91**	**32**
I	Hydro Mechanical Works	19,458,600.00	24,637,318.48	(5,178,718.48)	(26.61)
II	Electro Mechanical Works	288,165,937.50	62,637,294.00	225,528,643.50	78.26
III	Transmission Lines Sub Stat.	83,307,131.25	8,890,000.00	74,417,131.25	89.33
IV	Land and Land Development	59,107,000.00	72,179,934.00	(13,072,934.00)	(22.12)
V	Pre operating Expenses	35,708,000.00	36,865,802.65	(1,157,802.65)	(3.24)
VI	Interest During Construction	170,665,000.00	54,748,633.68	115,916,366.32	67.92
VII	Project Management Cost		52,635,165.22	(52,635,165.22)	
VIII	Current assets		118,266,198.73	(118,266,198.73)	
IX	Fixed Assets		3,355,095.69	(3,355,095.69)	
	Total Cost	**1,641,062,887.96**	**1,103,742,084.74**	**537,320,803.21**	**32.74**

Source: Half yearly progress report to Bank, 2068/69

Above table is the comparison of the budgeted Vs actual data till end of February 2011. Above table clearly reveals the fact that though the civil cork is within the budget. However, some sub head of the civil work such as head works, intake chamber, spillway/gravel trap has exceeded the budget. Cost has been significantly increased by 52.87 % in case of Intake Chamber.

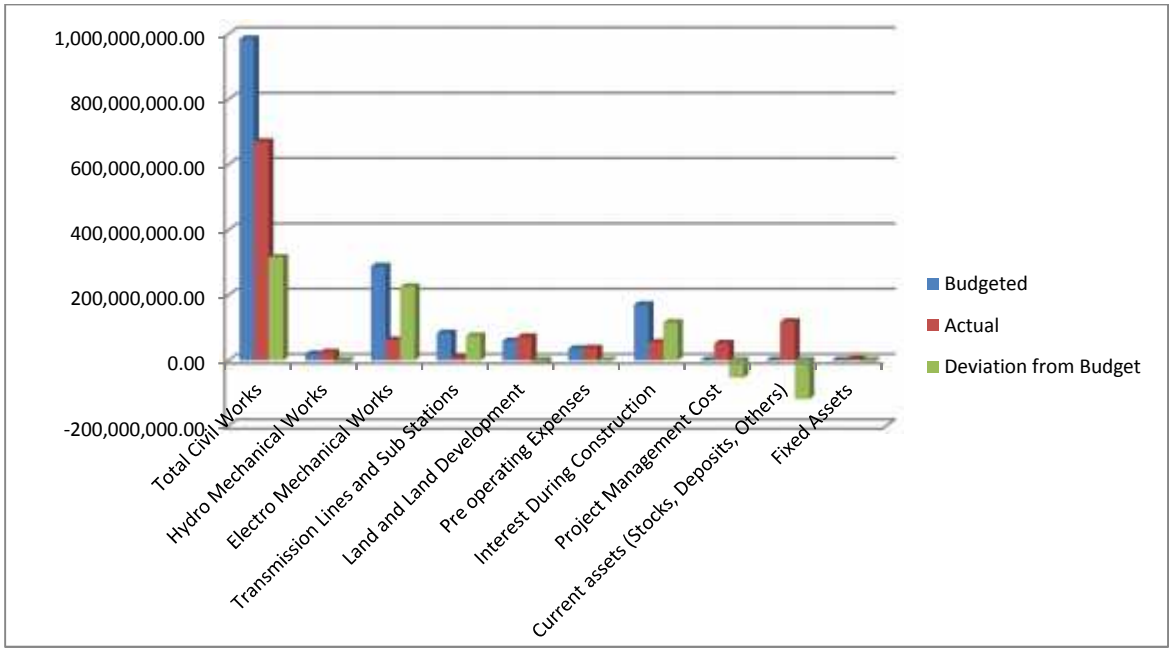
Similarly, hydro mechanical, pre operating expenses, and land has already exceeded the budget by 26.61 %, 22.12% and 3.24 % respectively.

One thing is to be noted that current assets, fixed assets and project management cost has not been included in budget, however, cost has also been incurred under these headings. So, over all financial progress on the basis of above table is carried out to be 67%

Above data can be diagrammatically shown as below:

Figure 4.2

Budgeted Vs. Actual



Source: Table 4.3

4.2.4 Budgeted Estimated Cost of the project till completion

The researcher has also tried his best to find out the total actual cost of the project till the completion. The total estimated cost of the project till the end of the project is calculated as below:

Table 4.4
Budgeted Estimated Revised Total Cost of the Project

S.N.		Budgeted Estimate Amount	Revised Total Cost	Increase(-) Decrease(+)	Difference % + or -
I	Civil Works				
A	Headrace Canal	288,408,858.23	390,625,938.17	(102,217,079.94)	(35.44)
B	Aqueduct	4,079,250.28	-	4,079,250.28	100.00
C	Desilting Basin	123,256,478.74	146,059,516.69	(22,803,037.95)	(18.50)
D	Forebay	50,540,391.30	85,257,446.84	(34,717,055.54)	(68.69)
E	Head Works	202,722,829.36	241,195,230.59	(38,472,401.23)	(18.98)
F	Penstock Pipe Line	25,514,236.16	77,453,657.80	(51,939,421.64)	(203.57)
G	Power House/ Switch Yard	96,918,964.59	146,763,874.55	(49,844,909.96)	(51.43)
H	Tail Race	78,548,089.07	40,468,230.54	38,079,858.53	48.48
I	Intake Chamber	10,036,317.10	23,653,544.20	(13,617,227.10)	(135.68)
J	Spillway/Gravel Trap	24,017,989.23	28,227,381.92	(4,209,392.69)	(17.53)
K	Spillway / Approach Culvert	20,724,661.84	17,866,132.81	2,858,529.03	13.79
L	Miscellaneous Item	12,995,000.00	13,379,200.00	(384,200.00)	(2.96)
K	Contingencies (5%)	46,888,153.30	46,888,153.30	-	-
	Total Civil Works	**984,651,219.21**	**1,257,838,307.41**	**(273,187,088.20)**	**(27.74)**
II	Hydro Mechanical Works	19,458,600.00	43,318,947.20	(23,860,347.20)	(122.62)
III	Electro Mechanical Works	288,165,937.50	234,150,800.00	54,015,137.50	18.74
IV	Transmission Lines Sub Stat.	83,307,131.25	66,281,069.70	17,026,061.55	20.44
V	Land and Land Development	59,107,000.00	86,600,117.00	(27,493,117.00)	(46.51)
VI	Pre-operating Expenses	35,708,000.00	54,732,187.00	(19,024,187.00)	(53.28)
VII	Interest During Construction	170,665,000.00	144,675,543.00	25,989,457.00	15.23
VIII	Project Management Cost		64,325,479.00	(64,325,479.00)	100.00
IX	Current assets (Stocks, Deposits, Others)		5,500,000.00	(5,500,000.00)	100.00
	Total Cost	**1,641,062,887.96**	**1,957,422,450.30**	**(316,359,562.34)**	**(19.28)**

Source: Financial progressive report March 2012

The above table reveals the fact that the overall revised total cost of the project is going to be increased by 19.28%. The major reason behind the cost increment is increment in the civil cost of the project. The data for the civil cost has been obtained from the engineers and they claimed that due to change in quantities and rate the cost has been increased. The main reason is that the project was estimated to use the blasting material but due to security problem the project could not use the blasting materials and hence used breaker for hard rock excavation.

Moreover the increment in the cost of hydro mechanical component is that previously it was planned to use single lane penstock but now the project has used double lane penstock. Similarly the cost of Hot Rolled steel plates is high during its procurement and the cost of hoisting system has been totally excluded while making budget.

Similarly, the cost of land has also been increased. Since, the land is getting expensive day by day. The land which was procured at Rs. 50,000 per anna is now about to Rs. 400,000 per anna. This is the main reason for cost increment.

Pre operating expenses has also exceeded the budget. As per the developer of the project, the projection of pre operating cost was an error. It must be projected at near to 8% of the project but it only consist of 2.175% of the total cost

Another major lacking of the budget is that the cost of current assets and project management has totally been excluded in the financial projection of the project.

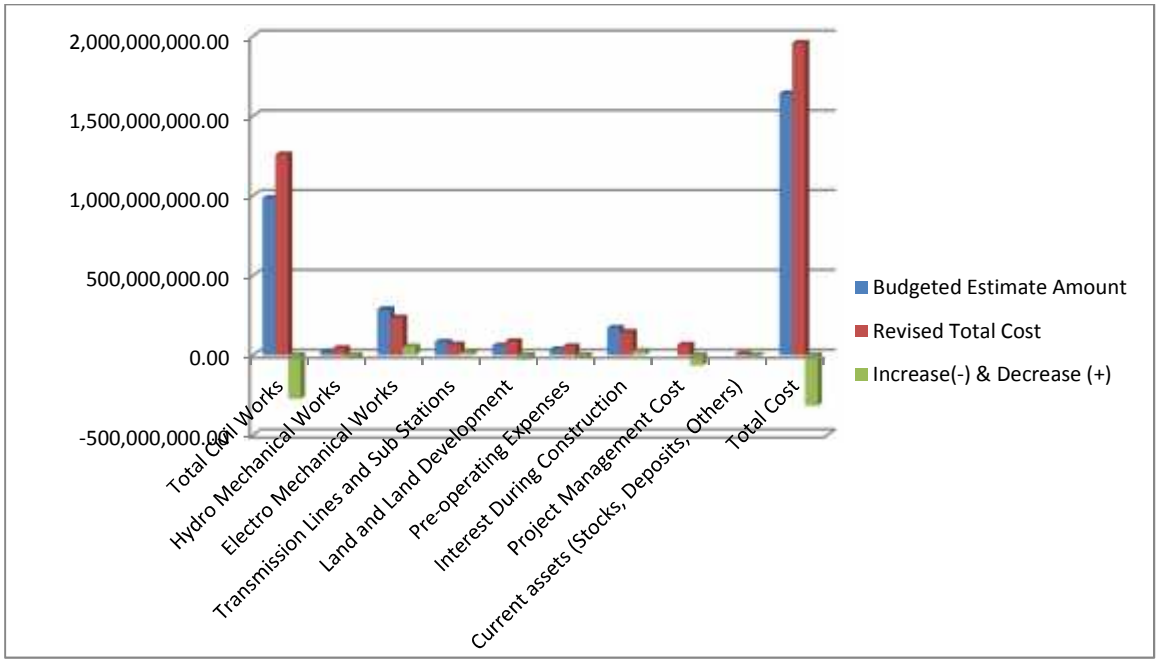
Despite of contingencies of 5%, the cost is about to exceed the original budget by 19.28%. In order to meet with cost escalation, 5% contingencies of the total cost have been estimated. However, 5% contingencies seem to be inadequate upon analysis of above table. In cost engineering and project management usage, escalation and cost contingency are both considered risk funds that should be included in project estimates and budgets. When escalation is minimal, it is

sometimes estimated together with contingency. However, this is not a best practice, particularly when escalation is significant (John K. Hollmann; lArry R. Dysert, 2007 AACE International Transactions, AACE International, Morgantown, WV, 2007). Since, the contingencies have been provisioned in the original budget, it is inadequate to address the real cost escalation.

Above, table can be shown in diagram as follows:

Figure 4.3

Estimated Total Cost of the Project



Source: Table 4.4

4.2.5 Critical Analysis on the Financial Assessment of the Project

- **Total Cost of Project:** As per the financial assessment of the project, the total cost of the project is Rs.171 crore however; the loan agreement with the bank is made mentioning that the cost is Rs.164 crore only. So, difference of seven crore has been found during the financial assessment when compared with the BOQ of the project.

- **Land for budget:** The financial assessment of the project has shown Rs. 6.1 crore under land but the BOQ has mentioned Rs.5.9 crore only.

- **Interest Rate on Debt:** The financial assessment has been made on the assumption that the interest rate is 9% on debt. However, the loan agreement with the bank has been made at the rate of 11%. Currently, the interest has reached to 14%. So, the market projection has not been adequately made regarding cost of debt.

- **Weighted Cost of Capital:** Weighted Cost of capital is equal to the after tax cost of debt times its proportion in the optimal capital structure, plus the cost of common equity times in the optimal capital structure (Corporate Financial Management, Shilu Manandhar Bajracharya/ Rabindra Bhattarai).

Weighted cost of capital at the time of analysis is as follows:

Cost of debt	= 9%
Cost of capital	= 17.66%
Debt equity ratio	=3:1
Weighted cost of capital	=9*0.75+17.66*0.25
	=11.16%

Currently the weighted cost of capital is computed as below:

Cost of Debt	=14%
Cost of capital	=17.66%
Weighted cost of capital	= 14*0.75+17.66*0.25
	=14.92%

Hence, there is increment in weighted cost of capital by 3.76% due to increment in cost of debt.

4.2.6 Projected profit of the project for 5 years

The projected profit of the project for the first five years has been shown as below:

Table 4.5

Projected Profit of the Project

(Rs. in 000)

Year	**1**	**2**	**3**	**4**	**5**
Average Capacity Utilization	**100%**	**100%**	**100%**	**100%**	**100%**
1. Gross Revenue	**233,504**	**284,210**	**292,488**	**300,766**	**309,044**
2. Less: Royalty	5,670	6,684	6,850	7,015	7,181
Royalty On Capacity	1,000	1,000	1,000	1,000	1,000
Royalty On Revenue	4,670	5,684	5,850	6,015	6,181
3. Net Revenue (1-2)	**227,834**	**277,526**	**285,638**	**293,751**	**301,863**
4. Operating Costs	33,241	33,960	34,702	35,465	36,252
5. Operating Profit (1-2)	194,593	243,566	250,936	258,286	265,611
6. Promotion Exp.	1,168	1,421	1,462	1,504	1,545
7. Depreciation & Amortization	52,830	52,830	54,064	53,723	53,478
8. Profit Before Interest & Tax	140,595	**189,315**	**195,410**	**203,059**	**210,588**
9. Financial Costs	137,347	125,969	109,618	93,266	78,224
10. Profit Bef. Bonus (8-9)	3,248	**63,346**	**85,792**	**109,793**	**132,364**
11. Staff Bonus (@ 2 %)	65	1,267	1,716	2,196	2,647
12. Profit Before Tax (10-11)	**3,183**	**62,079**	**84,076**	**107,597**	**129,717**
13. Tax (As Per Calculation)	0	0	0	0	0
14. Profit After Tax	**3,183**	**62,079**	**84,076**	**107,597**	**129,717**
15. Retained Earnings of Earlier Year (S)		3,183	65,262	128,428	194,203
16. Dividends			20,911	41,822	62,733
17. Accumulated Earnings	**3,183**	**65,262**	**128,428**	**194,203**	**261,186**
18. Percentage of Dividend (%)	-	-	5	10	15

(Project Feasibility Report 2012)

On the perusal of above table, the projected financial performance of the project is very good. The project is expected to generate the profit from the first year of its

operation. The return to the shareholders as dividend is expected to be distributed from third years of its operation.

Currently, Nepal Government has announced tax holiday for 10 years for the hydropower project from the commercial date of operation, hence no tax has been considered.

The gross revenue shows the increasing trend since; there is 3% increment in each year in the rate of revenue as per PPA.

4.3 Analysis of Primary Data

The primary data were collected from the personal interview and structured questionnaire method. Two type of separate questionnaire were designed for hydropower developer and financing institutions. In order to collect the detail information in the field of financing of hydropower projects and the researcher has carryout the interview with experts and professional in the financing of hydropower projects to collect the opinion and views. Analysis of data and information collected through the questionnaire and interview method has been analyzed as under.

4.3.1 Analysis of Interview with the Experts and Professionals

Opinion survey was done through personal interview with professional and experts of the hydropower developers of the project and financing institutions. The result of this Interview has been tabulated as under. The finding and opinion of the individual were included in the recommendations. The detail about the interview is in the following tables.

Thirty persons were interviewed in the field of financing, hydropower developer and businessman in Nepal. Among them twenty were hydropower developers and ten were financer of the various institutions. Twenty-one of them have given very

useful information regarding the financing but nine of the interviews were useful to understand the market situation, economics of hydropower industry and other general information in Nepalese hydropower industry. The information and data observed during the interview are listed in the following table.

Table 4.6

Opinion Survey / Interview with Experts and Professional

Discussion Topics	Respondent	Response in %
Government Policy	Officer, Layers of Bank and financial Institutions	Favorable- 60% Unknown-10% Unfavorable-30%
Financer Attitude	Chief executive and officers	Positive-90% Negative-10%
General Concept	Assistant level employee	Known -70% Unknown- 30%
Present Status	Scholars, and officers	Unfavorable- 80%, favorable-10% Worst-10%
Future aspects	Businessman	Bright- 50%, Unattractive -30%, Neutral-20%
Foreign Financing	NGO and INGO and other support institution's employee	Attractive but a lot of improvement to be made and slow and corrupted government employee – all
Current Problems	Businessman	Insurgency situation and negligence of government employee - all
Improvement to be made	Businessman	Policy and Legislation amendment, improvement of present insurgency situation and improvement on service provide by the government employee- all

Among the thirty persons in the field of financing and development of hydropower project in Nepal, a large numbers of people have given very useful information regarding the financing. They provide not only the precise information and experience in the field of financing but also some of the information about the

market situation, economics of hydropower industry and other general information in Nepalese hydropower economic and industry.

Regarding the government policy and legislation on hydropower sector in Nepal, the respondent were optimistic and they found it favorable policy for which financer and investors should attempt to grab the opportunity.

Local Financing institutions are interested to provide loan with some collateral, as there is high risk of time of payback. The general view and concept of financing in the hydropower sector was also found satisfactory. Most of the respondents were aware of the fact and opportunity of hydropower sector in Nepal. Regarding the concern about the financing through foreign investor or government were found to be attractive but need to improve on providing governmental service to them.

The intellectual and experts were asked about the current problems in the country for the investment in the hydropower sector, the responded that the situation might be improved. Beside that problem government and their employee should be honest to develop the nation, which automatically win the current problem.

Above survey reflects the overall situation of hydropower development in our country.

4.3.2 Analysis of Responses of Hydro Power Developers

The structured questionnaires were asked to ten promoters of the project. The responses were summarized and tabulated as under.

1. Is 164 crore is Adequate Budget for Your Project

The responses were as under in the table 4.7

Table 4.7

Adequacy of Budget

Total Respondent	Yes	No
10	10	-

Above table clearly shows that 164 crore is adequate for 10MW project. All of the promoters are confident on the adequacy of the project.

2. Is Budget Allocated for Land is Adequate?

The response were as under in the table 4.8

Table 4.8

Budget for Land

Total Respondent	Yes	No
10	3	7

The above table shows that 7 respondents show that the budget allocated for land is inadequate and rest 3 respondents show that the budget allocated for land is adequate.

3. Is Budget Allocated for Pre Operating Expenses is Adequate?

The responses were as under in the table 4.9

Table 4.9

Budget for Pre Operating Expenses

Total Respondent	Yes	No
10	2	7

Out of ten, 2 respondents of the developers say that the budget allocated for pre operating expenses is adequate and rest 8 respondents say that the budget allocated for pre operating expenses is inadequate.

4. Omission of Project Management Cost and Current Assets in the Total Budget?

The responses were as under in table 4.10

Table 4.10

Budget for Project Management Cost and Current Assets

Total Respondent	Mistake
10	10

It has been observed that all of the ten developers agree that omission of project management cost and current assets in the total budget was mistake.

5. What are the Main Problems in Hydropower Development?

The response given by ten respondents have been summarized as under.

1. No concept of project financing
2. Personal guarantee required
3. No large fund available with single bank
4. Difficult to arrange consortium of banks and their coordination.
5. LFIs charge higher premium for the risks.
6. No confidence over the developers.
7. Main problem of arranging the 30-40% equity part.
8. There is no successfully run hydropower projects, most of the projects are under study and a few are under construction.
9. Political instability in the country and crisis of trust on the government policy also.
10. Question of lenders on the payment of PPA amount for the developers by NEA.

11. No sufficient core capital in the development/commercial banks to finance capital intensive Projects like hydropower honor the NRB guideline.
12. Not availability of technical personnel in the financing institutes to understand the project parameters.
13. Economic crisis

6. What Improvement Local Financial Institution should made in their Policy of Lending, Especially for the Hydropower Development Project?

The response given by ten respondents have been summarized as under.

1. Project financing should be accepted fully by Financing Institution.
2. Financing Institutions should have technical expertise to appraise the project.
3. The lead bank must do the coordination and convincing to other consortium partners.
4. Financing Institution should relax in the current interest they charges on lending in the hydropower sector and also remove the other financial and non-financial charges.
5. Local Financing Institution should have expertise to monitor the project progress invoices and physical progress.
6. Establishment a bank exclusive to finance the project investment (clean energy bank) like hydropower projects.
7. Establishment of power development fund to finance hydropower projects.
8. Venture capital concept for project study and investigation should come to the financing sector.

After the analysis of the questionnaire filled by the Hydropower Developer, the following gist points have been extracted:

Total budget of 164 crore is adequate for the project as well as the project can be managed within the stipulated cost though there is excess cost in land and pre operating cost. The omission of project management cost and current assets was a blunder.

At present, the main problem of the developers is the arranging equity, therefore, developers always like to have high debt equity ratio. In the other hand in project financing the lender always like to have smaller ratio.

4.3.3 Analysis of Responses of Local Financial Institutions

Since the project has been financed by eight local banks and financial institutions. A set of questionnaire has also been designed. Since the bankers are so busy, the researcher has tried to collect their views through telephonic conversation as well. Only five questions have been asked to them and have been summarized below:

1. Is the cost of Rs. 164 crore is Adequate for the Project

Table 4.11

Budget Adequacy

Respondent	Result
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes

All of the bankers show the same view that the cost of Rs. 164 crore is adequate for the project construction and they further expressed the view that any over run in the cost shall be borne by the shareholders

2. Is inter head adjustment in the Budget is Possible?

Table 4.12

Inter head Adjustment in Budget

Respondent	Result
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes

All of the bankers expressed their view that the inter head adjustment in the budget can be made in the condition that the total funding of the project is within 125 crore that is within the funding portion of the bank. Moreover, they expressed their views that the inter head adjustment can only be made at the end of the project.

3. Are you Interested Investing in Hydropower Projects?

The responses were as under in table 4.13

Table 4.13

Investment in Hydropower Project

Total Respondent	Yes	No	Watch and See
10	6	2	2

It is found that six respondents out of ten are interested to finance hydropower project but due to lack of experience in this new sector they want to go with small exposure. Two of them want to wait and see or learn little more before they invest in hydropower. Two of them who have good clientele and quite successful in the current market in other field has not shown to explore new avenue and are not interested to invest in hydropower now.

4. What are the major problems in hydropower projects?

The responses were as under in table 4.14

Table 4.14

Problems in Hydropower Project

S. No.	Problems	No of responses	% of response
1	Lack of confidence of financer on the developers	2	20
2	Large gestation period	2	10
3	Non availability of large fund	2	10
4	High risk of project completion	2	20
5	Interest rate mismatched (developer looking for low interest rate)	1	10
6	Problems of collaterals	1	10
7	No technical expertise for hydropower	1	10
8	Other problems	1	10

The above table 4.14 responses states that the main problems LFIs foresee in the investment in the hydropower project are less confidence on the developers and successful completion of the project with the design energy production. The other problems are non-availability of large fund lack of technical knowhow. Problems of collateral against the fund, lack of project appraisal experts are their problem that diverts financing institution not to invest in hydropower field in Nepal.

5. What are the improvements the hydropower developers should made in order to attract fund from the LFIs?

The following responses have been received.

1. Objective evidence of equity and put the equity first.
2. Better investigation of project in the feasibility and detail design phase.
3. Real costing of project components, do not inflate cost to cover everything from loan.

4. Few good examples of successfully run hydropower projects are required to increase confidence of lenders.
5. Commitment of the developer in form of personal guarantee.
6. Guarantee that the technical experts shown in paper are real and work for the project period.
7. Experience people should be added in the project management team.
8. Need of full and comprehensive insurance coverage for whole of the construction period and coverage for loss of profit also.

After the analysis of the response, all the bankers involved in the project expressed their views that the total budgeting of the project amounting to Rs. 164 crore is adequate for the completion of the project. As well as all of the bankers expressed their positive views regarding inter head adjustment in the budget but within 125 crore i.e. total funding from bank.

It is found that majority of the Local Financing Institutions are interested to finance hydropower project but due to lack of experience in this new sector they want to go with small exposure. Many Local Financing Institutions want to wait and see or learn little more before they expose themselves to hydropower. Minority who have good clientele and quite successful in the current market has not shown to explore new avenue and are not interested to invest in hydropower now.

The main problems Local Financing Institutions foresee in the investment in the hydropower project are less confidence on the developers and successful completion of the project with the design energy production. The other problems are non-availability of large fund lack of technical knowledge.

4.4 Major Findings

From the analysis on secondary as well as primary data collected through structured questionnaire and interview with the experts & professional people of hydropower project, the following major findings of the study have been drawn.

1. Application of the Financial Projection of the Project

The main finding of the project is that the financial projection of the project has not been completely complied with. The financial projection of the project shows the total cost of Rs. 171 crore where as the total cost of the project of Rs. 164 crore has been considered.

Moreover, the budget in the land has also been stated lower than mentioned in the financial projection of the project.

Financial projection has been made on the assumption that the interest on debt is 9% only but the scenario has been completely changed and the interest on debt in current market is 14%. Hence, the adequate exercise on the projection has not been made. Projection of market rate of interest has not been made.

2. Adequacy of Budget

Both the developer of the project and bankers of the project have presented the consensus view that the budgeted cost of Rs. 164 crore is adequate for the project. Though there is excess cost in some of the budget heads such as land, pre operating expenses, hydro mechanical works, the project can be managed within 164 crore.

On the contrary, on the analysis of the estimated project cost under secondary data, the cost of the project is going to be increased by 19.28%.

So, contrast views have been found while obtaining the secondary and primary data. Primary data reveals that the project is manageable within the budgeted amount of 164 crore where as secondary data reveals that the cost of the project is going to increase by 19.28%.

The researcher has a concluding remark that though the primary data reveals that the project is manageable within the estimated budgeted, the cost overrun is possible and cannot be ignored in this project and must be accepted by both the developers and bankers.

3. **Inadequate Budget Projection of Pre Operating Expenses, Land and Hydro Mechanical Works**

On the analysis of the secondary data, budget for pre operating expenses, land and hydro mechanical works have been projected inadequately resulting excess of actual figure over budgeted one. Budget of land is inadequate by 22.12%. Similarly, there is inadequate budget for pre operating expenses by 3.24%. Hydro mechanical works have also exceeded the budget by 26.61%.

Moreover, on the analysis of the primary data, all the respondents have presented their consensus view that pre operating expenses, land and hydro mechanical have been inadequately projected.

The researcher has concluding remark that the inadequate projection of the sub head of the project should be timely corrected in order to save the cost overrun. Such inadequate projection shall be timely rectified so that its impact can be reduced so that the project can be completed within stipulated time frame and budget.

4. **Omission of Project Management Cost and Current Assets in the Budget**

On the analysis of the primary and secondary data, budget for project management and current assets have not been allocated.

Moreover, omission of budgeting of the important items in the project makes project a hurdle and may not be manageable within the estimated budget.

The researcher has concluding remark that while forecasting the cost of the project, great attention is to be given on all the items so that it can be ensured that all the items are incorporated. Opinions of experts are to be taken into consideration while making financial projection of the project.

5. Problems of Hydropower Projects in Nepal

a. Problem in Sale of Electricity

It is observed that Nepal's electricity is expensive. The generation cost was very high and then huge loss in transmission and distribution, which again added to electricity tariff thus Nepalese electricity, is one of the expensive in the region. Due to the high tariff of electricity and low per capita income it is very difficult to increase the domestic consumption of electricity substantially to the existing customers, it is because the substitution of electricity in cooking is not economically feasible in large scale. The expansion of electricity is needed but the current statistics show that approx 85% of the load is domestic load, long transmission and huge distribution cost, which make the domestic expansion not economically viable to NEA. This limits the expansion of domestic market.

The analysis showed that Nepal's average tariff to the consumers was almost double of that of India. Main reason was that Nepal's tariffs are not subsidized while those of India are heavily subsidized. As a result, Nepal's electricity utility is a profit-making organization generating even some internal funds for investment in power system expansion while almost all of India's electricity

utilities are running into loss. Agriculture tariff in India is abysmally low while its share is about 30% of the total electricity consumption. The largest consumer, industry with about 34% of the total electricity consumption, is heavily charged. It again highlighted the urgent necessity for tariff reform in India. Unless this reform takes place no substantial investment will come forward in power sector and hence, **Nepal's hydroelectricity is too expensive to be exported to India**. In addition, the volumes available from individual plants appear to be uneconomic to export from Nepal on a plant-by-plant basis. It appeared reasonable for Nepal to consider exporting larger blocks of hydropower through some mechanism that aggregates the exportable volume, and to sell this as mid- and peaking power.

b. Socio-Political Problem of the Country

Nepal has been facing a lot of socio-political problems since 1990 when multiparty system is introduced in the country. Though the country is opened for the liberalized polices and fronts for the investment to rest of the world. But, due to the frequent changes in government and so the policies the objective is not fulfilled. Due to political instability, the investors had no favorable atmosphere for investment in Nepal.

Inverse political situation prevailing during last decade has severe negative effect in the direction of investment in infrastructure project.

c. Problem of Genuine Developers

When hydropower generation was opened to private parties in around 1996-97, a whim has started to capture more and more license for development of hydropower projects. The people, who were having some knowledge that this industry has future, were the ones to opt for it.

In the first phase, people who had some know how of hydropower and its future were the one to take licenses who had some knowledge only but no other resources. They had even lacked resources for the pre-feasibility of the Project. They just were having vision that one day the license will lay the golden eggs. The researcher has found that a few had already made their dream come true and some in the process.

In the second phase some of the people politically affiliated captured few license, the politician having money to an extent but not know how. They opted the license to give good impression to their voters that he/she going to develop electricity to their voters but not sure when this going to be happen.

In the third phase some entrepreneurs or business people who can arrange resource came to the seen. But by then the most of the economically viable projects are booked and they left with the project far from the motor able road and national grid, which made the project difficult to construct and less attractive in economic terms.

Thus only few so-called developers who has captured license were really capable for developing projects. These developers, who had struggled to arrange finance and to construct the project to make the project successful, are the one who are genuine developers.

d. Equity Arrangement is the Main Problem of the Developers

Hydropower generation project are capital intensive, need all the capital at the beginning or during construction, take long to pay back and is full of risks. The capital requirement in the hydropower project is to an extent is site specific also, because according to the site conditions the construction cost of the same amount of energy may substantially cost more. On an average the generation cost on current price level is NRs. 100-120 millions per MW.

Since the hydropower projects are constructed under the concept of 'project finance' in which the equity put by the developer is in real sense the guarantee for the lender, that the project is going to be there and will generate the revenue as it has been planned. Therefore, the first phase of financing of the hydropower project comes to the end of the developers. The developers have to finance the project from the beginning i.e. from the time of feasibility study, detail design, power purchase agreement and all the works for the financial closure. In the non-recourse financing like project financing the lenders always want the borrower should put as much as possible. The currently minimum for in equity/ debt 30:70. The 30% equity arrangement is the biggest problem for the developers.

e. Unstable Government Policies

As discussed above in overall country scenario, the governments are short lived so their policies, Due to the short sightedness of the political parties and their leader, long-term development vision of any sector cannot come forth. It happened to be the same to the hydropower sector; different development policies and strategies have been tried in this sector. Government has ended expensive learning in some cases. Due to the lack of detail analysis and experiences the polices and regulation made by the government changes now than then. This kind of frequent change in the policies looses confidences of the investor in hydropower industry.

6. Lack of Co-ordination between different Government Departments and Ministries

The development of the hydropower project involves a numbers of government ministries and departments. There is no clear-cut coordination between the different ministries even the level of information flow and integrated approach to support one main policy. The Ministry of Water Resources (MOWR) come

with the developer friendly policy but the Ministry of Finance MOF), Department of Taxation, customs, Nepal Rastra Bank (NRB) and Ministry of Environment (MOE) remained adamant to their general rules which does not solve the problems. Therefore, if a sector is given a priority in development all the concerned ministries and department should sit together and work a single window policy for that sector so that there will not be a problem at the time of execution in the long term.

7. Less Priority of Local Financing Institutions toward the Hydropower Development Sector

When it comes to the financing of the hydropower sector it needs to involve the Developers and LFIs. Developing a new sector like hydro is not the burden of developers only; the LFIs also should work hard to develop this sector for the future investment opportunities. The current situation of high liquidity in the economy is due to lack of proper investment opportunities the LFIs are continuously decreasing the interest rates on the deposits. Therefore, the LFIs should also come forward to help the genuine developers and work together to make the win win situation for both. The current lending policies of the LFIs are one sided, the developers are accepting the conditions of the lenders but one-sided policies cannot last long.

8. Lack of Consortium Financing

After studying the capital composition of local commercial and developing banks, except few commercial banks, rest have very limited core capital. Most of the money available with the commercial banks is the short-term deposit from public. Therefore, there is the mismatch in cash flow of the banks. In the other hand, even if the core capital is available with the bank the bank does not want to exposed heavily to one industry and to one project or borrower, there needs to be balance of portfolios of lending. Nepal Rastra Bank (NRB) has also

made the guideline on the exposure limit to a single borrower. All these factors lead to the need of consortium financing to the hydropower projects. The consortium concept itself is not matured in the Nepalese finance industry. There is a great need to take initiatives by banks to flourish the concept of consortium financing. The formation of consortium and its management should be the task of banks rather than that of developer, which is in the current practice. Since the lead partner charges the fee to manage the consortium, it should do the administration, management work and also arrange the consultancy of technical experts for monitoring of project progress.

9. Issue of Personal Guarantee in Project Financing Concepts

It is found that LFIs have reservation in practicing the project-financing concept, this is the situation of lack of confidence on the developers' facts and figure. LFIs doubt on the first place on project costing and secondly on the objectivity of the equity developer puts in, the result of which lender asks the personal guarantee of promoters board members. But, the future of developing and lending will be only successful if the rules of the project financing are honor from both the parties

10. Lack of an Independent Body for Technical Consultancies in Hydropower Project

There is great need of an independent team of consultants which comprises of the technical experts available in country as the center of excellence which can imparts practical input or to the point advice to the developers and lenders as an when they required. This independent body should work on fee basis and should provide the consultancy with some accountability. This body at the beginning should start from the grant fund available with donor or government to provide the cheaper consultancy to lender to understand the developer technical proposal. This mechanism will help lenders to make quick decision

on lending. As time of construction of the project is the prime factor, the delay is deciding or reimbursing fund by banks will be very critical to the developer.

11. Lack of coordination with INGOs and NGOs to the real Developers

It is found that a reasonably large sum of money is spent in the country by different INGOs and NGOs in hydro and alternative energy sector. Some of them are specially spending time and money to develop hydropower sector but most of the activities carried away by these organizations are in repetitive in nature or same and mostly in the micro hydro. There is acute need to channelize these funds in developing the small hydropower projects, especially in investigation, financing and technical consultancies.

The investigation of the hydropower project need large amount of money if the project became infeasible at end of study then the investment is a waste. Therefore, this job of detail feasibility should be done from the government fund or grant so that there is fair judgment of the parameter of the project. It is very difficult in the developing industry like hydro in Nepal for the entrepreneurs to risk their capital without the return. MOWR should co-ordinate the activities and the project study should be carried away in a genuine manner. The argument here is that feasible projects should be available for the developer without any confusion so that they will put their money in the project (but the developers must verify the fact before actually developing it). At present the developers are asked to find the site do the study and develop it, once developer but large money in the study and investigation there could be a tendency to make the project feasible by force, which later create a spiral effect of problems to all the stakeholders.

12. Regulation for the Licensing of the Project

Currently the project development licenses are issued in two phases. First phase is the feasibility study license, which is only for the investigation and study. In the second phase a project construction or the development license. The construction license is subjected with conditions that, the developer should carry away the PPA and financial closure within 12-18 months time, otherwise the license is withdrawn in principle but this is not done in real practice.

Since license is the ultimate authorization to the developer to develop the nation's hydro resource the license issuing authority should be very serious to investigate the seriousness and resource base of the license holder. Stricter regulation for the issuance and monitoring the developer is of utmost important to find out the real developers. Currently, a person or group of people have captured a numbers of licenses with minimum pain and behave like a mini nation to sell the rivers and water resources of a nation to Nepalese or foreign buyer. Trading of the developing license should be strictly banned by regulation. Otherwise, it is not strange to sell thing, which earn profit in this age.

13. Objective Evidence of Equity

One of the problems raised by LFIs about the developer is the issue of the equity they suppose to put in the project. The main concern is that many of the developers inflate the cost they spent in bringing the project to the stage to borrow money from the lenders. The prices of the assets e.g. land; building and administrative expenses are inflated to match the equity part. Many a times the lender doubt the costs, this create a situation of lack of confidence on the part of the lenders. Secondly the equity portion should be raised first and shown on the tangible firm to gain the confidence of the lenders, this in fact help

developers to get a cheaper loan, this is because the lender will reduce the risk premium as they get confidence on the developers.

14. Real Costing of Project Components by Developer

It has been learnt from some of the lenders and also from developers that due to the problem of equity arrangement or with bad intension on the developers are that they inflate the cost of the components of the project in such a way that they will cover the project expenses with the portion of the loan. Some time they save some money from the debt and use it to some other business also. This culture and some evidences have warned the lenders not to believe the developer on face value. One or two developers might have done it, which has created bad name in the lenders market, which in turn creating trouble to the developers itself.

The hydropower industry is in the developing stage, in the past government has developed the hydropower projects on the grant and the soft loan. In such project the financing and economics was not the primary concern these project were built on the priority of supply electricity to the important market centers. Now a couple of projects are developed for the commercial purposes considering all the costs and benefits. The performances of these projects, if fulfilled the design technical and financial parameter will bring a good message to both developers and lenders. But if the examples perform badly them it may bring the bad message also. Therefore, most of the lenders had expressed their opinion to wait and see the example or exposed a little to learn lesson.

In this situation the example setter must work hard to bring the good news to the one of the most important sector of the Nepalese economy.

15. Commitment and Capability of the Developer

The Nepalese industrial culture set by entrepreneurs to the lender is not very popular. The LFIs has already experienced bitter experiences from different sector on project financing, where using various tricks borrowers have cheated banks. A typical example is entrepreneurs inflating costs of the project and getting it financed from the bank using the loan in other personal properties and later abandoning the project in the mid or if completed also the project will not generate the cash flow to service the debt. In such situations, banks started to ask for the personal guarantee of the developers even in the project financing also, which from the viewpoint of the developer is not fair but from the lenders angle it is okay because it is just as an indicator of commitment of the developer and his confidence on his project. In principle, the system of unlimited liability to the developer is not good but it can be justified when the morale and faith is in crisis. In the whole story, the staffs of the LFIs are equal partners in sharing the blame by selling them for the personal benefits.

The attractiveness of the project and the availability of resource are important but more important is the team that is entrusted to use it efficiently and effectively. If the team is well organized and experienced the chances will be more that things will happen the way it is planned in the other hand it may easily happened in the other way. Therefore, in the present situation due to the short supply of experienced technicians and mangers this issue can became important. The human capital and its commitment to complete project on time and to the quality is the one area most of the developers and lenders do not well valued, due to which unseen problems will come later which demand time and money to correct them. Proven experience in similar responsibilities and hands on skills are the true qualities to be considered of the team members.

Due to the problems of equity collection, a large numbers of people comes in the lists of the developers which later difficult to manage, a clash may come in between the developers which can lead to a serious problem in the project development.

16. Full and Comprehensive Insurance Coverage for Whole Project

Financing a hydropower project is very heavily dependent on prudent management of risk. This involves identification of various risks associated with a project and assessment thereof. However, the most important step lies in arranging measures to mitigate such risks, including an effective insurance program. Nowadays insurance is available to the every extent, even in the hydropower the insurance cover is available for full comprehensive coverage. The cost of insurance is the issue to the poor developer, who is the one going to get the burden. Since the hydropower projects are full of varieties of risks so it is better to pay some now and secure the future to an extent. The full coverage increases the confidence level of the lenders.

17. Government Equity Participation

One of the main problems of the developer is the arrangement of the equity portion, as the private hydropower generation in Nepal is in the very early stage, therefore, the government should encourage the sector. In order to establish the confidence of the other investor government should also participate as a minor partner in the genuine developer's project. This involvement of government will help to attract more entrepreneurs. This investment is required only in the beginning after certain time when the hydropower development industry gets established it will attract investors.

CHAPTER – V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

On the basis of above analysis, the researcher has been able to summaries the outcome and finding in course of study in the field of financial assessment of hydropower project. The whole study carried out has been summarized below.

5.1 Summary

This study has been carried out to ascertain the practical application of the financial assessment of LM1HPP. This research is based on the historical data obtained from the project and the primary data collected by the researcher.

In the first chapter, general background of LM1HPP, statement of problem, objective of the study, significance and importance of the study, limitation of the study, and organization of chapters have been dealt. Therefore, this chapter highlights the basic aims and structure of the study.

The second chapter reviewed the existing literature in the field of hydropower. This chapter has also dealt with the various laws regarding the development and control of hydropower project. This chapter has also reviewed the existing studies undertaken, thesis and journals.

Third chapter has briefly explained about the research methodology, which is used to evaluate the financial assessment of LM1HPP. This chapter has dealt about the research design, types and sources of data, method of analysis, tools for analysis and method of presentation and analysis.

Forth chapter has dealt with analysis and presentation of primary data and secondary data. The data has been analyzed from various angles to meet the objectives of research. Diagrammatic analysis of data as well as well tabulation of

data has been carried out under this chapter in order to meet the prime objective of the research.

Fifth chapter deals with the major findings of the research work on the basis of analysis made on previous chapter**.**

5.2 Conclusions

From the analysis on secondary as well as primary data collected through structured questionnaire and interview with the experts & professional people of hydropower project, the researcher has the following concluding remarks:

- The financial projection of LM1HPP has not been practically applied. The financial projection of the project shows the total cost of Rs. 171 crore where as the total cost of the project has been considered as Rs. 164 crore while making agreement with the banks. The reason behind this is to make the project cost attractive to the financial partners.
- Total cost of the project is going to be exceeded by 19.28%. The original cost of Rs. 164 crore is inadequate for the completion of the project. Due to lack of adequate financial evaluation, the cost of the project is going to increase by 19.28%
- Civil cost of the project is likely to exceed the budget by 27.74%. The main reason behind the cost increment in civil work is that there is no sufficient feasibility study of geological condition of the project.
- Budget allocated in the financial projection for budget head land is inadequate. The financial projection has allocated total budget of Rs. 59,107,000.00. However, it requires around Rs. 86,600,117.00 for land till the completion of the project. Hence, the budget deficit under budget head land is 46.51%. The main reason behind this that the financial assessment has not considered the

increasing trend of market value of land as well as landowners also demand for higher price for their land.

- Budget allocated for budget head pre-operating expenses is inadequate. Budget over run under this head is carried out to be 53.28%. No adequate financial assessment has been made under pre operating expenses
- No budget has been allocated for Project Management Cost and Current assets. Therefore, no adequate exercise has been made to address these costs in the financial assessment.
- Interest on debt has been taken as 9% in the financial projection. However, the company has signed the loan agreement at 11%. Currently the project is bearing interest of 14.55 on its debt. So, increasing market trend of rate of interest has totally been ignored
- In order to meet the price escalation, contingencies of 5% of the total cost of the project has been estimated. In fact contingencies of 5% seem to be inadequate to meet the current price escalation.
- Real costing of the project is to be carried out to attract the investors. However, the project has been made attractive by curtailing the costs which are to be beard compulsorily for the completion of the project.

5.3 Recommendations

The primary concern of this study is to look the financial projection of the said project; and to suggest them on the basis of finding. The recommendations have been separated under three heading to be specific to the group of people who are involved in the respective fields.

After the analysis of responses on questionnaires, interview with professional, review of literatures, analysis of present status of policy & legislation, analysis of problems of hydropower developers & financing institution, observation of

shortcoming in the policy and study of financing status of other neighboring country, the researcher has formulated the following recommendation to the concerned authorities on the basis of analysis and discussion for successful completion of the project.

A. Recommendations to the Developers of the Project

1. Financial projection of the project is to be adequately done so that the budget allocated for every item is sufficient. Since, cost overrun in the project cannot be ignored; a little variance can be accepted but the great variance when compared to the budgeted one can not be accepted. Moreover, adequate exercise is required for the financial projection and the projection should be completely complied.
2. Omission of important cost element in the financial assessment of the project shall be totally discouraged. Views of experts shall be taken into consideration while making financial projection of the project.
3. Real costing of project components, do not bear the cost to cover everything from loan. It is therefore few good examples of successfully run hydropower projects are required to increase confidence of lenders. Objective evidence of equity and put the equity first in order to attract the financing institutions.
4. Commitment of the developer in form of personal guarantee is highly essential. Guarantee that the technical experts shown in paper are real and work for the project period. Better investigation of project in the feasibility and detail design phase.

B. Recommendations to the Financing Institutions

1. Local Financing Institutions are advised to work on the project financial assessment concepts. As the hydropower projection cannot be done on the hypothesis basis. LFIs must practice the concept of Project financial

assessment in true sense. Since the hydropower projects are capital intensive and the whole capital is needed during construction stage. A huge fund is required; unless the entire fund required is injected the revenue cannot inflow. In general, it is an impossible task to construct a hydropower project on pure equity finance. A proper blend of debt and equity is required. Thus, both the parties should follow the rule of the game of the project financial assessment to benefits from the situation.

2. Local Financing Institutions and developers are working separately-they must work together and establish the center of excellence of experts of different technical and financial back grimed.
3. Project financial assessment should be accepted fully by Financing Institution. Financing Institutions should have technical expertise to appraise the project that reduces risk of payback. There is a need to establish of power development fund to finance hydropower projects. As well as cost overrun shall be accepted up to certain limit.
4. Project financing must be done through the consortium of financing institutions. The lead bank must do the co ordination and convincing to other consortium partners.
5. Financing Institution should relax in the current interest they charges on lending in the hydropower sector and also remove the other financial and non-financial charges.

C. Recommendation to the Government

1. Role of INGOs and NGOs should be co-ordinate for the real developers. The project investigation and feasibility analysis should be done from the government budget or and from the grant assistance of the INGOs and NGOs. If developers do the investigation there could be the tendency of making project feasible without of necessary investigations.

2. There should be strict regulation for the licensing of the project and the potential developer must be evaluated for the ability to arrange finance for the project. The license should be strictly monitored for the duration on which the developer must accomplish his responsibilities; otherwise the project is made available for other interested developers.

3. Government's hydropower development policies should be reliable, coordinate to all related department and attractive to the potential investors. As one of the stakeholders, the Government of Nepal has been found to be supportive in the opening of the hydropower sector for the development of the private sector. GoN has been promulgating the policies favorable to private developers, but in the developer's eyes the policies are still need to be refined and most important is the stability of the policies i.e. the policies should not frequently change. The change in one area creates doubt in integrity of the government in the mind of developers and investors. Second, since development of the hydropower project need co-ordination between MOWR, MOF, NEA and MOE it very important to have co-ordination between the different ministries and departments. A consolidated single window policy or co-ordinate from a single cell is required to up bring the hydropower as the priority sector. The bureaucratic (redtapism) in the various departments frustrates developers. It is found that one ministry make one policy which is confined to that ministry the other follow the general system which again does not produced desired results.

   Due to the lack of fund, time and expertise for the detail investigation at the beginning, many a times, it is found that people rush to construction and ended with big problems. It is also recommended that the government or development agencies like JICA, NORAD, GTZ, DANIDA, USAID, UNDP, World Ban and IFC should provide financial and technical assistance to

investigate the project made available to genuine developer with the minimum fee.

4. Insurance companies, Citizen Investment Trust and Employees. Provident Fund should be encouraged to invest in hydropower projects. It is found that Insurance companies have money available to invest in the reasonably long-term projects, but the currently regulation policy of insurance companies do not allow them to invest not other than in government bonds and fixed deposits of the commercial bank. A policy to give freedom to invest in the priority sector like hydropower generation can contribute in the financing problems. It is the case with the Citizen Investment Trust, the trust has the positive intention but larger exposure needs confidence in the sector because the sentiment of the depositors in the trust is to expose to minimum risk sector. There is good fund available with EPF and this institution has lent a good amount but it has further potential of lending. It is recommended that institution like EPF should develop specialization in leading a consortium and establish link with technical expertise for further advancement in this area of lending.
5. Government equity participation: One of the main problems of the developer is the arrangement of the equity portion, as the private hydropower generation in Nepal is in the very early stage, therefore, the government should encourage the sector. In order to establish the confidence of the other investor government should also participate as a minor partner in the genuine developer's project. This involvement of government will help to attract more entrepreneurs. This investment is required only in the beginning after certain time when the hydropower development industry gets established it will attract investors on its own.

At last the researcher appeals other student to go after this research and make depth study of the project and accomplish the actual cost of the project till its end.

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Annexure 2: Questionnaire

Set 1: Hydropower Developers

1. Is 164 crore is adequate budget for your project?

   Yes ☐ No ☐ Other, please specify ☐

2. Is budget allocated for land is adequate?

   Yes ☐ No ☐ Other, please specify ☐

3. Is budget allocated for pre operating expenses is adequate?

   Yes ☐ No ☐ Other, please specify ☐

4. Reasons for omission of Project Management Cost and Current Assets in the budget

5. Main problems in Hydropower Development

6. Improvements to be made by financial institutions for Hydropower Development

Set 2: Local Financial Institutions

1. Is 164 crore is adequate budget for your project?

   Yes ☐ No ☐ Other, please specify ☐

2. Interhead adjustment within the budget is possible?

   Yes ☐ No ☐ Other, please specify ☐

3. Interest in Investment in Hydropower Project

   Yes ☐ No ☐ Other, please specify ☐

4. Problems on Hydropower Project

5. Improvements to be made by Hydropower Developers