CHAPTER- I

INTRODUCTION

1.1 Define Problem

The term of capital refers to long term asset used in production, while a budget is a plan which details projected inflows and outflow during some future period. Capital budgeting is the process of planning and controlling the strategic (long term) and tactical (Short term) expenditure on fixed assets such as land and building, plants and machinery, furniture and fixtures, vehicle, major renovations and patents. Typically, capital expenditure project tied up large amount of cash, other resource and debt for the long Period.

Capital budgeting is a decision making process for an investment on fixed assets. It can be defined as the firm's decision to invest its current funds most efficiently in the long term assets in anticipation of on expected flows of benefits over a series of years. It concentrates on the allocation of scarce resources between alternative used in order to obtain best objectives.

Capital budgeting is the process of planning and controlling the strategic (long-term) and tactical (short-term) expenditure for expansion and contraction of investment in operating (fixed) asset (Welsch, Hilton and Gordon, 2006:394).

Capital budgeting as “the decision making is the process by which firms evaluate the purchase of major fixed assets including building machinery and equipment. It is also covers decision to acquire other firms either thought the purchase of their common stock or groups of assets that can be used to conduct an ongoing business” (John Hampton,1994: 299).

Capital budgeting is of paramount importance as a framework of future development, and as a major determinant of efficiency and competitive power of firm. It is relates to fixed or long-term asset, which are defined as assets that are in operation and yield returns over a period of time. It therefore, involves a current outlay in return for a series of anticipated future benefits (Khan and Jain, 2003).

The main exercise involved in capital budgeting is to relate the benefits to costs in some reasonable manner, which would be consistent with the value maximizing objectives of the business. Capital budgeting decision is the most important area of managerial decision as it involves more extended estimation and prediction of things to come requiring a high order of intellectual ability of their economic analysis. Heavy spending on capital assets since the Second World War has stimulated a genuine and lively interest on the part of the economists’ financial analysis, and accountants in managerial approaches to capital budgeting decisions (Goyal and Man Mohan, 1999).

“Capital budgeting consists in planning for development of available capital for the purpose of maximizing the long term profitability (return on investment) of the firm” (M. Lynch, 1984).

It as “Long term planning for making and financing proposed to capital outlay” (Charles T. Horngree, 2002).

On the basis of the above definitions, it can be said the capital budgeting is related to fixed assets. It is a long term planning. It is an exchange of current fund with future benefits and benefits will occurs over a series of years. It can not only be taken as the budget process but also as a tool for making various investment decisions.

1.1.1 Background of Chilime Hydropower Company Limited

Despite, hydropower being major resource endowment of Nepal, it is under utilized. The underutilization of this vast resource has been due to various reasons such as lack consistent project selection criteria, lack of effective planning for developing transmission and distribution system, lack of sustainable policy mechanism, lack of financial resources for investment, lack of confidence on Nepalese Engineers and Technicians for developing hydropower utilizing their expertise without technical assistance from outside, lack of entrepreneurship for

investment in hydropower Sector, excessive dependence on multilateral and bilateral funding for its development, etc.

The nation's hydropower potential has been assessed at 83,000 MW. Of this potential, about 43,000 MW is assessed to be economically viable. Numerous run-of-river and multipurpose hydro schemes have been identified but remain undeveloped. Small and micro hydropower potentials remain virtually untapped in the country.

To date Nepal has developed only about 552 MW of hydropower, which is less than 1% of total hydropower potential of the country. In terms of energy resource endowment of Nepal hydropower occupies first position, but due to large initial investment required for its development, still traditional source of energy such as fuel wood, agricultural residue and animal dung play important role (about 95%) in meeting the total energy consumption of the country. Only less than 1% of the energy demand is met by hydroelectricity serving about 40% of the total population. One reason for the low electrification of the country is that 80% of the country's land area comprises rugged hill and mountain area with undeveloped road infrastructure making extension of power grid difficult. As a result, 132kV transmission line and appurtenant facilities extend east west through the terai plain in the south, and a power grid connects the major population centers of urban areas such as Kathmandu, Pokhara, Hetauda, Biratnagar, Nepalgunj, Birgunj,

Butwal etc. The major medium to large size power generation stations are connected to the foregoing facilities, but electrification remains limited to only those areas effectively within the reach of the grid. As a result, the district headquarters located in the most isolated hill areas must rely on isolated small hydropower sources, which service only the district headquarters and their immediate surrounding area.

Nevertheless, power shortage remains severe despite abundant hydropower potential in the country and this in turn puts a strong brake on the industrial development. In this light, the development of cost-effective hydropower is considered an extremely high priority issue under national planning in order to raise productivity in all sectors of economic activity. In this context, growing power demand in Nepal has to be met from the development of hydroelectric power since Nepal does not posses other indigenous resources than water for electricity generation.

Due to the fact that large scale power generation schemes need more funding and more time for implementation, government policy has shifted to include the private sector in power development and management, in additional to NEA. The Hydropower Development Policy (1992) of HMG/N has opened door to private entrepreneurs, domestic and foreign enterprises both for investment in the study and development operation and maintenance of hydropower projects. As a result,

the private sector has already brought Khimti (60MW), Bhote Koshi (36MW), Indrawati (7.5MW), Piluwa (3MW) and Chilime (20MW) into operation. Some other hydropower projects such as Sun Koshi (2.6 MW), Chaku Khola (1.5 MW) are under construction by Nepalese private power developers.

In this connection, Chilime Hydropower Company Limited was formed and registered with Department of Industry of HMG/N in the year 1995 with the objective of developing hydropower plants in the country. The Company has already brought 20 MW capacities Chilime Hydroelectric Project in operation.

1.1.2 Project Layout

The diversion weir has a crest length of 13 m with 3 m extension for undersluice separated by 1 m thick divide wall. Its height is 3.25 m from the natural riverbed. The size of the Undersluice opening is 3 m x 3 m through which the bed load of the Chilime Khola passes out. Two bays of intake openings of length 5.5 m and height 1.2 m provided with two Trash-racks are made in the upstream of the under-sluice bay. The design discharge of 8.25 m^3/s water is diverted through the Intake towards different types of Surface Structures, such as single gated (size 2.4 m x 2 m) Intake structure of length 30 m with the transition part, almost 50 m long and 2.4 m wide Gravel Trap, 266 m long 2.4 m x 2.4 m approach canal, desander Inlet zone, double chamber desander basin of length 60 m, width 7.5 m and water depth 3.75 m each. Bemdang Khola, a tributary of Chilime Khola is also tapped

constructing a temporary diversion structure and 102m long feeder canal to augment water for power generation during low flow period of the year. The feeder canal from additional source feeds water into power plant system at the upstream of the desander. The clear water from desander is then spilled into desander outlet canal, 58.3 m long and 2.2 m dia. steel Syphon across Bemdang Khola, 130 m long, 2.2 m x 2.2 m Cut and Covered Canal, 241 m long, 2.4 m x 2.4 m sized power canal and Reservoir By-pass canal, 43.5 m long Forebay structure, 414 m long Pressure Conduit. A 2826.5 m long, Headrace Tunnel of four different shapes conveys the water up to the underground Surge Tank of size 31.5 m high and 6.5 m inside diameter, an Inclined Penstock Shaft of length 401 m and Horizontal underground Penstock of length 234.5 m having diameter varying from 2.1 m to 1.3 m conveys water to the two power generating units located inside the Underground Powerhouse of length 42.238 m, width 16 m and height 16.5 m. The tail water is then discharged into Bhote Koshi river utilizing 243 m long tailrace tunnel.

The GIS and seven single phase Transformers are placed inside the underground transformer cavern of length 63 m, width 10 m and height 7.5 m. A switchgear room of length 14 m with size of 12 m x 10 m is the extension of the transformer cavern. The cavern is further extended for a length of 5 m, having size of 4 m x 4 m for fire fighting system. A gross head of 351 m is used for the purpose of electricity generation with the design turbine discharge of 3.75 m^3/sec. Water after

the electricity generation is disposed to the Bhote Koshi River through a 243 m long, 3 m wide and 3 m high Inverted D-shaped Tailrace Tunnel.

The electricity generated by the two power generating units consisting of horizontally placed pelton turbine and horizontal shaft synchronous type generator is evacuated to the national grid through a 38 km long 66 kV transmission line connecting the Chilime power station to the existing substation at Devighat, Trishuli.

The Project was originally designed with an installed capacity of 20.0 MW but due to the installation of high rated capacity power generating equipment with rated turbine capacity of 11.28 MW each and effectively constructed efficient hydraulic structures, the installed capacity of the project has been maintained at 22.10 MW. The power plant utilizes a discharge of $8m^3/s$ to produce power at installed capacity of 22.1MW. All the conveyance system of the project is confirmed to pass $8m^3/s$ of discharge.

1.1.3 Unique characteristic of the Project

In early 90's when the World Bank imposed restriction for constructing hydropower projects by NEA with capacity more than 5MW for investment requiring more than US$ 10 million, without their prior approval. So the development concept of this project was formulated in such a way that it does not

violate the World Bank's imposed restrictors. For the purpose of development of 20MW capacity (CHEP) requiring investment of more than US$ 30 million, a company named Chilime Hydropower Company Ltd. was established in public sector to build, operate and own hydropower projects including Chilime Hydroelectric Project. A license for study of the project was received in 1995 and a license for construction and operation of the project was received in 1997. A team of engineers working in NEA in the year 1993 had identified the project and the feasibility study was undertaken immediately after field reconnaissance. Several alternative studies were carried out from inception stage until the feasibility study stage. The best alternative with the provision of underground powerhouse at Syabrubesi was then selected for developing the scheme, and detailed engineering was continued by Nepalese engineers with out assistance from outside the country. Different level of the project studies for implementation including project identification, feasibility study and detail engineering were completed with the use of manpower of Nepal Electricity Authority (NEA). However, a small job of structural design of canal, desander basin and pressure conduit was given to a local consulting firm named Dip Consultancy. Instead of investing huge money for subsurface explorations, two-test adits, one at powerhouse area and the other at headrace tunnel and surge tank area were constructed. The information on geological conditions from such test adits was then analyzed and interpreted and then incorporated for design of all underground structures. These test adits, were then upgraded as permanent structures of the

project. The construction works of the access road to the head works was initiated by involving local people, specially those families likely to be affected by the project. The earth excavation works of the road was given to different group of the affected families on petty contract basis instead of awarding any contract. This mechanism benefited the local people at large, and helped in maintaining better relation between the project authority and the local community.

All the engineering, planning, construction and supervision works were carried out by the Project itself in the assistance of NEA experts and no other national and international consultants were appointed during the entire project cycle, viz., identification, different phases of studies, preparation for implementation, and ultimately the project construction.

1.1.4 Technical Statement of Project

Table 1.1
Technical Statement of Project

	Description
Items	Chilime V.D.C, Rasua district
Type of Project	Run-Off river
Hydrology	
Catchement Area (Dam site)	180 km2
90% dependable flow	2.3 m3/s
Design flow	8.5 m3/s
Design flood	120 m3/s
Design flood(100 years)	
Geology	
Rock type	Medium grade metamorphosed schist and quartzite
Head	
Gross	410 m
Head works	
Weir	Not Required
Intake Type	Not Required
Number of Gates	Not Required
Headrace Tunnel	
Length	3.75 km
Size	3.0 m (w) x 3.0 m (h)
Surge Tank	
Type	Simple Cylindrical
Size	35 m (h) , 6 m (diameter.)
Penstock	
Size	767 m (l), 1.6 ~1.9 m(dia)
Powerhouse	
Type	Surface
Size	40 m(l) x 13 m (b) x 13 m (h)
Tailrace	50 m(l) x 3 m (b) x 2 m (h)
Turbine	
Type	Vertical Turbine
Capacity	2 Nos., 15 MW each
Generator	
Type	3 Phase Synchronous AC
Rated power	2 Nos., 17 MVA each
Power Factor	0.8
Installed capacity	30 MW (2 x 15 MW)
Annual Average Energy	182.6 GW/h
Transmission Line	
length	12 km
Voltage	66 kV

1.1.5 Project Financing

This Project is owned and implemented by Chilime Hydropower Company Limited a company established in the public sector. The Project financing structure is set as 60% loan from financial institutions of Nepal and 40% equity share of NEA, NEA employees and the public. NEA will cover the default, if any.

1.1.6 Objective of CHPCL

Chilime Hydro Power Company Limited is a public company established with the objective to work on all the generation, transmission and distribution systems. It carries out feasibility study, construction operation and management of small and middle hydropower project. It makes also an agreement between the company and the organization or individual to sale and purchase electricity. Besides, this gives and takes the work in contract between company and the different organization.

1.1.7 Future planning and programs Of CHPCL

CHPCL is now executing three more hydroelectric projects which are various stages of development. The feasibility study of two projects, Upper Sanjen Hydroelectric project (11MW) and Sanjen Hydroelectric project (35 MW) have been completed and application has been submitted for the power purchase agreement with NEA. Both of these Projects are located upstream of the existing Chilime HEP. Local people in the projects are very eager in area to participate in the implementation of these projects. A Latter of intent for financing in upper

sanjen HEP has already been received from citizen investment trust. As soon as the construction of these two projects will starts. The construction license is issued by the Ministry of Water Resources.

CHPCL has also completed the feasibility study of Middle Bhotekoshi Hydroelectric Project (80 MW) located in Sindhupalchok District. Local people of Sindhupalchowk District and other Organizations will be participating in the development of this project. CHPCL is committed to develop more of medium and large scale hydroelectric projects in future with greater participation from various sectors in the country.

1.2 Statement of Problems

The problem towards which study is directed identifies the long-term investment decision in Hydropower sector. Hydropower sector is major competitive power of energy sector. In the present situation, the world has been facing the energy problem. Hydropower is the best alternative sources of energy. Nepal has 83000MW hydropower potential theoretically, out of which about 43000MW is technically and economically exploitable. Increasing demand of electricity is nearly 8.5% per year. All NEA consumers are facing load shedding problem in present situation. Electricity demand is very high in present situation. The current study mainly focus on following problem of CHPP.

1. The research mainly focused on Chilime Hydropower project capital investment decision is better or not?

2. How management tools are used long term project?

1.3 Significance of Study

Nepal is one of the least developed countries with 32% of population living under poverty line. Hence, poverty alleviation is one of the main focus of the government planners and how to reach in the depth. From the 8^{th}, 9^{th} & 10^{th} plans we learned how to control poverty alleviation and three year internal plans of Nepal has also put same aim of poverty alleviation. Thus, to alleviate the poverty and reach the country as developed, public enterprises should play vital role through huge investment. The government of Nepal is only one ultimately way to rescue the country from poverty. So, CHPCL is one of the public enterprise which will be contributed the national through tax amount and it will reduce the electricity scarcity.

Nepal is reach in water resource and very high in hydropower potentiality. In the bitter true sense, there is only way to reach the country in peak of economic destination is from hydro-electricity. Maximize its profit, make well and proper management are the basic needs to invest in hydropower sector. Thus, this study will help the new investor in hydropower sector.

1.4 Objectives of Study

The main objectives of the study are as follows:

i. To evaluate investment worth in rupees.

ii. To plan the Future Net Cash Flow.

iii. To decided the project investment.

iv. To point out the suitable recommendations and suggestions.

1.5 Limitation of the Study

The limitations of the study are as follows:

i. Only Chilime Hydropower project is taken consideration in our study.

ii. The study mainly depended on secondary data.

iii. Only few financial and statistical tools are used it the analysis.

iv. This study mainly focus on capital budgeting.

v. Past four years trend are taken into cost consideration and estimation there after.

vi. The study is concerned with management accounting; it doesn't consider the economic aspects of the companies.

1.6 Scheme of the Study

The overall study work has divided into five chapters.

Chapter- I Introduction

The first chapter consists of the introduction of the study, Statement of problems, objectives of the study, significance of the study and organization of the study.

Chapter- II Review of Literature

The second chapter is review of literature consists of reviews of different dissertations. It's finding recommendations and the Conceptual framework.

Chapter- III Research Methodology

The third chapter is research methodology consisting of research design, nature and scope of data, population and sample size, data collection procedure and data analytical tools.

Chapter- IV Presentation and analysis of data

The fourth chapter is presentation and analysis of data based on facts and figures gathered by different methods i.e. CFAT, NPV, IRR, PI Ratio and major findings.

Chapter- V Summary Conclusion and Recommendations

The fifth chapter is last chapter which includes summary, conclusion and recommendation. Bibliography and appendixes are also included at the end.

CHAPTER - II

REVIEW OF LITERATURE

Review of literature is a way to discover what other research in the area stated problem has uncovered. It provides foundation for present study, establishes a point of departure for future research, avoids needles duplication of costly effort, and reveals areas of needed research. It enables the researcher to know about what research has been done in the subject, what theories have been advanced the approach taken by other researchers and shows gap to fill through the proposed research.

In this chapter, the focus has been made on the review of literature relating to the capital budgeting of Hydroelectric Project. Every study is very much based on past knowledge which is the key of present knowledge. This chapter helps as adequate feedback to broaden the information and to base the inputs of study. Therefore, the review of literature has its own importance.

2.1 Conceptual Framework

The purpose of including this chapter is to clarify the concept of Capital Budgeting Decision of CHPCL. Cash flow estimation, payback period, Accounting Rate of Return, Net Present Value, Profitability Index and Internal Rate of Return has been reviewed with the help of related text books, reference book and articles etc.

2.1.1 Definition of Capital

In general, capital refers to an investment in goods or services that provide benefits over a period of time after their acquisition. However, a substantial portion of governmental spending could be viewed as providing a stream of benefits over an extended period, beyond those activities typically associated with the term “capital” (Robert D. Reischauer, 1998).

Specific definitions of capital can vary significantly depending on the purpose. Some definitions focus narrowly on physical infrastructure, such as highways and buildings; others focus more broadly and include intangibles, such as investment in education and social services. Such differentiation greatly affects the scope of what is considered capital. Each classification has potential shortcomings: A broad definition might encompass so many activities as to make the categorization unhelpful and could invite criticism that a capital budget would simply be a device for understating the cost of federal spending; a narrow definition could lead to a bias against spending that does not directly result in the acquisition of physical assets (E. O’ Neill April 24, 1998).

Another set of issues arises from the fact that the federal government pays for more investment than it owns. Roads, airports, and mass transit systems, for example, are paid for at least in part with federal tax dollars but are under the control of state and local governments or independent authorities. The definition

of federal capital might therefore include those expenditures, on the basis of who pays for them, or exclude them, on the basis of who owns them.

Various budgetary and financial reports that are currently available provide differing perspectives on capital spending.

Reports by the Office of Management and Budget

In its annual instructions to agencies' budget officers in Circular A-11, the Office of Management and Budget (OMB) defines federal capital assets as "land, structures, equipment, intellectual property (e.g., software), and information technology (including IT service contracts) used by the Federal Government and having an estimated useful life of two years or more (www.cbo.gov).

2.1.2 Capital expenditure:

Capital expenditure is an expenditure intended to benefit future periods, in contrast to a revenue expenditure, which benefit a current period; an addition to a capital asset. The term is generally restricted to expenditures that add fixed assets units or that has the effect of inversing the capacity, efficiency, life span or economy of operation of an existing fixed asset.

From the above definition it follows that capital expenditure is one which result in:

i. Increase in quantity of fixed assets.
ii. Increase in quality of fixed assets.

iii. The replacement of fixed assets.

2.1.3 Revenue Expenditure

Expenditure charged against operation a term used to contrast with capital expenditure. While capital expenditure is any expenditure benefiting a future period, revenue expenditure is intended to benefit the current period. Examples are:

i. Expenses incurred in the normal course of business, e.g. expenses of administration, expenses incurred in manufacturing and selling products.
ii. Expenses incurred to maintain the business, e.g. replacement for maintaining the existing permanent assets: cost of stores consumed in the course of manufacturing, e.g. oil, cotton waste.
iii. Cost of goods purchased for resale.
iv. Depreciation on fixed assets, interest on loan of business, loan from sale of fixed assets.
v. Obsolescence cost.

2.1.4 Objective of Budgeting

The main purpose of budget is to ensure the planned profit of the enterprise. So, it is considered as a tool of planning and controlling the profit. On of the primary objective of an annual budget is to measure the profit expectation for the next

financial year with regarded to all the circumstances favorable and unfavorable that can influence the trading prospect.

The main purposes of budgeting are:

1. To help provide direction for choosing from among many future alternatives.
2. To help identify potential problem of achieving the specified goals and objective.
3. To communicate objectives, constraints and expectation of budget to people through out an organization.

The main objective of budgeting may summarized as follows:

1. It is a plan, which reflects the policy of a business in financial terms.
2. It is a plan of action and services as a declaration of policies.
3. It is a control document by which management can monitor actual performance.
4. It is the plan to forecast for future to avoid losses and to maximize profits, i.e. to help in planning.
5. It is a plan to state the firm's expectations (goals) is clear, formal terms to avoid confusion and to facilities their attainability.
6. It defies the objective for the entire executive's communication.

7. It is a plan to bring about co ordination between different functions of an enterprise i.e. to help in co ordination.
8. It is a plan to communicate expectations to all concerned with the management of the firm so that they are understood, supported and implemented.
9. It acts as a motivator of employees.
10. It provides a means of coordination and communication.
11. It is a measure against which to evaluate the quality of management.
12. Budget facilitates centralized control with delegated authority and responsibility (Rathnam,1997:2).

2.1.5 Characteristics of Good Budgeting

The characteristics of good budgeting are as follows:

1. Budget may be formulated for the organization as a whole or for any sub-unit.
2. A good system of accounting is also essential to make the budgeting useful.
3. A budget is a qualitative expression of a plan of action and aid to coordination and implementation.
4. A good budgeting system should involved persons at different levels while preparing the budgets the subordinates should not feel only imposition on term.

5. Budget is designed to carry out a verity of functions planning, evaluating activities and implementation of plans.

2.1.6 Classification of Budgets

Budgets may be classified from various viewpoints depending upon various bases adopted for such classification. The following bases of classification are generally in use:

I. On the basis of time. II. On the basis of function.

III. On the basis of flexibility IV. On the basis of nature of business activity

I. On the Basis of Time

On the basis of time, there are three types of budgets. They are:

a. Long Term Budget

These budgets normally cover of a firm over a prospective of five to ten years.

b. Short Term Budget

These budgets are usually prepared for one to two years. These are always prepared of production plan in monetary terms.

c. Current Budgets

These budgets are usually prepared for one to twelve months and are the short term budgets adjusted to current conditions or prevailing circumstances.

II. On the Basis of Function

Those budgets whose number depends on the size and nature of the business are called functional budget. Normally the following are the types of functional budget.

a. Sales Budget

It is primary budget of PPC. This is a forecast of total sales classified according to groups of products, salesman and geographical.

b. Production Budget

Production budget is transformation process of sales budget. It is a forecast based on sales, productive capacity and requirement of inventories.

c. Direct Material Budget

Direct material budget can also be classified into two types:

i. Direct Material Usage Budget

Material budget is prepared after the determination of production need. Material consumption budget is depended upon production volume. Material consumption per unit of output helps to prepare material use budget for different of materials to be consumed by output. Budgeted production volume multiply by material per unit of output gives the budgeted consumption of materials.

ii. Direct Material Purchase Budget

Manufacturing company purchases raw materials for its products to be produced. The quantity of materials to be purchase is determined by both production volume and inventory requirement or material requirement increasing or decreasing inventory equal to material purchase. Purchase budget helps to determine the quantity and volume of materials required to be maintained (Munakarmi, 2002:220).

d. Direct Labor Cost budget

Labor cost budget is calculated on the basis of labors for budgeted production volume and labor hour related for each type of labor force. Given budgeted production, the engineering and personnel department can work together to determine the necessary labor requirement for the production department. Labor requirements are stated in total number of workers, specific number of skilled and unskilled workers and production hour need for given production volume. Labor cost computation includes monetary cost and fringe benefits given to labor force (Munakarmi, 2002:222).

e. Overhead Budget

Overheads, here are classified as factory overhead, administrative overhead and selling overhead. Factory overhead is also known as manufacturing or works overhead. It is aggregate of indirect expenses of factory department. It includes

both variables and fixed overhead and including following expenses: factory rent and rates, lighting and heating, factory power, fuel and insurance, factory salaries, indirect wages and pension, factory stationary and printing, canteen, medical, educational and entertainment facilities to the factory workers repair and maintenance expenses, depreciation etc.

f. Cost of Production Budget

Budgeted production cost is known as cost of production budget. It is the aggregate of budget material cost, budgeted direct labor cost and budgeted factory overhead.

g. Selling and Administrative Expenses Budget

Selling and administrative expenses include both fixed and variable expenses. Administrative expenses include critical wages and executive salaries, supplies, postage and telephone etc. Likewise selling and distribution expenses include sales commission and salaries, advertising and sales services expenses, traveling expenses, carriage and freight on sales, packing cost etc.

h. Cash Budget

The cash budget show the firm's projected cash inflows and outflows over some specified period. It provides much more detailed information concerning a firm's

future cash flows. It is the most important tool for managing cash. The cash budget is useful in determining when cash surpluses or shortages will occur.

i. Capital Budget

Capital budget involves the entire process of planning expenditures with returns that are expected to extend beyond one year. The choice of one year is arbitrary, of course, but it is a convenient cut off point for distinguishing between kinds of expenditures. Obvious example of capital outlays are expenditures for land, buildings and equipment and for permanent additions to working capital associated with sales growth.

III. On the Basis of Flexibility

On the basis of flexibility, budget may be classified into two types.

a. Static Budget

It shows only one active level at once. They don't change in the volume of activity. Such budgets are usually prepared from one to three months in advance of the fiscal year to which they are applicable.

b. Flexible Budget

It shows the series of activity level. The main objective of flexible budget is to select least cost combination for the firm. In case of such budgets, revenue and

cost targets are set in respect of different level of activity even from zero to hundred percent of production volume.

IV. On the Basis of Nature of Business Activity

Budgeted may also be classified on the basis of nature of business activity. They are:

a. Capital Expenditure Budget

Capital expenditure budget is needed to compute or plan the cost of capital and appraise the project. Such budgets assume more significance in the case of large and progressive manufacturing concerns.

b. Operating Expenditure Budgets

Operating budgets deal with the plan for routine activities. These budgets are based on forecast like sales, reproduction costs, revenue etc.

2.1.7 Budgetary Control

Budgetary control is a system of controlling cost, which includes the preparation of budgets coordinating the departments and establishing responsibilities, comparing actual performance with the budgeted and outline upon results to achieve maximum profitability.

Budgetary control involves the following process:

Preparing budgets sets.

1. The actual figure is recorded.
2. The budgeted and actual figure is compared for studying the performance of different cost centers.
3. If actual performance is less than budgeted norms, a remedial action is taken immediately.
4. The business is divided into various responsibility centers for preparing various budgets.

2.1.8 Problems and Limitations of Budgeting.

Budgeting is not fast proof; it can suffer from certain problems and limitations.

The major problems of budgeting system are as follows:

1. Developing meaningful forecast and plans especially the sales plan.
2. Seeking the support and involvement of all level of management.
3. Establishing realistic objectives, policies, procedures and standards of desired performance.
4. Maintaining effective follow up procedures and adopting the budgeting system wherever the circumstance changes.
5. Applying the budgeting system in a flexible manner.
6. Educating all individuals to be involved in the budgeting process and joining their full participation (Welsch, Hilton and Gordon, 2000:56).

The following are the limitations of budgeting system;

1. Budgeting is not an exact science it success hinges upon the precision of estimates.
2. The installation of a perfect system of budgeting is not possible in a short period. Budgeting has to a continuous exercise. It is a dynamic process.
3. The success of the budgetary program is to understand by all and that managers and subordinates put concerned effort for accomplishing the budget goals.
4. Budgeting will be ineffective and expensive if unnecessarily detailed a complicated. It should be flexible and rigid in applications.
5. The presence of a budgeting system should not make management complacent. To get the best results of management, management should use budgeting with intelligence and foresight. Budgeting can not replace management.
6. The purpose of budgeting will be defeated if carelessly budget goals are determined as the conflict with enterprise objectives.
7. Budgeting will hide in efficiencies if a proper evaluation system lacks. It should be re-examined regularly.
8. Budgeting will lower rural and productivity if unrealistic targets are gets and if it is used as pressure tactic (Welsch, Hilton and Gordon, 2000:57).

2.1.9 Technique of capital budgeting

1) Traditional methods.

I) Pay back period.

II) Average rate of return or accounting rate of return.

2) Discounted Cash flow methods.

I) Net present value.

II) Profitability index.

III) Internal rate of return.

1. Traditional Method

The oldest and simplest method is traditional method. But it is not so useful method. It does not consider time value of money. It assumes that present value is equal to future value.

There are many methods under it.

I. Payback Period

This method computes the payback period of investment. In this period, the smallest period is acceptable. Thus it considers liquidity but it ignores time value of money so it can be called as one sided method. The mathematical expression is;

$$\text{PBP= Minimum year} + \frac{\text{Amount to Recover}}{\text{Cash flow during the year}}$$

II. Average Rate of Return or Accounting Rate of Return

It is the method represents the ratio of the average annual profits to investment is projects. In this method, the projects are ranked in order to earning project which yields the higher return are selected here and ruled out.

$$\text{Average Rate of Return} = \frac{\text{Average net income after tax}}{\text{Initial outlay}}$$

2. Discounted Cash Flow Method

Discounted cash flow method provides more objectives basis for evaluating and selecting investment projects comparing of investment worth by discounting the year.

- Net cash investment
- Annual net cash inflow
- Average Income
- Average Investment

Future earning in to present value. There are three different methods under discounted cash flow method.

I. Net Present Value

It is also known as net gain method. Comparison is made of investment worth by discounting the future earning in to present value. The different between the present value of the project cash flows and outflows discounted at the cost of capital is known as net present value.

II. Profitability Index or Benefit Cost Ratio

Profitability index is sometimes refers to benefits – cost –ratio and excess present value index. It is calculated dividing the PV of future cash inflow after tax by PV of cash outlay. It is the ratio of present value of net cash benefits to the present value of net cash outlay. "PI is a ratio of the present value of future cash benefit, at the required rate of return, to the initials cash outflow of the investment". PI may be gross or net. Gross PI is calculated as follows:

$$\text{Gross PI} = \frac{\text{present value of cash inflow}}{\text{present value of cash out flow}}$$

III. Internal Rate of Return (IRR)

The internal rate of return (IRR) is defined as the interest rate that equates the present value of the expected future cash flows or receipts, to the initial cost outlay. The equation for calculating the internal rate of return is;

$$\text{IRR} = \text{LR} + \left[\frac{\text{NPV}_{\text{LR}}}{\text{NPV}_{\text{LR}} - \text{NPV}_{\text{HR}}} \times (\text{HR} - \text{LR}) \right]$$

(Weston and Copland, 1991: 311)

IRR is the rate of return that an investment project earns. It is that rate which gives the projects NPV zero. It is used when the cost of the projects and annual cash inflows are given or known but unknown rate of earning is to be determined. It is

discounted. It is a discount rate that makes the PV of future cash inflows the project equal to the cost of project.

2.2 Historical Perspective on Power Development in Nepal

A study of available articles and literature suggest that the history of Power development in Nepal can be compassed to the following three periods:

2.2.1 Ranna Regime

The history of electricity in Nepal is dated back to 1911 A.D. on May 22 of this year, pharping, with a capacity of 500 KW was commissioned. This happened to be the first ever power station of Nepal. It took another twenty-eight years for a second power station, Sundarijal, with the capacity of 640 KW was built. Britain, which helped built both of these stations thus, became pioneer in introducing Nepal to the world of electricity. No wonder Nepal's system now is based on tradition left behind by the early British experts. The 50 HZ frequency, 11 kv\230v distribution voltage level adopted in Nepal very much speak for the British influence in Nepal's power system. Nepalese socio-political environment then was very much agrarian and feudalistic in nature. Only those close to the ruling class enjoyed the benefits of electricity.

2.2.2 Panchayat Regime

Under the Soviet Union grant, Panauti (2.4MW) (2002 BS) was the first hydro power station built the during the panchayat era. A stride was taken when Trishuli (24.5 MW) was built and commissioned in 2023 BS (1967 AD) with Indian cooperation. Sunkoshi Hydropower station (10 MW) was Built under the Chinese grant in 2029 BS (1972 AD). Subsequently, at Pokhara, Dhankuta, Surkhet, Doti, Jomsom, Jumla and Phidim small Hydropower stations were built and commissioned. With these developments, Electricity became easily available to the general public and also paved the way for industrialization in the country.

Kulekhani-1 (60MW) built and commissioned in 1982AD with Japanese assistance, became the first ever high dam power station of Nepal. In a cascading structure, Kulekhani-2 Power station (32 MW) came into line in 1986 AD. Marsyangdi with a capacity of 69 MW was built and commissioned in 1989. Thus, Nepal could reach a position of boosting a respectable figure of few hundred MW of installed capacity during this era.

2.2.3 Democracy Regime

Formulation of the policies in line with the changed scenario was the foremost task before the first government of democracy era. The promulgation of laws and policies like industrial enterprises act, Electricity Development Policy, industrial policy, foreign investment and Technology Transfer Act (1992).etc heralded the era of private participation in Power sector of Nepal.

The first power station to come in line after restoration of multiparty democracy was the Multifuel Power plant with a capacity of 26 MW. Andhikhola and Jhimruk both owned by Butwal power company were commissioned in 1991 and 1994 respectively. But these additions were not enough to satisfy the rising demand. The country was banking on Arun-III to meet the power needs, which was torpedoed by the World Bank scrapping of the Project. Unfortunately, the political turmoil of the 1989-90 and the so called no-option trap allegedly contrived by the proponents of Arun-III project led to a situation whereby there was no ready alternative plan for meeting the power demand in the event of cancellation of Arun-III. Consequently, the post 1990 period saw unprecedented power crises. The situation entailed that khimti-1 and Bhotekoshi the only power project ready for take off be speeded up. Power Purchase Agreements were concluded for the development of Khimti-1 and Bhotekoshi Hydropower projects. The first unit of Khimti-1 delivered on chaitra 10, 2056(March 23, 2000) and Bhotekoshi was commissioned on Poush 19, 2057. This greatly facilitated in balancing the supply demand equation. However, the peak time continued to see the deficit.

In March 13, 2000 (Falgun 30, 056) Puwa Khola Hydropower project undertaken by NEA was synchronized for the first time. Prior to this commissioning of Tanakpur-Lalpur 132 kv line in Dec 3, 1999 (056\8\17) enabled Nepal to receive 70 million unit of annual free energy from India. In the meanwhile, in 1997,

second phase of Multifuel Plant in Duhabi was commissioned and 13 MW of power was added to the system.

The first unit of kali Gandaki-A (144MW) is planned to be commissioned in March 22, 2002 (Chatira 9, 058). With this 48 MW will be added to the system and the existing deficit of about 20 MW will be served.

Under German grant, Middle Marsyangdi (70) is under construction and is stated to be completed in 2004. Chilime power project being promoted as a model project in terms of use of ingenious capital, management and technology is expected to start generation from the end of 2002. On the private sector, a good number of PPAs have already been signed. So Nepal is all set to make a major stride in power development within few years. After the commissioning of all units of Kaligandaki "A" the total capacity of NEA system will be 558.2 MW including 113.4 MW of capacity of IPP.

The first period is characterized by private sector initiatives. The main thrust of hydropower development in Nepal during the panchayat period is mostly confined to public sector effort and is characterized by, as per Mr. S.B. Pun, bilateralism and multilateralism (Pun, 1999). Liberalization and privatization is major change that took place in post democracy era in power development, attracting foreign as

well as local investors to this sector. Mr.S.B.Pun commented the following with reference to the history of power development in Nepal (Pun, 1998).

Those private sector initiatives in the Nepalese power sector are dead and forgotten chapters. Very few have memories about them, which I now believe, was Nepal's real golden period in the power sector. This was an era where domestic capital mobilization and indigenous capability building that we so much talk about now, really took place".

"The charm of bilateralism had a magnetic apple; roads, powerhouses and transmission line being built free on grants. Yes, they were a few political pills to swallows but we generally believed ourselves as Zamindars, to be fed free lunches. Most of us, engineers, unwittingly became glorified clerks acting as were liaison officers of to projects and signing on the dotted line. We totally failed to read the writing on the wall, that on the wall, that one day we got to pay heavily for these free lunches. Multilateralism definitely has its charm: hundreds of million of denominated loans, a grace period of about 8 years, a comfortable maturity period varying from 23 to 40 years, a nominal service charge not exceeding 1% plus a commitment charge of about 0.5% Nepal felt that this was a manna from heaven not to be questioned at all with a strong multilateral donor in the lead other benefit accrued like grants and soft loans from other bilateral donors. Nepal really fell in live with this mechanism. But after three decades of

operation in the power sector with the likes of Kulekhani, Marsyangdi and the aborted Arun-II, the honeymoon phase was over and things loosed a bit sour. First the donors were unhappy. They complained that despite pouring in billion of dollars there were hardly any trickle down effect to the real poor people, there was no impact on poverty alleviation as manifested by the start 32% of the population wallowing below the poverty line, also there was no progress in making transparent dealings but instead an increase in rampant corruption fueled by political chaos. As the recipient, Nepal was equally unhappy: its power sector in shambles with actuate load shedding, extremely high tariff and belated realization of the impact of the strings of conditional ties it happily put its signature on, the donors total grip on the country's macro-economic activities and the regular prescription in the from of structural adjustment programs. In our honeymoon fervor, Nepal forgot the virtues of domestic capital mobilization and the domestic capability building. It is in fact the donors not us who wanted our attention to be focused on those forgotten virtues. This made someone recite the Nepalese proverb "A women is not a woman unless she has given birth to a child, and a man is not man unless he has built a house" in the Nepales power sector there was not single "man"- a man of the likes of Pada Sunder Mall and OD Hoftun".

In four decades, Nepal has completed a full circle and come back to where it had started the private sector 1939. It's not only the utilities but the countries themselves that are cash strapped. Our objective of deregulation is to create an

environment whereby the IPPs will bring in his precious private resources for developing the power sector. The Asian and Latin American economies are booming though some hiccups are being felt with the Asian meltdown. Our load growths are continually in the double digits. It is this load growth and it is this job opportunities that the IIPs, mushrooming in the developed western countries, are eyeing in the vast emerging markets of China, India, Brazil and even Nepal. The evolving role of the multilateral institutions from that of the leaders to public enterprises to that of the facilitators to private investment is a recent happening. The World Bank's Power Development Fund is the new Mantra for Nepal. Acts and regulations were and are being rewritten to attract the private sector. The hard realities of attracting the foreign investors are that repayment to attract the private sector. The hard realities of attracting the foreign investors are that repayment will have to be dollar denominated, tariff suitably escalated and non-payment of dues fully counter guaranteed by the government.

2.2.4 The structure of Nepalese Power Sector

One can think of Nepalese power structure comprising of three tiers-Licensing Authority, the utility and the Tariff regulating Authority. Department of Electricity Department (DED) represents the licensing authority NEA is the generation transmission and distribution utility, and Electricity Tariff Fixation Commission (ETFC) is the tariff regulating authority. DDE is a government department, NEA is a public enterprise wholly owned by the government and ETFC is a quasi-

government agency. Beside these three, there is also a research and consulting wing under Ministry of Water Resource, called Water and Energy Commission Secretariat (WECS).

According to the present structure, the Ministry of Water Resources is the apex ministry responsible for overall power sector policy. It has a Water and Energy Commission Secretariat as the policy advisory body that formulates short and long term water and energy policies. The Department of Electricity Development aims to help develop hydroelectricity and encourage private sector entrepreneurs through licensing, promotion and one-window mechanism.

The Tariff Fixation commission is a regulatory agency that reviews and approves tariff. Electricity Tariff Fixation Commission is constituted under Electricity Act 2049.

The NEA in accordance with its own act is a public sector undertaking permitted to generate, transmit and distribute electricity throughout Nepal. NEA is the result of amalgamation of Nepal Electricity Corporation and Electricity Department in August 1985 (Bhadra 1, 2042 BS). Prior to the creation of Nepal Electricity Authority, then Electricity Department of HMGN had the responsibility of development and construction of power projects whereas the than Nepal Electricity corporation was involved in generation, transmission and distribution of electricity.

At a time when IPPs are coming up in the field of power generation, NEA has retained its identity as the sole purchaser of power generated by the IPP. Following the issuance of survey and development licenses to BOT\BOOT promoters by the Ministry of Water Resources, IPPs have to sign power-purchasing agreement to sell their output to the NEA.

The present structure of Nepal's energy sector is not regarded as strong enough to provide efficient service. Despite the liberalization of the sector, NEA still remains the sole body for energy transmission and distribution. Overstaffing and frequent political intervention along with high energy losses have increase overhead costs. Thus, there have been growing calls for father reforms in the energy sector to bring in efficiency.

Under the current institutional framework, there is no clear separation of policy, regulatory, and operational functions in the electricity sector. Furthermore, coordinating bodies designed to ensure consistent policy making between sectors is not functioning adequately (The World Bank, 2000). It is also observed that there is an overlapping roles and responsibilities and conflict of interest between different institution involved in the power sector development. Therefore, clarifying roles and responsibilities of public sector institutions as well as private sector participation is most for creating and environment that will accelerate power development in the country in a sustainable manner.

2.2.5 Power Policy for the future

In the context of restructuring of power sector and Privatizing of NEA in future, the World Bank has of the following suggestions (The World Bank 2000):

- Though in the South Asian regional context NEA, as an integrated utility has been performing better than many other publicly owned publicly owned utilities, serious problem still persists. Its operational efficiency is weak (transmission and distribution losses of the NEA system (technical and non-technical) are around 30% and is some as high as 50 percent), its credit worthiness is insufficient to allow access to private capital markets, and there are growing conflicts of interest with existing and new independent power producers, some of which are joint ventures between private investors and NEA for which NEA is also a principal buyer.
- The need for restructuring NEA is clear and the rationale for restructuring is grounded in the needs for the future, inter alias, mobilizing private capital necessary for much lager future facilities contemplate by NEA's generation expansion plan (such as Upper Karnali and Arun).
- The Bank has also suggested some restructuring models that are appropriate to Nepalese context. At the same time it also suggest that before deciding on suitable configuration for unbundling of the power sector, preparatory studies are required which should include, inter alia, definition of technical boundaries, allocation of assets, liabilities and personnel, transfer pricing, dispatch and system operation rules, wheeling arrangement etc.

- Restructuring issues is beyond the scope of this study. However, in analyzing emerging scenario of power market and its implication on financial and operational efficiency of NEA, this development in power sector is also has to be considered to some extent and therefore some highlights are deliberated in this study.
- HMGN has published Electricity Development Policy-2058. Unbundling of the present power sector and granting more roles to private sector – these are the major policy planks for the future.

The policy envisages achieving the following by year 2007:

- A dominant private sector contributing 75% of total investment in hydropower.
- Boosting of industrial consumption by 125%.
- Establishment of power development fund and infrastructure development bank.
- Boosting of the hydro capacity to meet a demand of 820 MW of which 70 MW to be export.
- Privatization of NEA.

Similarly, the hydropower policy and strategies aims at the following by year 2017:

- Development to hydropower to meet a demand of 2230 MW including 400MW for export;
- Expansion of electricity coverage of households to 38%

By years 2027, the policy and strategies aims at:

- Developing hydro capacity to meet a demand of 22030 MW including 15050 MW for export.
- To increase the household coverage to 60%.

The objectives and policies of the new electricity development policy 2058 are summarized below.

Objectives

1. To utilize the existing water resource of the country and produce electricity at a low cost.
2. To make the electricity service dependable, reliable and extend qualitative service within the whole kingdom at a reasonable rate.
3. To tie-up the electrification with the economic activates.
4. To extend the rural electrification in order to support rural economic development.
5. To develop hydropower as and exportable commodity.

Policies

1. Efforts shall be made to maximize the use of country's hydropower potential in order to meet the domestic demand of electricity.
2. The construction and, implementation of hydropower projects shall be encouraged to promote on the principle of Build-Operate-Owned-Transfer (BOOT).

3. For making the electricity service dependable, reliable and extension of qualitative service delivery within the kingdom at a reasonable cost: the existing public sector institutions shall be restructured to promote the participation by creating competitive environment of community corporation, institution local agencies and private sector in hydropower production transmission and distribution.
4. Small and medium hydropower project shall be developed and promoted for domestic use in order to strengthen the situation of domestic power supply. The priority shall be given to develop hydropower projects on a competitive basis suitable to the electricity system.
5. The hydropower projects shall be identified for export purposes. The private sector shall export the electricity by developing such projects.
6. The major multipurpose storage projects shall be developed in a way to render the maximum down stream benefit to the country.
7. The electrification program in the remote rural areas shall be encouraged by operating the small and mini hydropower projects at local level.
8. The rural electrification programs shall be expended in order to make the electricity services available to maximum people. A “Rural Electrification Fund” shall be established for this purpose.
9. The rural electrification development program shall be based on mobilization of people’s participation.

10. To deliver reliable and dependable electricity services and make it easily available to consumers and attention shall be made to safeguard their interests.
11. For supplying the electrical energy at a reasonable rate, the electricity tariff fixations process shall be made transparent and reasonable.
12. The unauthorized leakage of electricity shall be controlled. For this purpose necessary technical measures shall be adopted and legal arrangements shall be formulated. Besides these measures an emphasis shall be given to mobilize people participation to control the leakage.
13. Incentives shall be provided for the proper utilization of electrical energy, in this context, incentives shall be provided for the use of electrical energy demand is low (when supply is in excess of demand.)
14. The appropriate incentives provision shall be made to attract national and foreign investment for the development of hydropower and transparent process shall be followed.
15. Capital market shall be operated for investment in the electricity sector.
16. The use of local labor and skill shall be given priority in implementing the hydropower projects.
17. The industry producing the construction materials and equipment to be used in the electricity sector shall be encouraged to develop the industry.
18. Project arrangements shall be made to cover the risks arising in hydropower project.

19. Arrangements shall be made to provide appropriate benefits at the local level while operating hydropower projects.
20. The Adverse effects on environment shall be minimized caused due to the development and operation of hydropower projects and proper arrangements shall be made to resettle the displaced families.
21. Hydropower shall be developed to replace the biomes and thermal energy in order to contribute towards environmental conservation.

2.2.6 Corporate Development Plan 2001 of NEA

Elaborating the role of IPP in future, NEA's corporate development plan of December 2001 highlighted the following.

"Also in the future, joint ventures with private investors enter as a possible formula in hydropower development along BOT\BOOT lines. Such ventures are now being proposed for the Upper Karnali 300 MW, khimti 26 MW and Thulo Dhunga (24 MW) hydropower projects.

NEA, in the meanwhile, retained its identity as the sole buyer of power generated by the independent power producer (IPP). Interest shown by the IPPs was encouraging under market-strapped conditions. Following the issuance of survey and development license to BOT\BOOT promoters by the Ministry of Water Resources, several more IPPs sought to sell their generation to NEA including

those for the projects of Madi I (20 MW), Upper Marsyangdi II/III (300 MW) and the Lower Modi (20 MW). Also, in accordance with the NEA's commitment to by up to 50 MW of generation from small hydropower projects in the range from 1-10 MW, power purchase agreement (PPA) were signed for purchase of power from the Syange (0.1MW), Pheme (0.95MW), Khudi (5MW) and Mailung (5MW) Khola Small Hydropower Projects. NEA also entered into a agreement for power purchae with Butwal Power co.(BPC) from their Andhi Khola and Jhimruk Plants previously.

2.3 Review of Thesis

A. Mr. Joginadar Goet

Mr. Joginadar Goet (1999) had conducted a research on the topic of ***"Revenue Planning in Management in Nepal: A case study of Nepal Electricity Authority"***. Some remarkable finding pointed out by Joginadar Goet is as follows:

Findings

1. NEA has not considered major demand determinants of electricity such as family income, price of electricity, connection charges, cost of alternative, and cost of auto generation and reliability of NEA's services.
2. No plan and program have been made about possible consumption of electricity in agricultural sector.

3. Target growth is sales revenue was never achieved except in the year 1995/96. This shows that NEA has failed to convert sales unit into sales revenue.
4. There is absence of actual meter reading by dint of which, the charged bills are very low and non reconciliations have been made between units and units billed as well.
5. Revenue and not recognized on accrual basis.

Recommendations

1. NEA should consider demand determinants such as family income, price of electricity, connection charges, cost of alternative available, cost of self generating of electricity and reliability of NEA service while forecasting demand.
2. NEA should prepare programs and plans for agricultural sector which is capable of massive consumption of electricity.
3. NEA should introduce programs and action plan for the reduction of transmission loss, both technical and non technical. NEA can improve its efficiency in the meter device instantly either by changing old meters or utilizing only efficient matter readers or by improving its transmission system. Non technical loss can be reduced by adopting effective managerial, social, legal and others measures.

4. Billing should be based an actual matter reading or reasonable estimates of past consumption in the absence of actual meter reading.
5. Revenue should be recognized an accrual basis to comply with present accounting manual.

B. Mr. Dilli Raj Sharma

Mr.Dilli Raj Sharma (2000) has submitted his research work on the topic of ***"Revenue collection of NEA"*** had the following findings and recommendations:

Findings

1. The revenue of NEA is increasing yearly.
2. There has been fluctuating trend of revenue in NEA
3. The revenue from industrial sector is more fluctuating.
4. There is no important in the revenue collection of NEA despite the government efforts in this field.

Recommendations

1. To improve revenue collection of NEA, the government should issue circular to all officers to pay their outstanding bill to time.
2. Adequate counter facility is necessary for revenue collection.

3. Payment facility is also a factor it saves the customers' time and transportation cost, NEA should make necessary arrangement for payment of bill through bank.
4. Leakage should be controlled for the improvement of the revenue.
5. Line connecter producer should be made shorter.
6. Assessment of electricity tariffs should be specified.
7. Line disconnection should be properly managed.

C. Mr. Ghana Shyam Thapa

Mr. Ghana Shyam Thapa (2004) has submitted his research work on the topic of ***"Profit Planning in Nepalese public enterprises: A case study of NEA."*** He has tried to analyze and evaluate the financial performance of NEA in terms of profitability and rate of return on the basis of selective financial tools. He has concluded some objectives, findings and recommendation as under.

Objectives:

1. To examine the present profit planning premises adopted by the NEA.
2. To highlight the various functional budgets of NEA.
3. To evaluate the variances between planned and actual performance of NEA.
4. To provide the valuable suggestion and recommendations on the basis of study

Findings

1. NEA prepares both tactical and strategic profit plan but strategic plan is confined only to the top level executive.
2. NEA's actual sales revenue budgeted and actual production unit and amount of overhead are in increasing trend.
3. Achievement of capital expenditure is satisfactory.
4. Present power distribution system of NEA is not sufficiently efficient.
5. NEA has huge amount of long term liability.
6. NEA has not utilized its available capacity satisfactorily.
7. NEA has not maintained sound liquidity.
8. NEA's financial performance is not satisfactory because its return on investment is negative or very poor.
9. NEA has not prepared plan and program for the agriculture sector's consumption of electricity.
10. There is lack of proper co-ordination between various directors in regard of the goals, objectives and strategies.

Recommendation

1. To improve revenue collection of NEA, the government should issue circular to all officers to pay their outstanding bill to time.
2. Adequate counter facility is necessary for revenue collection.

3. Payment facility is also a factor it saves the consumers' time and transportation cost, NEA should make necessary arrangement for payment of bill through bank.
4. Leakage should be controlled for the improvement of the revenue.
5. Line connecter producer should be made shorter.
6. Assessment of electricity tariffs should be specified.
7. Line disconnected should be properly managed

D. Mrs. Radha Devi Ghimire

Mrs. Radha Devi Ghimire (1998) has made a research on ***"Profit Planning, A case study of Harisiddhi Brike and Tiles Factory Limited."*** which is Submitted to faculty of management, central department of TU. In the study, she has pointed out some features and problems of profit planning, prevailing practices and premises for implementing profit planning in HBTF.

The basic objectives of her research work were:

1. To examine how far the HBTF has applied profit planning system in their organization.
2. To analyze the trend of profit over the period under cover from FY 2046/47 to 2053/54.
3. To analyze the various functional budgets adopted by this enterprise.
4. To analyze the variance between budgeted and actual achievements.

5. To point out suitable suggestions and recommendations.

Mrs. Ghimire research work concludes that HBTF has been suffered from a number of internal problems in formulating and implementing profit plan. She has pointed out various findings and recommendations, among the few major findings and recommendations are as follows:

Findings:

1. Role conflict and lack of co-ordination among departments.
2. Inadequate evaluation of relevant internal and external market variables.
3. Unrealistic sales forecasts.
4. Lack of optimum capacity utilization, loss is increasing trend each year.
5. Lack of dynamic and effective cost control program.
6. Inadequate planning due to lack of planning experts.
7. Completely ignored to variance analysis.
8. Lack of entrepreneurship and commercial concepts in overall operation of the enterprises.

Recommendations:

1. The Factory should be identified and evaluated external and internal variables that influences the company and should have in depth analysis of the weakness.

2. HBTF should clearly define its broad objectives because objectives are the basic guidelines and these create and maintain optimum enterprises environment that maximize the interest and motivation of all employees.
3. Profit planning manuals should be communicated from top to low level.
4. Company should have to utilize its capacity to meet the target production, which will provide encouragement to get profit.
5. For the proper co-ordination within organization line and staff, authorities and responsibilities should be clearly defined. This will considerably help to solve the problem of conflicts between departmental managers.
6. Sales forecasting should be made on the realistic ground. Forecast should include strategic and tactical forecasts that are consist with the time dimensions used in the comprehensive level.
7. Volume of inventories should be reduced to optimum level.
8. Costs reduction program should be formulated and applied and present cost capacity structure should be changed, efforts to reduce fixed cost should be made.
9. System of periodical performance reports should be strictly followed to be conscious about poor performance and to take corrective action timely.
10. A systematic approach to comprehensive profit planning is essential to adopt in the factory.

E. Deepak Bhattrai

Mr. Deepak Bhattrai (2007) has submitted his research work on the topic of *"A **Study on Management of Income and Expenditure of Butwal Power Company Limited.*** This Research of Mr. Bhattrai is highlight to the Management of income and expenditure. In this research Mr. Bhattrai has concluded some objectives, findings and recommendation as under.

Objectives

The primary objectives of the study, is to study the management side of the financial budget and special emphasis will be given to income and expenditure. Apart from primary objective following are the other objectives of purposed study.

1. To study of sales budget and its achievements of BPC.
2. To analysis on income and expenditure of BPC.
3. To shows the relationship between income and expenditure with profit.
4. To recommendation and suggestion for improving the profit plan.

Finding

Butwal Power Company is running in profit because of the BOD, management and staff of the company of their dedication and contribution to the company. BPC's production capacity is stable and demand of electricity is high in Nepal. First priority gives BPC to sale electricity to local consumers then remaining sale to NEA. So, BPC is not necessary to make comprehensive sales and production

budgets. From the power loss situation BPC is not reach the targeted sales. However, BPC get success to earn profit because the good management of the company. The major findings of the study on the basis of collected and analysis of data are presented as below:-

1. BPC's sales budget is fixed or stable and sales budget and sales performance is satisfactory.
2. The sales achievement percent of amount is 79.2 percent, 95.0 percent, 84.54 percent, 84.69 percent and 96.9 percent in FY 2058/59, 2059/60, 2060/61, 2061/62 and 2062/63 respectively. The achievement percentage of sales revenue is fluctuating during the study period. BPC did not get achieve the targeted sales due to the leakage and power loss situation.
3. There is positive and perfect correlation between budgeted and actual sales. It means actual sales change in same direction with budgeted sales.
4. BPC's actual sale is increasing trend during study period besides FY 2059/60. It was Rs.236279, Rs.96364, Rs.283167, Rs.323134 and Rs.358419 in thousand in FY 2058/59, 2059/60, 2060/61, 2061/62 and 2062/63 respectively. Due to the Maoist attack on Jhimruk Hydropower Plant in FY 2059/60 was decrease the sales.
5. From the analysis of chapter IV it can conclude that in every year more space is occupying by other sources rather than electricity and consultancy services sources. In FY 2060/61 is displaying very high space on total income of company by other sources rather than electricity and consultancy

services sources due to dividend received from extra investment in other sectors. In the same way this category captures its impact on other next years as before in the generation of total income of the company.

6. Amount of expenditure of BPC is fluctuating during the study period. It was Rs.152619, Rs.153088, Rs.279371, Rs.197459 and Rs.201822 in thousand in FY 2058/59, 2059/60, 2060/61, 2061/62 and 2062/63 respectively
7. Administrative expenses is fluctuating trend. The administrative expenses was Rs.15249, Rs.25066, Rs.38371, Rs.41201 and Rs.36438 in FY2058/59, 2059/60, 2060/61, 2061/62 and 2062/62 respectively.
8. Amount of selling and distribution is in increasing trend but in FY 2059/60 and 2060/61 amount remains same.
9. The weight of power plant expenses in total expenditure are 26.1, 28.55, 16.96, 30.18 and 28.6 percent in FY 2058/59, 2059/60, 2060/61, 2061/62 and 2062/63 respectively.
10. The weight of consultancy services in total expenditure is 12.97, 9.8, 3.92, 7.55 and 6.78 percent respectively in FY 2058/59 to 2062/63.
11. The weight of other expenditure, in total expenditure is 31.49, 27.54, 55.67, 26.06 and 31.14 percent respectively in FY 2058/59 to 2062/63.
12. The original BEP is Rs. 138751 in thousand. If fixed cost is increase than decrease in net profit and increase in BEP, when decrease in variable cost than contribution margin and net profit is decrease and BEP is increase.

13. BPC' income sources are mainly electricity sale and other consultancy services, interest from deposit, gain on sale of assets and scrap materials etc.
14. The main expenditure of BPC is power point expenses, consultancy services, administrative expenses, loss on fixed assets, depreciation, staff bonus etc.
15. The income of BPC is fluctuating during the study period. Income was Rs. 281521, Rs.108144, Rs.531611, Rs.397712 and Rs.493710 in thousand in FY 2058/59, 2059/60, 2060/61, 2061/62 and 2062/63 respectively.
16. The expenditure of BPC was Rs.152619, Rs.153088, Rs.279371, Rs.197459 and Rs.201812 in thousand in FY 2058/59, 2059/60, 2060/61, 2061/62 and 2062/63 respectively. The expenditure is also fluctuating during the study period.
17. The coefficient of variation of income is 42.42percent, and expenditure is 23.50 percent and there is highly positive correlation between income and expenditure. It means expenditure change in same direction with income.
18. Net profit before tax was Rs.128902, Rs.252240, Rs.198253, Rs.291888 in thousand in FY 2058/59, 2060/61, 2061/62, 2062/63 respectively and in FY 2059/60 BPC had got loss Rs.44944 in thousand.
19. The coefficient of multiple correlations is between three variables income, expenditure and profit. The value of correlation shows that there is highly

positive correlation between income and expenditure with profit. It means profit is change same direction with income and expenditure.

20. BPC has running full capacity but the reason of power loss situation BPC did not have to meet sales planning.
21. BPC provides electricity to costumer in cheap price than NEA.
22. BPC prepared income statement systematically and net profit after tax was Rs.142626, Rs.235418, Rs.197761 and Rs.288419 in thousand in FY 2058/59, 2060/61, 2061/62, and 2062/63 in respectively. In FY 2059/60 had got loss Rs.44944 in thousand.

Recommendations Base on the above study, the following suggestions and recommendations are outlined to improve the formulation and implementation of profit planning and controlling system.

1. BPC should control the leakage of electricity to achievement the sales target.
2. Loss of the electricity should be controlled. Meter reading and meter joining system should be improved and transmission and distribution line should be refurbished and modernized to control the leakage.
3. BPC should prepared income and expenditure budget to present the actual financial condition of the company.
4. BPC should try to minimize its overall expenditure to maximize profit

5. BPC should clearly classify the costs as fixed, variable and semi-variable to assist to plan production and its operation.
6. BPC should maintain its periodic performance reports systematically and also should take correction action if necessary.
7. To increase the profit the sales of electricity to local consumer should extent rather than NEA. Because the selling price per unit of local consumer is higher than NEA.
8. The management should give training and take carrot and stick strategy for good performance.
9. To increase the production of electricity BPC should upgrade the Andhikhola hydropower.
10. It is suggested that BPC should invest in other hydro projects to increase the production and profit.
11. BPC should controlled the frequently line cut off used by new and modernized machine.
12. In BPC, planning should be communicated to lower level management and coordination among them should be established.

2.4 Review of Articles

Mr. Prachar Pradhan,

Mr. Prachar Pradhan has study on ***"Challenges and issue on the domestic hydropower projects"***. Published on Vidyut magazine Bhadra 2064. In this study Mr. Pradhan has pointed out following major issue, challenge and conclusion that.

The electricity tariff in Nepal is high, and is beyond the affordable capacity of many of the consumers. The reasons are manifold. The basic infrastructure is not well developed often includes infrastructures such as long approach roads, transmission lines and so on. The majority of equipment and materials also have to be imported, which requires foreign currency and transportation overland for a long distance from the port. The major share of the financing is long distance from the port. The major share of the financing for the projects is from external loans and investments which are to be paid back in foreign currency escalate the tariff further. The challenges lie in developing cheap and reliable hydropower projects so as to keep the tariff within the reach of everyone. Nepal government is, therefore, undertaking power sector reform measures with a view to bring about improvements to remedy the situation.

It is encouraging to note that the private sector is gradually entering the power market. The local banking sector's interest in forming consortiums with private developers as in the case of the piluwa, indrawati, sano sunkoshi and khudi projects also heralds a new dawn on the horizon despite present security situation.

The main challenge to the private sector is the transfer of technical know how and easy access to the international markets for financing mechanisms.

The domestic demand over the forecast period of 25 years is relatively small, limiting many developments. The challenge lies in the ability to establish a number of energy intensive industries and transport system within the country for creating a greater demand for hydroelectricity, which will lead to a higher energy growth rate than the load forecast. A break-through along this line will provide ample opportunities for development of this clean and renewable energy.

Nepal own resources both in the public and private sector cannot meet the financial investment needed for hydropower development. A large investment is required from foreign development agencies and private sector entrepreneurs. Although significant foreign investment has been attracted in recent years, much still remains to be invested for meeting both internal demand and the significant potential for the export of power.

Conclusion

Nepal with its tremendous potential of hydropower, has not been able to get rid of chronic problem of load shedding during winter whereas excess energy during summer seasons. This situation will be eradicated, if Nepal power system is synchronized with the Indian power system. The recent agreement between NEA

and IL & FS for development of Nepal-India high voltage power interconnections will be milestone.

More generation projects on joint venture mode of public private partnership to be developed, so as to justify the high voltage interconnection between Nepal and India.

In the medium\ long term scenario Nepal should focus on meeting India's Hydro generation targets around, 50,000 MW needed by 2011-12 via, displacement of capacity 5000 MW to 10,000MW from large scale hydropower projects in Nepal.

2.5 Research Gap

The study doesn't find any research about the particular topic i.e. "Capital Budgeting of Hydroelectric Project with reference to Chilime Hydropower Project". Over all studies mentioned about the profit planning & control, Revenue planning in Nepal & Cost Volume Profit Analysis. They are basically related to Nepalese Public Enterprises (NEA, NTC & RDL). Those studies have pointed the similar findings and conclusions. This study tries to find Long-term capital investment in hydropower project. Therefore, this study is designated to Capital investment decision of CHP project.

CHAPTER- III

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a way of systematic and objective analysis and recording controlled observation that may lead to the development of generalizations principles or theories resulting in the prediction and possibly ultimate control events, the main purpose of this research is to analyze, examine and interpret the capital budgeting techniques. This study has intense relation with the application of capital budgeting and control in Chilime hydropower Project. The research methodology is followed to achieve the basic objectives and goals of this research work.

This section deals with the research design, period covered, the nature and sources of data used and research variables.

3.2 Research Design

Research design is the plan, structure, and strategy of investigation conceived so as to obtain answer to research question and to control variance. The plan is the overall schemed or program of the research like the structure of research is more specific. It is the out line, the scheme, the paradigm of the operation of the variable and strategy implies how the research objective will be reached and how the

problem encountered in the research will be tackled. Research design is an analytical as well as descriptive approach to achieve the objective. Thus research design is a plan to obtain the answer of research questions through analysis of data.

This study is manly focus on historical research design of CHPCL. Historical research is concerned with the past phenomena. It is a process of collecting evaluating, verifying and synthesizing past evidence systematically and objectively to reach a conclusion. Historical research may also attempt to discern trends in the past and reconstruct the origin and development of those events. The main purpose of conducting historical research is to show the relevance of past event to the present.

Accuracy of gathered information is the main ingredient of success in historical research. There are two main sources from where past evidences can be found. One is the primary source, where the researcher was a direct observer of the recorded event and the other is the secondary source, where he or she is reporting the observations of others. In most cases, the researcher has to depend upon the data observed by others rather than by him or herself. At the same time, the researcher must also be aware that inappropriate and biased information results in faulty conclusion and findings.

Historical research is unique among he various types of research in that the source of data being studied are usually not available for the researcher's direct scrutiny. The researcher bears a special burden of impartial interpretation. Furthermore, the researcher must be sure that he or she understands the perspective of the sources of information.

3.3 Period Covered

The study period cover the time period of fifty years from FY 2053/054 to 2103/04 for the purpose of long term profit planning control and analysis data are taken from CHPCL. Which are assumed to be corrected and true?

3.4 Nature and Source of Data

In this study, both primary and secondary source of data will be used to fulfill the objectives. But mostly secondary data has been used. The data have been collected from Published and unpublished articles and studies.

3.5 Method of analysis:

The data collection and arranged in proper from have been analyzed and interpreted through budgetary approach, financial tools and techniques are used. They are:

3.5.1 Financials tools

Financials tools which are used to measure the financial performance of the concern from long term as well as short term solvency point of view are called

financial tools. There are wide range of financial tools that can be used in analyzing the performance and financial soundness of the organization. In this field work study, mainly following tools are used to measure the efficiency of CHPCL.

Estimating the project's net cash flow

Cash flow generally indicates a cash inflow and a cash outflow. The key point in investment analysis is to focus exclusively on the differences in expected future cash flows that result from implementing a project. All cash flows are treated as the same whether they arise from operations, purchase or sale of equipment or investment in or recovery of working capital. The opportunity cost and the time value of money are tied to the cash flowing in or out of the organization and not to the source of the cash.

I. Procedures of Cash Flow Estimation

According to concept of capital budgeting, first of all, it is necessary to estimate the cash flow in the process of analysis investment proposal. While analyzing the cash flow, it is also necessary to estimate the outflow as well as inflow. After the cash flow estimation, it can be finalized about investment. The following three steps are involving cash flow estimation:

Step 1: determination of net investment or initial cash outlay or net cash outlay.

Step 2: Determination of annual net cash flow or cash flow after tax.

Step 3: Determination of net cash flow for the final year.

II. Payback Period (PBP)

The payback period method is the traditional method of capital budgeting. It is the simplest and perhaps the most widely employed quantitative method for appraising capital expenditure decisions. This method answers the questions: how many years will it take for the cash benefit to pay the original cost of an investment?

II. Accounting Rate of Return

The accounting rate of return refers to the earning or net profit after tax. It is consider net earning instead of net cash flows. It is called the accounting rate of return because it evaluates the purpose on the basis of net profit determined financial account. It is also known as average rate of return.

IV. Net present value

The net present value (NPV) method is a discounted cash flow approach to capital budgeting that discounts all expected future cash flows to the present using a minimal desired rate of return. To apply the net present value (NPV) method to proposed investment proposal a manager first determines some minimum desired rate of return. The minimum rate is called the required rate of return, hurdle rate, discount rate or cost of capital. Then all expected cash flows from the project are discounted to the present, using this minimum desired rate. If the sum of the present values of the cash flow is zero, or positive, the project is desirable and if

negative it is undesirable. When choosing from among several investments, the one with the largest net present value is the most desirable.

Method of finding CFAT & NPV under Formula Method (Shamvab Model)

Calculation of CFAT formula method is developed by this thesis researcher, consulting with lecturer of Shanker Dev College Mr. Shanker Raj Joshi. It is a technique used for evaluation and analysis CFAT and NPV for a long term project. It is technique which helps the researcher, manager & others to minimizing effort and time. It can be applied an individual year or large no of years.

Main features of this technique

- In this method can't require table like classical method.
- It is gives same result to gives like classical method.
- To calculation of deprecation in dollar is not required. ie. it is can applied like MACRS class life depreciation method.
- It can be calculation of a particular year CFAT if project are used WDV depreciation method. {To find the percent of yearly deprecation used that formula: $(1- \text{Dep. }\%)^{n-1}$ }

WDV Depreciation Formula,

Yearly percentage of Dep. (WDV) = $(1- \text{Dep. \%})^{n-1}$

Where,

Dep.% = Given Dep.

n = Number of required yea

If Dep. rate for a first year = 25 %

What is rate of Deprecation in year 15?

Calculation,

Dep. Rate in 25 year = $(1- 25\ \%)^{15\ -\ 1}$

In year 15 the rate of dep. is = 1.78179%

Summary of steps in the Formula Method

Step in the Formula Method to find CFAT & NPV

Step 1: first identification Net Cash Outlay of projects.

Step 2: To find yearly Deprecation (if WDV method of dep. used that formula, yearly Dep. Percent (WDV Method) = $(1- \text{Dep. \%})^{n-1}$

Step 3: To find EBDT on investment. Step 4: To find percentage Ratio of CFAT on EBDT (use formula).

Step 5: To calculation CFAT, Multiplying by Ratio of CFAT on EBDT.

Step 6: To converted present value step 5 amounts by appropriated rate.

Step 7: To find NPV subtracted step 5 total value by step 1.

V. Profitability Index (PI)

Profitability index may be defined as the ratio of the present value of the future cash flows to the initial outlay. NPV and PI method provide us with the same accept reject decision.

VI. Internal Rate of Return (IRR)

The IRR is the interest rate that equates the present value of the expected future cash flows or receipts to the initial outlay. The IRR formula is the same as the NPV formula, except is sets the NPV equal to zero and solves for the discount rate. If the IRR is greater then cost of capital, the value of the firm increase and the project should be accepted.

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The main purpose of this study is to analyses the Capital Budgeting in the context of Chilime Hydropower Project. This chapter is trying to analyze the Capital Budgeting Decision of Chilime Hydropower Project.

Capital budgeting is one of the most powerful tools of profit planning and control. The term capital refers to long term assets used in production, while a budget is a plan which details projected inflows and outflows during some future period. So, the capital budget is a planned expenditure on long term assets, and capital budgeting is process of evaluating and selecting long term investments.

Capital budgeting may be define as the decision making process by which firms evaluate the purchase of major fixed assets, including buildings, machinery, and equipment. Capital budgeting describes the firm's formal planning process for the acquisition and investment of capital and result in a capital budget that is the firm's formal plan for the expenditure of money to purchase fixed assets.

The main objective of this study as mentioned in the introduction chapter to evaluate investment worth, planning the future cash flow and decided the Chilime Hydropower project investment. The study mainly focused on long-term capital budgeting decision for this purpose, the study covers 50 years from 2060/2061 to 2110/2111. Here, in this research various sort of data are presented and analyzed some recommendation also has been pointed.

4.2 Cash Flow Estimation

Cash flow is a process of income and expenditure of a certain investment. A series of income and expenditure over the life of investment project is known as cash flow stream. Cash flow is of two types, they are inflow and outflow. Income, increase on an income and saving on expenditure are cash flows. Expenditure, increase on an expenditure, investment are cash outflows.

Estimation of the net cash flows in an investment CHP Project should cover.

- The initial investment costs of CHPP.
- The cash flows over the running life of the project
- Terminal cash flows at the end of the project.

Table 4.1

Detail Project information

Cost of Project Till FY 2060/061	Rs.2,505,257,521
Useful Life Of CHP Project	50 Years.
Estimated Salvage Value	Nil
Tax Rate	20% Per Annum (After15Years)
Deprecation Rate (WDV Method)	Under taken into Gov. Rule.(tax act 058)
Cost Of Capital	7.75%
Working Capital	Rs.27,363,000
Average Capacity per annum.	137,000,000 unit

4.3 Determination of Earning Before Depreciation and Tax (EBDT)

The next step, after estimation of net cash outlay of an investment proposal is to estimate the EBDT during life of project. To determine the EBDT, the following table can be used.

Formula,

EBDT per unit = Selling price per unit — Average unit cost per unit

Table 4.2

Earning Before Depreciation and Tax

years	Rate\per unit	avg./unit Cost	EBDT/Unit	Yearly EBDT
2060/2061	4.7556	0.583897862	4.171702138	571523192.9
2061/2062	5.1360	0.612587939	4.523460061	619714028.4
2062/2063	5.5469	0.952496532	4.594435308	629437637.2
2063/2064	5.9907	0.629910282	5.360776105	734426326.4
2064/2065	6.4699	0.661405796	5.808535502	795769363.8
2065/2066	6.4699	0.694476086	5.775464914	791238693.2
2066/2067	6.4699	0.729199890	5.740741110	786481532.1
2067/2068	6.4699	0.765659885	5.704281115	781486512.8
2068/2069	6.4699	0.803942879	5.665998121	776241742.6
2069/2070	6.8581	0.844140023	6.013997437	823917648.9
2070/2071	7.2696	0.886347024	6.383278684	874509179.7
2071/2072	7.7058	0.930664375	6.775138875	928194025.9
2072/2073	8.1700	0.977197594	7.192802406	985413929.6
2073 -2109**	8.1700	0.977197594	7.192802406	985413929.6

Source: Annual Report of CHPCL & Estimation. (Details see in Appendix-v)

Note:-** Assume FY 2073 to 2109/21010years has been even EBDT.

4.4 Finding the Annual Depreciation

The word ‘deprecation’ has been derived from the Latin word ‘depretium’ where de means decline, and pretium means price. Hence depreciation means decrease in the value of fixed or capital assets. It represents permanent, continuing and gradual shrinkage in the book value of a fixed asset. According to J.H. Burton

"depreciation is the shrinkage in the value of asset at a given date as compared with its value at a previous date".

Deprecation Allowance (Nepal Tax Act. 2058 sec 19)

- Depreciation is the depletion in the value of assets by wear and tear, obsolescence, or the passing of time.
- Deprecation at prescribed rate is allowed on used depreciable assets owned by the person.
- The block wise details and rate of depreciation are given in the following table:

Table 4.3

Deprecation Rate Table

Block	**Particulars of assets**	**Rate of Dep.%**
A	Building, structures, and similar works of a permanent nature	5%
B	Computer, data processing equipments, furniture, fixtures and office equipments	25%
C	Automobiles, Bus and Mini Bus	20%
D	Construction and earth moving equipments, portion of pollution control cost and research and Development cost and any tangible assets not included in above blocks (Plant and Machinery, etc)	15%
E	Intangible assets other than not included in block 'D' (Patent, Design, Software, etc)	Original cost / Useful life

Source: Tax Act, 2058

- Computation of allowable Depreciation and closing depreciation base of assets for the year

Table 4.4

Calculation WDV

Opening WDV (Opening Dep. Base)	×××
Add:- Absorbed addition of asset (purchased)	×××
	×××
Less:- Disposal during the year	(×××)
Depreciation base for the year	×××
Less Depreciation	(×××)
Balance after Depreciation	×××
Closing WDV (Opening Dep. base for the next year	×××

Source: Tax Act, 2058

Calculation Yearly Depreciation Percentage under WDV Method

Formula, Yearly Dep. Percent = $(1- \text{Dep. \%})^{n-1}$

Where,

Dep. % = given %

n = number of required year

(Detail sees in Appendix-I page no 90)

- Deprecation = Depreciation Rate applicable to that Block X Depreciation basis
- These under noted entities are allowed an additional depreciation of ⅓ of the rate of prescribed on the assets falling under Blocks A,B,C & D:
  1. Entity engaged in building public infrastructure to transfer to HMG and any other entity engaged in power generation transmission or distribution of electricity.
  2. Entity wholly engaged in operating special industry.

3. Entity wholly engaged in operating road, bridge, tunnel, ropeway or flying bridge constructed by the entity.
4. Entity wholly engaged in operating trolley bus or trams.
5. Entity that earned income from export in and income year.

- If the block balance after depreciation during an income year comes less then Rs. 2000, the whole amount is allowed as expenses during the income year.

4.5 Net Present Value (NPV)

As the flaws in the payback and ARR methods were recognized, people began to search for methods of evaluating projects that would recognize that a rupees received immediately is preferable to a rupees received at some future date. This recognition led to the development of discounted cash flow (DCF) techniques to take account of the time value of money. One such discounted cash flow technique is called the net present value method. To implement this approach, find the present value of the expected net cash flows of an investment, discounted at the cost of capital, the subtract from it the initial cost outlay of the project. If the net present value is positive, the project should be accepted; if negative, it should be rejected. If two projects are mutually exclusive, the one with the higher net present value should be chosen.

NPV Decision Rule

The research shows that, the procedures in calculating the net present value we use the data for project CHP. We multiply the cash flow for each year by the

appropriate discount factor (PVIF), assuming cost of capital, k, is 7.75 percent. The procedures are illustrated in Appendix-II (page no 91). The net present Value of project CHP is Rs. 7,252,411, 465.70.Chilime hydropower project has a positive NPV and therefore, according to the decision rule, the project CHP is a worthwhile undertaking.

4.6 Payback period (PBP)

Chilime Hydropower project spends Rs.2, 505,257,521 until year FY 2060/061. Then for each year we will get money back as shown below.

Table 4.5

Payback Period

Year	Cash flow Rs.	Total Rs.
2053- 2060		-2505257521.0
2060/2061	571523192.9	-1933734328.1
2061/2062	619714028.4	-1314020299.7
2062/2063	629437637.2	-684582662.5
2063/2064	734426326.4	

Source: - Appendix -II

$$\text{PBP= Minimum year} + \frac{\text{Amount to Recover}}{\text{Cash flow during the year}}$$

$$= 9 + \frac{684582662.5}{734426326.4}$$

= 9.9321 Years

PBP Decision Rule

The pay back method requires a benchmark above which you reject investments and below which you accept them. Managers simply state the acceptable limit to the payback period; however this benchmark payback period is objective. Some companies require a payback period criterion matches with the NPV criterion.

The payback period can be used as a decision criterion to accept or reject investment proposals. One application of this technique is to compare the annual payback with a predetermined payback i.e. the payback set up by the management in terms of the maximum period during which initial investment must be recovered. If the actual payback period is less then the pre determined payback, the project will be rejected. Alternatively, the payback can be used as a ranking method. When mutually exclusive projects are under consideration, they may be ranked according to the length of the payback period.

Therefore, the number of the years required to recover the initial investment of Chilime Hydropower project is 9.9321 Years

Discount Payback Period: (DPP)

DPP is the number of years required for the sum of the cash flows discounted at k, the cost of capital, to equal the present value of the initial outlay. We can use the data for project CHP to illustrate its computation:

Table 4.6

Discount Payback Period

Year (1)	Annual CFAT (2)	Disc. Rate (3)	NPV in Rs. 4 = (2 X 3)	Total in Rs.
2053 - 2060	-2505257521	1.00000000	-2505257521	-2505257521
2060/2061	571523192.9	0.92807425	530415956	-1974841565
2061/2062	619714028.4	0.86132181	533773206	-1441068359
2062/2063	629437637.2	0.79937059	503153933	-937914426
2063/2064	734426326.4	0.74187525	544852717	-393061709
2064/2065	795769363.8	0.68851532	547899395	

Source: - Appendix - II

$$\text{PBP= Minimum year} + \frac{\text{Amount to Recover}}{\text{Cash flow during the year}}$$

$$= 10 + \frac{393061709}{547899395}$$

= 10.7174 Years

The CHP project has discounted cash inflows equal the initial investment outlay during the 10.7174 years. The discounted cash payback method does take the time value of money into account. However, it still suffers for the weakness that it does not consider all cash flows.

4.7 Average Rate of Return (ARR)

The average rate of return is also called the accounting rate of return. It is the ratio of net income (NI) to the average investment outlay. It is computed by averaging

the income after tax over the life of a project and then dividing the average annual cash flow by the initial investment outlay. (Sees page 93 & 94)

$$\text{Average rate of return} = \frac{\text{Average net income after tax}}{\text{Initial outlay}}$$

Decision

The Chilime Hydropower project has 28.2044 % Accounting Rate of Return. It is grater than minimum required rate of return (7.75%), the project should be accepted under ARR method. The ARR does not take the time value of money into account. The ARR measure is related to the return on equity measure widely reported in business and government publications.

4.8 Internal Rate of Return (IRR)

The internal rate of return (IRR) is defined as the interest rate that equates the present value of the expected future cash flows, or receipts, to the initial cost outlay. The equation for calculating the internal rate of return is

Formula,

$$\frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \ldots\ldots\ldots\ldots\ldots + \frac{CFn}{(1+IRR)^{n1}} - I_0 = 0$$

$$\text{IRR}: \sum_{t=0}^{n} \frac{CF_t}{(1+IRR)^t} - I_0 = 0$$

Here I_0 and also the values of CF_1, CF_2 …….CFn but we do not know the value of IRR. Thus, we have an equation with one unknown, and we can solve for the value of IRR. Some value of IRR will cause the sum of the discounted receipts to equal the initial cost of the project, making the equation equal to zero. And that value of IRR is the internal rate of return.

Appendix- IV (page no 95) shows computations for the IRR of project CHP. The NPV of the project CHP cash flows decrease as the discount rate is increased. If the discount rate is zero, there is no time value of money and the NPV of a project is simply the sum of its cash flows. For project CHP, the NPV equals Rs.39857678868.4, when the discount rate is zero. At the opposite extreme, if the discount rate is infinite, then the future cash flows are valueless and the NPV of project CHP is its current cash flow (2053 to 2060) is –Rs.2, 505,257,521. Somewhere between these two extremes is a discount rate which makes the NPV equal to zero. Try Discount Rate at 28%, NPV is Negative. So, try at lower rate 27.778% NPV is Positive. The IRR of project CHP has27.777986%, if we use the IRR criterion and the projects are independent, we accept any project which has an IRR grater than the opportunity cost of capital, which is 7.75%. Therefore, CHPCL decision is batter decision according to IRR Decision Rule.

4.9 Profitability Index (PI)

The profitability index (PI) or benefit cost ratio is a time-adjusted capital budgeting technique. It is similar to the NPV approach. The PI approach measures he present value of return per rupee invested, while the NPV is based on the difference between the present value of future cash inflows and the present value of cash outlays. Profitability index may be defined as a ratio, which is obtained by dividing the present value of future cash inflows by the present value of cash outlays. The following illustration indicated project CHP profitability index ratio.

Mathematically,

$$PI = \frac{\text{present value of cash inflow}}{\text{present value of cash out flow}}$$

$$= \frac{9757668986.70}{2505257521}$$

= 3.8948 Times

(Details sees Appendix-II)

PI decision rule

If the PI value exceeds one, the proposal is worth accepting. When profitability indeed equals one (1), the firm is indifferent to the projects. When the profitability index is greater, equal to, or less than one, the net present value is greater, equal or less then zero respectively. In other words, NPV will be positive when the profitability index is greater than one; and will be negative when the profitability

index is less than one. Thus, the NPV and profitability index approaches give the same results regarding the investments proposals.

Chilime hydropower project profitability index has greater than one; the project should be accepted. The NPV and profitability index approaches gives the same result regarding the investment proposals.

4.10 COST Ratio

Per Unit Electricity Structure cost (PUES): - that cost is calculating dividing total cost by average number of unit production yearly.

$$\text{PUES} = \frac{2505257521}{137000000\ \text{Unit}}$$

= Rs.18.2865/ unit

Or per MW Structure cost,

$$= \frac{2505257521}{20\,MW}$$

=Rs.125,262,876.1

4.11 Major Findings

On the basis of comprehensive analysis of the data, observation and informal discussion, the following major finding have been drawn.

1. The Net Present Value (NPV) of project Chilime hydropower has positive Rs.7,252,411, 465.70 with 7.75% discount rate.
2. The number of the years required to recover the initial investment is 3.9321 years after commercial operation of CHP project. But it taken 9.9321 years to recover the investment after to built.
3. The CHP project has discounted cash inflows equal the initial investment outlay during 10.7174 years taken after establishment time.
4. The Chilime Hydropower project has 28.20 % Accounting Rate of Return.
5. The Internal Rate of Return (IRR) of project CHP has 27.777986%.
6. The profitability index (PI) or benefit cost ratio project CHP has 3.8948 times.

CHAPTER- V

SUMMARY, CONCLUSION AND RECOMMEMDATIONS

5.1 Summary

Around 51.5% Nepalese peoples are facing load shedding all their life time periods (till FY 2006/2007) and rest of the Nepalese are also facing same problem partially. Nepal has huge theoretical hydropower potential of 83000 MW out of which technically feasible capacity is about 45000 MW and economically feasible capacity is about 43000 MW. There are mainly two markets for power generated under Nepal's hydropower development programmed i.e. Domestic demand and India's power market. However, supply to cater domestic demand is the highest priority and efforts to take advantage of market opportunities for power export to India need to be undertaken by Nepal. From the above statement, there is a potential opportunity for Nepal to become a major power exporter to India and at the same time earns revenue from power sales to help develop Nepal's own domestic economy.

Capital budgeting decisions are involved with the use of cash now and get back the investment over a period longer than a year. Evaluating such decisions requires determining the investment and its resulting cash flows. Investments provide future cash flows through additional revenues and costs, and through cost saving

critical to capital budgeting is that most, if not all, of the numbers used in the analyses are estimates. Deprecation, a non-cash expense, affects income taxes and must therefore be recognized.

The company's circumstances in terms of available funds and investment opportunities should be considered before selecting a single capital budgeting technique for general use. Capital investments must earn returns on both working capital and plant investments. Investments that reduce inventories are especially desirable because the payoff is very high. Capital budgeting decisions involve many estimates, so managers perform sensitivity analysis to alert themselves to areas where they might face problems.

Capital budgeting decision requires recognizing the time value of money. The two most popular approaches, called discounted cash flow techniques, are the net present value (NPV) and the internal rate of return (IRR) methods. The traditional methods-payback and accounting rate of return are often used, but are conceptually inferior because they fail to consider the time value of money. Yet, such methods, particularly payback, might be useful as rough screening devices. The source of financing a particular investment is not considered in it.

Risk is only one condition a decision maker may face. Uncertainty and risk describe the conditions most financial managers face. Probability and statistics

provide useful methods for describing such situations. If only one outcome is possible, the situation can be described as certainty. If more than one outcome is possible but the probabilities of these states of nature are unknown, decisions are made under conditions of uncertainty. Different decisions rules are followed in each decision situation. Decision making under risk is different from decision making that considers the degree of risk or uncertainty.

This research paper tried to examine the Chilime hydropower project investment is feasible or not? Form the purpose of analyzing long term budgets data from 2060/2061 to 2109/2110 have been taken. This data have been analyzed with the help of various financial tools. Data have been collected from secondary source and informant ion from primary sources. The main objective of this study is to find out Chilime hydropower project capital investment decision better or not? After analyze the data are say that, the past Chilime Hydropower Company Limited long-term Investment Decision is batter decision.

From the study (questionnaire) it was show that, the Chilime Hydropower Company was practice net present value (NPV), Pay Back Period and IRR to make long-term-investment decision. But CHPC not able to provide the previous Capital Budgeting practiced data.

Related literatures have been review which consists about books, reports, periodic articles and government official publication. A General concept of capital budgeting had been given in conceptual framework.

This study has been organized in five chapters consisting of introduction, conceptual framework and presentation and analyzing of data and summary, conclusion and recommendations.

5.2 Conclusion

In conclusion, Capital Budgeting decision of Chilime hydropower project is the following:

1. Chilime Hydropower Project has Positive Net Present Value (NPV) Rs.7, 252,411,465.70with 7.75% discount rate.
2. It has short time discount payback period nearly 4.7174 years after commercial operation.
3. The Chilime Hydropower project has 28.2044 % Accounting Rate of Return; it has grater than minimum required rate of return (7.75%).
4. The Internal Rate of Return (IRR) of project CHP has 27.777986%.
5. Chilime Hydropower Company previous decision should be acceptable.
6. The company should be controlled operating cost effectively.

5.3 Recommendations

In the light of the study following are the recommendation for the further managerial actions to the Chilime Hydropower Company.

- Chilime Hydropower project should be utilized all its available capacity which helps to increase its ales revenue by help of effective capacity management.
- Chilime Hydropower Company Should practiced Capital budgeting tools to make long-term-investment decision.
- Chilime Hydropower Company should practiced Tax Law and Tax Planning.
- Loss of the electricity should be controlled. Meter joining system should be improved and transmissions and distribution line should be refurbished and modernized to control the leakage.
- CHP project should maintain its periodic performance report systematically and variance analysis should be effective.
- CHPC should be invest such kind of projects and used all available resource properly.
- CHPC should try to minimize its overall expenditure to maximize profit.
- The management should give training and take carrot and stick strategy for good performance.
- To increase the production of electricity CHPC should upgrade the it project.

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APPENDIX-I

Deprecation Rate

FY	Block "A"	Dep.	Block "B"	Dep.	Block "C"	Dep.	Block "D"	Dep.	Total Dep.	Avg.D
60/2061	0.0667	158662587	0.3333	2656678	0.2667	7982744	0.2000	10854920	180156929	0.072
61/2062	0.0622	148085081	0.2222	1771118	0.1956	5854012.2	0.1600	8683936	164394148	0.066
62/2063	0.0581	138212742	0.1481	1180746	0.1434	4292942.3	0.1280	6947149	150633579	0.060
63/2064	0.0542	128998559	0.0988	787163.7	0.1052	3148157.7	0.1024	5557719	138491600	0.056
64/2065	0.0506	120398655	0.0658	524775.8	0.0771	2308649	0.0819	4446175	127678256	0.051
65/2066	0.0472	112372078	0.0439	349850.6	0.0566	1693009.2	0.0655	3556940	117971879	0.047
66/2067	0.0441	104880607	0.0293	233233.7	0.0415	1241540.1	0.0524	2845552	109200933	0.044
67/2068	0.0411	97888566.1	0.0195	155489.1	0.0304	910462.75	0.0419	2276442	101230960	0.040
68/2069	0.0384	91362661.7	0.0130	103659.4	0.0223	667672.68	0.0336	1821153	93955147.3	0.038
69/2070	0.0358	85271817.6	0.0087	69106.28	0.0164	489626.63	0.0268	1456923	87287473.3	0.035
70/2071	0.0334	79587029.8	0.0058	46070.85	0.0120	359059.53	0.0215	1165538	81157698.3	0.032
71/2072	0.0312	74281227.8	0.0039	30713.9	0.0088	263310.32	0.0172	932430.6	75507682.6	0.030
72/2073	0.0291	69329145.9	0.0026	20475.94	0.0065	193094.24	0.0137	745944.4	70288660.5	0.028
73/2074	0.0272	64707202.9	0.0017	13650.62	0.0047	141602.44	0.0110	596755.6	65459211.5	0.026
74/2075	0.0254	60393389.3	0.0011	9100.416	0.0035	103841.79	0.0088	477404.4	60983736	0.024
75/2076	0.0237	56367163.4	0.0008	6066.944	0.0025	76150.646	0.0070	381923.6	56831304.5	0.023
76/2077	0.0221	52609352.5	0.0005	4044.629	0.0019	55843.807	0.0056	305538.8	52974779.8	0.021

77/2078	0.0206	49102062.3	0.0003	2696.419	0.0014	40952.125	0.0045	244431.1	49390141.9	0.020
78/2079	0.0193	45828591.5	0.0002	5392.826	0.0010	30031.558	0.0036	195544.9	46059560.8	0.018
79/2080	0.0180	42773352.1	0.0002		0.0007	22023.143	0.0029	156435.9	42951811.1	0.017
80/2081	0.0168	39921795.3	0.0001		0.0005	16150.305	0.0023	125148.7	40063094.3	0.016
81/2082	0.0157	37260342.2	0.0001		0.0004	11843.557	0.0018	100119	37372304.8	0.015
82/2083	0.0146	34776319.4	0.0000		0.0003	8685.275	0.0015	80095.17	34865099.9	0.014
83/2084	0.0136	32457898.1	0.0000		0.0002	6369.2017	0.0012	64076.14	32528343.5	0.013
84/2085	0.0127	30294038.3	0.0000		0.0002	4670.7479	0.0009	51260.91	30349969.9	0.012
85/2086	0.0119	28274435.7	0.0000		0.0001	3425.2151	0.0008	41008.73	28318869.7	0.011
86/2087	0.0111	26389473.3	0.0000		0.0001	2511.8244	0.0006	32806.98	26424792.1	0.010
87/2088	0.0103	24630175.1	0.0000		0.0001	6907.5171	0.0005	26245.59	24663328.2	0.010
88/2089	0.0097	22988163.4	0.0000		0.0000		0.0004	20996.47	23009159.9	0.009
89/2090	0.0090	21455619.2	0.0000		0.0000		0.0003	16797.18	21472416.4	0.008
90/2091	0.0084	20025244.6	0.0000		0.0000		0.0002	13437.74	20038682.3	0.008
91/2092	0.0079	18690228.3	0.0000		0.0000		0.0002	10750.19	18700978.5	0.007
92/2093	0.0073	17444213.1	0.0000		0.0000		0.0002	8600.154	17452813.2	0.007
93/2094	0.0068	16281265.5	0.0000		0.0000		0.0001	6880.123	16288145.7	0.006
94/2095	0.0064	15195847.8	0.0000		0.0000		0.0001	5504.099	15201351.9	0.006
95/2096	0.0060	14182791.3	0.0000		0.0000		0.0001	4403.279	14187194.6	0.005
96/2097	0.0056	13237271.9	0.0000		0.0000		0.0001	3522.623	13240794.5	0.005
97/2098	0.0052	12354787.1	0.0000		0.0000		0.0001	2818.098	12357605.2	0.005

98/2099	0.0048	11531134.6	0.0000		0.0000		0.0000	2254.479	11533389.1	0.004
99/2100	0.0045	10762392.3	0.0000		0.0000		0.0000	9017.915	10771410.2	0.004
00/2101	0.0042	10044899.5	0.0000		0.0000		0.0000		10044899.5	0.004
01/2102	0.0039	9375239.52	0.0000		0.0000		0.0000		9375239.52	0.003
02/2103	0.0037	8750223.56	0.0000		0.0000		0.0000		8750223.56	0.003
03/2104	0.0034	8166875.32	0.0000		0.0000		0.0000		8166875.32	0.003
04/2105	0.0032	7622416.96	0.0000		0.0000		0.0000		7622416.96	0.003
05/2106	0.0030	7114255.83	0.0000		0.0000		0.0000		7114255.83	0.002
06/2107	0.0028	6639972.11	0.0000		0.0000		0.0000		6639972.11	0.002
07/2108	0.0026	6197307.3	0.0000		0.0000		0.0000		6197307.3	0.002
08/2109	0.0024	5784153.48	0.0000		0.0000		0.0000		5784153.48	0.002
09/2110	0.0023	5398543.25	0.0000		0.0000		0.0000		5398543.25	0.002
cover		2304359196		7970033		29935290		54274602	2396539121	0.969
undercover		75579605.5							75579605.5	0.030
al		2379938802							2472118726	

APPENDIX-II

CFAT & NPV

FY (1)	EBDT (2)	EBDT ON Dep. ASS (3)	Dep. Rate(4)	CFAT Ratio	Annual CFAT Rs.	Disc. Rat.@ 7.75%	NPV
2060/2061	571523192.9	0.23118760	0.07287552	1	571523192.9	0.92807425	530415956.29
2061/2062	619714028.4	0.25068134	0.06649929	1	619714028.4	0.86132181	533773206.13
2062/2063	629437637.2	0.25461465	0.06093299	1	629437637.2	0.79937059	503153932.64
2063/2064	734426326.4	0.29708376	0.05602142	1	734426326.4	0.74187525	544852717.04
2064/2065	795769363.8	0.32189771	0.05164730	1	795769363.8	0.68851532	547899395.32
2065/2066	791238693.2	0.32006501	0.04772096	1	791238693.2	0.63899333	505596249.85
2066/2067	786481532.1	0.31814068	0.04417301	1	786481532.1	0.59303326	466409703.60
2067/2068	781486512.8	0.31612014	0.04094907	1	781486512.8	0.55037889	430113680.78
2068/2069	776241742.6	0.31399857	0.03800592	1	776241742.6	0.51079247	396498440.81
2069/2070	823917648.9	0.33328401	0.03530877	1	823917648.9	0.47405334	390580914.13
2070/2071	874509179.7	0.35374886	0.03282921	1	874509179.7	0.43995670	384746170.15
2071/2072	928194025.9	0.37546499	0.03054371	1	928194025.9	0.40831248	378993204.41
2072/2073	985413929.6	0.39861109	0.02843256	1	985413929.6	0.37894430	373416988.57
2073/2074	985413929.6	0.39861109	0.02647899	1	985413929.6	0.35168844	346558690.09
2074/2075	985413929.6	0.39861109	0.02466861	1	985413929.6	0.32639299	321632194.98
2075/2076	985413929.6	0.39861109	0.02298891	0.81153450	799697404.6	0.30291692	242241878.26

2076/2077	985413929.6	0.39861109	0.02142890	0.81075178	798926099.6	0.28112940	224601612.00
2077/2078	985413929.6	0.39861109	0.01997887	0.81002424	798209172.1	0.26090895	208259918.88
2078/2079	985413929.6	0.39861109	0.01863161	0.80934827	797543055.8	0.24214288	193119371.87
2079/2080	985413929.6	0.39861109	0.01737449	0.80871752	796921505.9	0.22472657	179089436.64
2080/2081	985413929.6	0.39861109	0.01620598	0.80813122	796343762.5	0.20856294	166087798.01
2081/2082	985413929.6	0.39861109	0.01511752	0.80758510	795805604.6	0.19356190	154037641.03
2082/2083	985413929.6	0.39861109	0.01410333	0.80707623	795304163.7	0.17963981	142868288.78
2083/2084	985413929.6	0.39861109	0.01315808	0.80660197	794836812.4	0.16671908	132514463.01
2084/2085	985413929.6	0.39861109	0.01227691	0.80615984	794401137.7	0.15472769	122915849.39
2085/2086	985413929.6	0.39861109	0.01145530	0.80574761	793994917.6	0.14359878	114016701.53
2086/2087	985413929.6	0.39861109	0.01068913	0.80536319	793616102.1	0.13327033	105765479.43
2087/2088	985413929.6	0.39861109	0.00997660	0.80500568	793263809.3	0.12368476	98114644.32
2088/2089	985413929.6	0.39861109	0.00930747	0.80466995	792932975.7	0.11478864	91019698.60
2089/2090	985413929.6	0.39861109	0.00868584	0.80435805	792625627.0	0.10653238	84440295.55
2090/2091	985413929.6	0.39861109	0.00810587	0.80406706	792338880.1	0.09886996	78338512.98
2091/2092	985413929.6	0.39861109	0.00756476	0.80379556	792071339.4	0.09175866	72679407.18
2092/2093	985413929.6	0.39861109	0.00705986	0.80354223	791821706.3	0.08515885	67430627.55
2093/2094	985413929.6	0.39861109	0.00658874	0.80330585	791588772.8	0.07903374	62562219.21
2094/2095	985413929.6	0.39861109	0.00614912	0.80308527	791371414.1	0.07334918	58046441.33
2095/2096	985413929.6	0.39861109	0.00573888	0.80287944	791168582.6	0.06807348	53857599.82
2096/2097	985413929.6	0.39861109	0.00535605	0.80268736	790979302.6	0.06317724	49971893.15

2097/2098	985413929.6	0.39861109	0.00499879	0.80250810	790802664.7	0.05863317	46367270.22
2098/2099	985413929.6	0.39861109	0.00466539	0.80234082	790637821.5	0.05441594	43023299.25
2099/2100	985413929.6	0.39861109	0.00435716	0.80218617	790485425.7	0.05050203	39921119.71
2100/2101	985413929.6	0.39861109	0.00406328	0.80203872	790340123.6	0.04686963	37042952.81
2101/2102	985413929.6	0.39861109	0.00379239	0.80190280	790206191.6	0.04349850	34372784.66
2102/2103	985413929.6	0.39861109	0.00353956	0.80177595	790081188.4	0.04036984	31895449.84
2103/2104	985413929.6	0.39861109	0.00330359	0.80165755	789964518.7	0.03746621	29596974.39
2104/2105	985413929.6	0.39861109	0.00308335	0.80154705	789855627.1	0.03477142	27464403.37
2105/2106	985413929.6	0.39861109	0.00287780	0.80144391	789753994.8	0.03227046	25485725.73
2106/2107	985413929.6	0.39861109	0.00268594	0.80134765	789659138.1	0.02994938	23649804.79
2107/2108	985413929.6	0.39861109	0.00250688	0.80125781	789570605.1	0.02779525	21946313.95
2108/2109	985413929.6	0.39861109	0.00233976	0.80117395	789487974.4	0.02579606	20365677.22
2109/2110	985413929.6	0.39861109	0.00218377	0.80109569	789410852.3	0.02394066	18899014.18
Fin.Y.CFAT					42478921.1	0.02394066	1016973.27
						Total NPV	9757668986.70
						Net Outlay	2505257521.00
						NPV	7252411465.70

Source:- Annual Report of CHPCL and Estimation

Note: Final year uncover depreciation Block “A” is Rs. 75579605.5. It is save @20% amount which is Rs.15, 115,921.1 & working capital release Rs.27363000. so final year without regular CFAT is Rs.42, 478921.1

Used that formula to calculated CFAT Ratio,

Percentage ratio of CFAT on EBDT= $1-[1-\frac{\text{Deprecation Rate}}{\%\text{EBDT on Depreciable assect}}] \times$ Tax Rate

APPENDIX-III

Average Net Income

FY (1)	EBDT	Dep.	EBT	Tax @20%	EAT
2060/2061	571523193	180156928.7	391366264	78273252.83	313093011.337
2061/2062	619714028	164394147.9	455319880	91063976.09	364255904.368
2062/2063	629437637	150633579.2	478804058	95760811.60	383043246.388
2063/2064	734426326	138491600.1	595934726	119186945.26	476747781.035
2064/2065	795769364	127678255.7	668091108	133618221.63	534472886.506
2065/2066	791238693	117971878.6	673266815	134653362.93	538613451.713
2066/2067	786481532	109200932.6	677280599	135456119.90	541824479.585
2067/2068	781486513	101230959.8	680255553	136051110.60	544204442.398
2068/2069	776241743	93955147.3	682286595	136457319.07	545829276.274
2069/2070	823917649	87287473.3	736630176	147326035.13	589304140.507
2070/2071	874509180	81157698.3	793351481	158670296.27	634681185.082
2071/2072	928194026	75507682.6	852686343	170537268.67	682149074.669
2072/2073	985413930	70288660.5	915125269	183025053.81	732100215.243
2073/2074	985413930	65459211.5	919954718	183990943.62	735963774.490
2074/2075	985413930	60983736.0	924430194	184886038.72	739544154.886
2075/2076	985413930	56831304.5	928582625	185716525.01	742866100.055
2076/2077	985413930	52974779.8	932439150	186487829.97	745951319.860
2077/2078	985413930	49390141.9	936023788	187204757.53	748819030.122

2078/2079	985413930	46059560.8	939354369	187870873.77	751483495.080
2079/2080	985413930	42951811.1	942462118	188492423.70	753969694.798
2080/2081	985413930	40063094.3	945350835	189070167.06	756280668.254
2081/2082	985413930	37372304.8	948041625	189608324.97	758433299.860
2082/2083	985413930	34865099.9	950548830	190109765.94	760439063.774
2083/2084	985413930	32528343.5	952885586	190577117.22	762308468.897
2084/2085	985413930	30349969.9	955063960	191012791.94	764051167.743
2085/2086	985413930	28318869.7	957095060	191419011.99	765676047.956
2086/2087	985413930	26424792.1	958989137	191797827.49	767191309.970
2087/2088	985413930	24663328.2	960750601	192150120.28	768600481.111
2088/2089	985413930	23009159.9	962404770	192480953.94	769923815.757
2089/2090	985413930	21472416.4	963941513	192788302.64	771153210.575
2090/2091	985413930	20038682.3	965375247	193075049.45	772300197.815
2091/2092	985413930	18700978.5	966712951	193342590.22	773370360.898
2092/2093	985413930	17452813.2	967961116	193592223.28	774368893.104
2093/2094	985413930	16288145.7	969125784	193825156.79	775300627.159
2094/2095	985413930	15201351.9	970212578	194042515.53	776170062.140
2095/2096	985413930	14187194.6	971226735	194245347.00	776981388.013
2096/2097	985413930	13240794.5	972173135	194434627.02	777738508.074
2097/2098	985413930	12357605.2	973056324	194611264.88	778445059.527
2098/2099	985413930	11533389.1	973880541	194776108.10	779104432.401

2099/2100	985413930	10771410.2	974642519	194928503.87	779714015.499
2100/2101	985413930	10044899.5	975369030	195073806.02	780295224.087
2101/2102	985413930	9375239.5	976038690	195207738.02	780830952.060
2102/2103	985413930	8750223.6	976663706	195332741.21	781330964.835
2103/2104	985413930	8166875.3	977247054	195449410.86	781797643.425
2104/2105	985413930	7622417.0	977791513	195558302.53	782233210.108
2105/2106	985413930	7114255.8	978299674	195659934.75	782639739.013
2106/2107	985413930	6639972.1	978773957	195754791.50	783019165.991
2107/2108	985413930	6197307.3	979216622	195843324.46	783373297.837
2108/2109	985413930	5784153.5	979629776	195925955.22	783703820.893
2109/2110	985413930	5398543.3	980015386	196003077.27	784012309.079
				Grand total	35329704070.251
				Average income. after tax	706594081.405
				ARR*	0.282

Source: - Annual Report of CHPCL, Estimation & Calculation

Calculation Average Income after tax to divided total earning after tax by number of years.

$$\text{Average rate of return} = \frac{\text{Average net income after tax}}{\text{Initial outlay}}$$

Where,

Average income = Rs.706594081.405

Initial Outlay = Rs.2505257521

Average rate of return = $\frac{706594081.405}{2505257521}$

ARR**= 28.2044%

APPENDIX-IV

IRR for Project

FY (1)	Annual CFAT Rs.	Disc. Rate@28%	PV	Disc.@2778%	PV	Disc.@27778	PV
060/2061	571523193	0.781250	446502494	0.78260	447271241.9	0.782601	447274742.
061/2062	619714028	0.610352	378243426	0.61246	379546997.1	0.612465	379552937.
062/2063	629437637	0.476837	300139254	0.47930	301692182.3	0.479316	301699265.
063/2064	734426326	0.372529	273595127	0.37510	275484203.5	0.375113	275492827.
064/2065	795769364	0.291038	231599366	0.29355	233599977.3	0.293564	233609118.
065/2066	791238693	0.227374	179906850	0.22973	181773351.3	0.229743	181781886.
066/2067	786481532	0.177636	139707185	0.17979	141399652.6	0.179797	141407399.
067/2068	781486513	0.138778	108453040	0.14070	109955869.4	0.140710	109962753.
068/2069	776241743	0.108420	84160298	0.11011	85473411.7	0.110120	85479432.1
069/2070	823917649	0.084703	69788539	0.08617	70999447.3	0.086180	71005003.9
070/2071	874509180	0.066174	57870163	0.06744	58975638.4	0.067444	58980715.6
071/2072	928194026	0.051699	47986506	0.05278	48987374.4	0.052782	48991975.1
072/2073	985413930	0.040390	39800552	0.04130	40700637.1	0.041307	40704778.1
073/2074	985413930	0.031554	31094181	0.03232	31852118.6	0.032327	31855608.6
074/2075	985413930	0.024652	24292329	0.02530	24927311.5	0.025299	24930237.8
075/2076	799697405	0.019259	15401612	0.01980	15831408.2	0.019799	15833390.6
076/2077	798926100	0.015046	12020904	0.01549	12377632.5	0.015495	12379279.4

077/2078	798209172	0.011755	9382904	0.01212	9677981.9	0.012126	9679345.3
078/2079	797543056	0.009184	7324276	0.00949	7567620.5	0.009490	7568745.9
079/2080	796921506	0.007175	5717631	0.00743	5917767.1	0.007427	5918693.4
080/2081	796343763	0.005605	4463661	0.00581	4627858.0	0.005812	4628618.6
081/2082	795805605	0.004379	3484879	0.00455	3619291.4	0.004549	3619914.6
082/2083	795304164	0.003421	2720846	0.00356	2830654.9	0.003560	2831164.5
083/2084	794836812	0.002673	2124412	0.00279	2213954.9	0.002786	2214370.7
084/2085	794401138	0.002088	1658787	0.00218	1731680.5	0.002180	1732019.3
085/2086	793994918	0.001631	1295265	0.00171	1354511.6	0.001706	1354787.3
086/2087	793616102	0.001274	1011443	0.00134	1059528.4	0.001335	1059752.3
087/2088	793263809	0.000996	789839	0.00104	828813.6	0.001045	828995.3
088/2089	792932976	0.000778	616804	0.00082	648355.0	0.000818	648502.1
089/2090	792625627	0.000608	481692	0.00064	507202.7	0.000640	507321.8
090/2091	792338880	0.000475	376185	0.00050	396790.8	0.000501	396887.1
091/2092	792071339	0.000371	293796	0.00039	310421.7	0.000392	310499.4
092/2093	791821706	0.000290	229455	0.00031	242857.9	0.000307	242920.6
093/2094	791588773	0.000226	179209	0.00024	190003.5	0.000240	190054.1
094/2095	791371414	0.000177	139969	0.00019	148655.0	0.000188	148695.7
095/2096	791168583	0.000138	109323	0.00015	116306.8	0.000147	116339.6
096/2097	790979303	0.000108	85388	0.00012	90999.4	0.000115	91025.7
097/2098	790802665	0.000084	66694	0.00009	71199.8	0.000090	71220.9

098/2099	790637821	0.000066	52094	0.00007	55709.0	0.000070	55726.0
099/2100	790485426	0.000051	40691	0.00006	43589.2	0.000055	43602.8
100/2101	790340124	0.000040	31784	0.00004	34106.4	0.000043	34117.3
101/2102	790206192	0.000031	24827	0.00003	26687.0	0.000034	26695.7
102/2103	790081188	0.000025	19393	0.00003	20881.8	0.000026	20888.8
103/2104	789964519	0.000019	15148	0.00002	16339.6	0.000021	16345.2
104/2105	789855627	0.000015	11833	0.00002	12785.5	0.000016	12790.0
105/2106	789753995	0.000012	9243	0.00001	10004.6	0.000013	10008.2
106/2107	789659138	0.000009	7221	0.00001	7828.6	0.000010	7831.5
107/2108	789570605	0.000007	5640	0.00001	6125.9	0.000008	6128.2
108/2109	789487974	0.000006	4406	0.00001	4793.6	0.000006	4795.5
109/2110	789410852	0.000004	3442	0.00000	3751.1	0.000005	3752.6
n.Y.CFAT	42478921.1	0.000004	170	0.00001	424.8	0.000005	201.9
		Total NPV	2483340177		2505243937.6		2505344110
		Net outlay	2505257521		2505257521.0		2505257521
		NPV	-21917344		-13583.4		86589.2

Source: - Annual Report of CHPCL, Estimation & calculation

Where,

LR =27.7778%

HR = 27.78

NPV_{LR} = Rs.86589.2

NPV_{HR} = Rs. -13583.4

$$IRR = LR + [\frac{NPV_{LR}}{NPV_{LR} - NPV_{HR}} \times (HR - LR)]$$

$$= 27.7778\% + [\frac{3641.97}{364197 + 8472.07} \times (27.78\% - 27.7778\%)]$$

= 27.777986%

APPENDIX-V

Calculation per Unit Cost

Years	Prodn. Unit	Sales Cost Rs.	Adm. Cost Rs.	Total cost	Cost/Unit	Incr or dec	%increase
2060/061	111412807	30037946	35015753.92	65053699.81	0.5838978620		
2061/062	124486883	33379496	42879666.93	76259163.07	0.6125879388	0.028690077	5%
2062/063	136328395	41025450	88826873.34	129852323.44	0.9524965319	0.368598670	63%**
2063/064	139650818	54088762	33878724.57	87967486.14	0.6299102819	0.046012420	5%

Source: CHPCL annual Report

Note:

According to company policy, preliminarily operating expenditure write within five year equally, in head of Deferred Revenue Expenditure. But in year 2062/063 company write all Deferred Revenue Expenditure. So it affects in F Y 2062/063 to increase 63% in cost.

APPENDIX-VI

Questionnaire

Nammaste! I am Prakash Paudel. I am studying MBS at Shanker Dev College. Currently, I am conducting a research on "Capital Budgeting of Chilime Hydropower Project" to prepare my thesis. In this connection, I am going to ask you some questions about your company's Capital budgeting tools practice. Information provided by you will be kept confidential and will be used solely for the purpose of thesis writing. This interview will take about 30 minutes. I hope, you will cooperate me for providing accurate information that I need.

Researcher	**Respondent**
Name:- Prakash Paudel	Education:
Roll No – 537/062	Organization:
Level M B S	Position:
Shanker Dev Campus	Date:

Questions: Please tick the (☐) following Questions:-

Q.N. 1 Is your project Capital budgeting tools practice or not?

☐ **YES** ☐ **NO**

Q.N. 2 Capital Budgeting tools should practice for investment decision?

☐ **YES** ☐ **NO**

Q.N.3 your project which tools are used among the following?

☐ **PAYBACK PERIOD** ☐ **NPB**

☐ **IRR** ☐ **ARR**

☐ **ALL** ☐ **NON OF ALL**

Thank you very much for your kind cooperation!

APPENDIX-VII

CAPITAL BUDGETING OF CHILIME HYDROPOWER PROJECT