CHAPTER - I

INTRODUCTION

1. 1 Background of the Study

Every business enterprises hold their own objectives. The primary objective of an enterprise is to generate profit with bearing social responsibilities. These two parts are interlinked with each other. Without economic contribution, social service can not be provided. Also the long-term objective, in simple term let say profit, cannot be achieved through standing against the society. Mean while the self survival, growth and continuity of the organization totally depends upon the degree of its profit.

Profit is the ultimate goal of every business organization. But the profit can not be achieved automatically. It should be managed well with better managerial skills. So, the profit is a planned and controlled output of management. Profit planning and control means the planning of revenue i.e. increase the revenue, and control the cost i.e. control the inefficiency of cost. Therefore, planning and control are mainly focused on profit planning and control out of five functions of management i.e. planning, organizing, staffing, leading and controlling. Management process is the process of planning, organizing, staffing, leading and controlling effectively, efficiently and economically to attain the pre-determined goals or objectives. It gives the basis for PPC.

Comprehensive profit planning and control (profit planning and control) is a new term in the literature of business, not a new concept in management, not an end and a substitute of management. The other terms, which can be used in same context, are comprehensive budgeting, managerial budgeting and simply budgeting. The profit planning and control can be defined as a process/technique/tool of management that enhances the efficiency of

management. Profit planning and control involves development and application of broad and long range objectives for the enterprise, specification of goals, strategic or long term goals, tactical or short range profit plan, a systematic performance reports detailed by organized responsibilities, control system, follow up procedures.

Hence, profit planning and control guidelines and acts as signal light to and for the management, which enables the management to correct its policy and to show its direction for achieving maximum result within a definite period. It consist three main budgets:

- Operation budget (budget related with revenue and expenses)
- Financial budget (budget related with financial statements)
- Appropriation budget (budget related with advertising and research expenses

As we earlier said that the prime objective of business enterprise is to generate profit, the first consideration of managerial budgeting or say budgeting must start from profit plan. To attain planned profit, a comprehensive budget should be made properly. It reduces the clouds of uncertainty and removes the risks over investment and future revenue. Therefore, budgeting is the foundation or a prime tool for profit planning in every type of business enterprises including Nepalese Public Enterprises too.

1.2 Public Enterprises

1.2.1 Meaning of Public Enterprises

Public enterprises are those which are managed, controlled and owned by Government to provide goods or services to the people at fair price. In such enterprises, half or more than half of total shares are owned by government. In Nepal, public enterprises are established with the fund of HMG or with the help of financial assistance of international agencies or foreign countries.

Public enterprises are established not only for commercial purpose but also for public welfare and thus are strong means of socio-economic development of the nation. Standing on that fundament, public enterprises have to maintain proper balance between profit and service.

Mainly the exploitation of consumers and workers, necessity of developing infrastructure, defence structure, utilization of natural resources and unemployment condition of the nation compels the government to establish public enterprises. “When we see the history of PEs, we find that most of them well created by the government themselves to manage certain key sectors of the economy” *(Joshi, 1989: 1).*

Different scholars, agencies and government have defined the term ‘public enterprise’ differently to suit their own respective situations. According to Hanson “Public Enterprises mean ownership and operation of industrial, agricultural, financial and commercial undertakings”. In the words of World Development Report, 1998, “State owned enterprises are financial autonomous and legally distinct entities wholly or partly owned by government”.

Public enterprises are the state owned enterprises and are financially autonomous and legally distinct entities. They are generally owned and controlled by the government. The ownership with the government should be 51 percent or more to make entity PE. Public enterprises are usually autonomously organized with the government providing the initial capital and being responsible for contributions overview of their activities finance and development. They are government creations with certain missions and objectives. However, control by the government at every aspect of public enterprises in undesirable. They should have certain degree of freedom as well *(Baral, 2001: 2).*

UN has defined Public Enterprises as "those organizations, namely governmental enterprises and public corporations which are entirely or mainly owned and/or controlled by the public authorities consisting of establishment which by virtue of their kind of activities, technology and mode of operation are classified as industries".

Public enterprises were established in developed countries in 18th century and in the developing countries after Second World War. In context of Nepal, Nepal Bank Ltd. was established in 1904 BS in private sector but after 2010 BS, Government purchased 51% of its shares and it became first public enterprise in Nepal. During the Second World War, some other PEs was established. However, they could not make any substantial progress. Nepal started its planned economic development from 2013 BS. Then the numbers of public enterprises have increased substantially in the various fields of national economy. There were 64 PEs in Nepal before privatization program of HMG lunched. They are manufacturing as well as service enterprises. Both of them are interested to earn profit by bearing social responsibility as well. Among them, Nepal Electricity Authority is the one.

1.2.2 Role of Public Enterprises in Nepal

Nepal a land locked country is one of the least developed countries of the world with poor economic condition. It has an area of 147181 square kilometres, length of 885 kilometres from east to west and average breadth about 193 kilometres from north to south. More than 32% of people are living below poverty line. Per capita income of Nepal is about $ 236, GDP growth rate is around 3.7% and it has also fluctuation trend. More than 80% of people still depend on agriculture and not more than 10% on industrial sector for their livelihood.

Nepal is exercising mixed economic policy for its economic prosperity. It creates the co-existence of private and public sector. Despite many private

enterprises, they are only oriented to generate profit and ignore social welfare, compel the Government to reserve some enterprises by full or partial ownership.

The co-existence of the both private and public sector is necessary and useful for achieving the twins' objectives of social and economic development, envisaged in national level policy. Mainly, the role of PEs has been in basic infrastructure, defence sector, industrial states, public utilities, commercial sector, trading and banking sectors. PEs are important to create industrial bases in the country, to provide better goods/services to the people at reasonable price, to generate employment opportunities, to collect government revenue, to mobilize the national resources into productive uses and to fulfil the government plans and objectives. PEs has helped to boost the standard of living, to balance regional development, to utilize resource optimally, to contribute import substitution and export promotion.

So, the role of PEs in developing countries like Nepal is the most important for socio-economic development of people, enterprise and the nation. No nation in the world is without public enterprises.

Though, almost Nepalese PEs have been suffering from regular operation loss according to the past annual budgets and economic surveys of the various projects. They are unable to generate substantial return from their investment and at last to contribution to the nation through dividend as well as tax. They are creating a huge amount of liabilities and being the financial burden to the government and thus after the restoration of Democracy, the government has adopted the policy of privatization. During the eight five year plan, the industrial act 2049 was enforced and equally, privatization took place.

1.3 A Brief Overview of Nepal Electricity Authority (NEA)

Nepal is one of the richest countries in natural resources of the world. It has various natural resources. Hydro-electricity potential is one of them. It is the richest country after Brazil in hydro-electricity potential in the world.

Nepal has more than 6000 rivers and rivulets with total annual average run off capacity of 200 billion cubic meters and storage potential in the form of ice snow of 88 billion cubic meters. This provides capacity to generate 83000 megawatts of hydropower, of which approximately 42000 megawatts have been determined as economical feasible. Despite the existence of such huge hydro power resources, potential development of hydro power has not taken place satisfactorily. Nepal had developed its first hydro power station 'Pharping' in 1911 AD and since then till 2006/07, Nepal has been able to develop total installed capacity of 1,760.73 GWh only, which is nominal of total potential capacity. Though, Nepal Electricity Authority is heading towards to electrify over the kingdom of Nepal.

Nepal Electricity Authority, a full government undertaken public utility enterprise, was formed on 1st, Bhadra 2042 BS (1985 AD) amalgamating the department of electricity, Nepal Electricity Corporation and number of other related departments according to NEA act 2041 BS. The central office of NEA is in Kathmandu. On the basis of organization expansion, number of its staffs, its assets and investment, and areas of its power supply works, NEA is the largest public utility enterprise in Nepal. It has established its branch offices, distribution sectors, power houses; grid houses in all over the kingdom are about 200. About 10000 staffs are presently employed here. The main purpose of NEA is to provide electricity service to customers at an affordable price. It is also responsible for making generation, transmission and distribution of Electricity throughout the kingdom of Nepal. During the year 2006/07, "the number of NEA's customers reached to 1.39 million, which is an increase of 8.97% over the previous year". And through which, "despite the various

obstacles posed by the transitional phase of the country, total revenue increased by 12.20% to reach a figure of NRs 15,677.00 million" .

1.4 Focus of the Study

Budgeting is the major tool of every business enterprises to achieve their goals by removing the clouds of uncertainty and risk.

Without proper planned sales revenue and controlled expenses through budgeting, desired profit cannot be secured and that makes PEs fiscal burden to the government. The various types of budget are used for the planning of profit, and comparing with the actual achievement by using different tools such as cost volume profit analysis, variance analysis etc. Standing on that context, this study will mainly focus on the different types of functional budgets and corporate planning practices and its effects on profitability of NEA.

This study will also focus to the responsibility body in preparing various budgets.

1.5 Statement of the Problem

The development of a country depends upon the proper exploitation of the available resources. In Nepal there are various public enterprises established in many sectors to utilize the resources for the overall development of the country with effective goal and objectives, but majority of the public Enterprises have not been able to operate their activities without loan grant and donation from the foreign government and donor agencies because of their poor financial performance. Many public enterprises prepare their long and short range plans on the adhoc basic. The main causes of the failure of such PEs are the lack of integration of activities, less utilization of capacity and lack of motivated skilled manpower.

While talking about the utilization of electricity, we find only about 22% of the total population have access to it, that's too mainly in urban and in some pockets of the rural area. The majority of population who has access cannot afford to use electricity even for cooking, heating etc. because of high per unit production cost. They depend on indigenous sources of energy as forest, agriculture residue, animal waste and imported petroleum products. The high rate of deforestation and huge amount of investment in petroleum products are continuously deteriorating the environment and economy of the country. The radical change in climate is damaging the country annually from disaster in forms of flood, landslides and draught etc. The government is making efforts to tackle the problem.

NEA, the major leading public Enterprise functioning in public utility sector has not been able to generate and supply electricity to rural areas. It has not completed many projects yet. Corruption and inefficient management system in it have interfered in achieving its objectives moreover; no enterprise can survive without profit and competitive market. The success or failure of any enterprises is measured on the basis of profitability or say surplus. The profit depends on the systematic budgeting and financial performance. Standing on that ground, this research intends to explore the following problems:

1. Which process of managerial budgeting applying by NEA?
2. What are the main problems facing by NEA in developing and implementing the managerial budgets?
3. What the fundamental principles are adopted by NEA in long term and short term profit planning?
4. Leakage of electricity

1.6 Objectives of the Study

The main objective of the study is to analyze the budgeting part of NEA and its impact on actual performance which can be measured through profitability. The specified objectives of the study are as follows:

1. To analyze the various functional budget of NEA
2. To analyze the true picture of managerial budgeting adopted by NEA.
3. To analyze the variance between budget and actual achievements of the authority.
4. To point out the major shortcomings and to recommend the company based on major findings of the study.

1.7 Significance of the Study

Managerial budgeting is the key of financial planning and control. Profit is the essence of any business organization. Business organization can and equally shall not run without profit. This study will be completely concentrated to assess the profitability of power center by analyzing various functional budgets prepared at different levels. Profit is lifeblood of any enterprise which doesn't happen all of sudden. Profits are managed when a management plans its activities. It is a part of overall planning process of an organization. The process of preparing budget to achieve management objective is called budgeting.

Till date we are facing the problem in using the scarce resource efficiently due to the poor profit plan. In order to rectify this, the concerned authorities and enterprises should be aware and make proper plan for future. It will help the organization to define how far the plan has conformity with the objective of profit maximization. The foregoing information can be a basis to identify the strengths and weakness of the organization in term of profitability.

Profit is the most indicators in judging managerial efficiency. No organization can exist without profit which happens through the efficient application of

various types of budgets. So, it is necessary to analyze the various types of functional budgets for comprehensive profit planning. This study is concentrated to analyze and examine the managerial budget as a tool of increasing efficiency of Nepal Electricity Authority.

Mainly, this study will be useful and beneficial to following group and individuals:

1. Major stakeholders who are interested to the budgeting practices of NEA.
2. NEA itself to improve or restructure the entire system or practice of budgeting.
3. Board of directors and management body of NEA and,
4. Researchers to do further research in the same field.

1.8 Limitations of the Study

The study will be confined within the detailed analysis of various functional budgets and its relation with profitability of NEA. The following factors have limited the scope of the study:

1. This study covers only last five years data.
2. This study will be concerned on budgetary system and its effect on comprehensive profit planning of NEA. Thus it will may or may not be applicable to other public enterprises.
3. Time constraints may limit the areas covered by the study.
4. The entire study will be based upon secondary data and a few primary data.

1.9 Organization of the Study

The entire study will be designed into five main chapters. They are:

Chapter 1:- Introduction

It is and initial phase of the thesis that includes general introduction, a brief review of NEA, focus of the study, statement of the problem, significance, objectives and limitations of the study.

Chapter 2:- Review of Literature

This chapter includes two main aspects; conceptual framework and review of related study. The conceptual framework includes fundamental concept and component of managerial budgeting. It mainly deals with theoretical analysis and briefly reviews the concept related to the study and also deals with literature review of previous research works done in managerial budgeting of NEA.

Chapter 3:- Research Methodology

This chapter reveals the methodology adopted in carrying out the research work. It includes introduction, research design, sources and nature of data, period covered, research variables, research tools used and research questions for the study.

Chapter 4:- Presentation and Analysis of data

It will be concerned with the presentation and analysis of data that has been collected through various sources. It will mainly consist of interpretation and analysis of data with the help of various analytical tools and techniques and major findings regarding the study will also be included.

Chapter 5:- Summary, Conclusion and Recommendations

This chapter includes summary and conclusions of the study and also recommends some suggestions and measures to solve the present shortcomings regarding comprehensive budgeting of NEA.

Besides these, bibliography, appendices and other related items or figures will also be included at the end of the study report.

CHAPTER - II

REVIEW OF LITERATURE

2.1 Theoretical Review

2.1.1Concept of Managerial Budgeting

Managerial budgeting is viewed as a systematic and formal approach or process designed to help management for preparing significant phases of the management and control functions. Specifically, it involves: -

1) The development and application of broad and long range objective for the enterprises.
2) The specification of enterprise goals.
3) The development of profit plan with assigning responsibilities.
4) A system of periodic performance reports detailed by assigned responsibilities and,
5) Follow up procedure.

Managerial budgeting is a component of overall planning procedure of an organization. The managerial process and profit planning are interrelated to each other. Success of management always depends on well plan.

Managerial budgeting is a tool, which may be used by the management in planning the future course of action and controlling the actual performance because it is a written plan in which all aspects of business operation concerned with future period are included. Managerial budgeting is a predetermined detail plan of action developed and distributed as guide to current operation and a partial basis for the subsequent evaluation of performance.

The primary aim of managerial budgeting is to assess in assuring the procurement of the profit planned and to provide a guide for assisting in establishing the financial control policies including fixed assets additions, inventories and the cash position. The adoption of a correctly constructed profit

plan provision provide opportunity for a regular and systematic analysis of incurred or anticipated expenses, organized future planning fixing of responsibilities and stimulation of effort. In short it provides a tool for more effective supervision of individual operations and practical administration of the business as a whole.

2.1.2 Concept of Profit

Profit is the primary objective of a business. In view of the heavy investment which is necessary for the success of most enterprises, profit lies the accounting sense, tends to become a long term objectives, which measure not only the success of a product but also of the development of the market for it. The word profit implies a comparison of the operation of business between two specific dates, which are usually separated by an interval of one year. In order to optimize those corporate source of wealth on which national prosperity depend, the basic financial objectives of companies is to maximize, with in socially acceptable limits, profit from the use of the fund employed by them. No company can survive long without profit for; profit is the ultimate measure of its effectiveness, and in a capitalist society, there is no future for a private enterprise which always incurs losses. Profit is a signal for the allocation of resources and a yardstick for judging managerial efficiency. In fact, it is the growth of profit which enables a firm to pay higher dividend to its ordinary share holder. Profit result from transaction. Profit is the dominant goal in business, and profit making should be the main objectives in term of which the general effectiveness of an organization is measured. Profit is also defined as a surplus of revenues and the after the deduction of all the expenses incurred on earning it. Usually, profits do not happen; they are managed *(Kulkarni, 1992: 310-311).*

Profit is the income received by the organizer. It is the reward for the services of an entrepreneur. A firm makes profit when it receive a surplus after it has paid interest on capital, wage to labor which id equal to the difference between

the total revenue ad total cost of production. Profit earned by the entrepreneur may be broadly divided into two categories viz. the gross profit and net profit. Gross profit of the entrepreneur refers to whole of the income earned by him. It consists of the reward for the factors of production supplied by the organizer himself, reward for management and reward for the organization of production

Hence, profit is the amount after deducting cost from revenue. It determines from cost and revenue. Every business enterprise makes an investment of a huge amount with taking a higher degree of risk and thus they expect higher rate of return and so we can say that profit is the reward against risk and innovation.

2.1.3 Concept of Planning

In translating goals and objectives into success, the specific activities, sufficient resources and their proper management are required, which is called planning. Every organization shall develop three types of plan, short, intermediate and long term. Managers at every level of management perform planning. It is a decision in advance for what to do, when to do, how to do and who will do the particular tasks. Thus, it is the process of developing objectives and selecting a future course of action to accomplish them. It includes:

- Establishing enterprises objective.
- Developing premises about the environment in which they are to be accomplished.
- Selecting a course of action for accomplishing the objectives.
- Initiating activities necessary to translate plans into actions.
- Current re planning to correct current deficiencies.

2.1.4 Planning Vs Forecasting

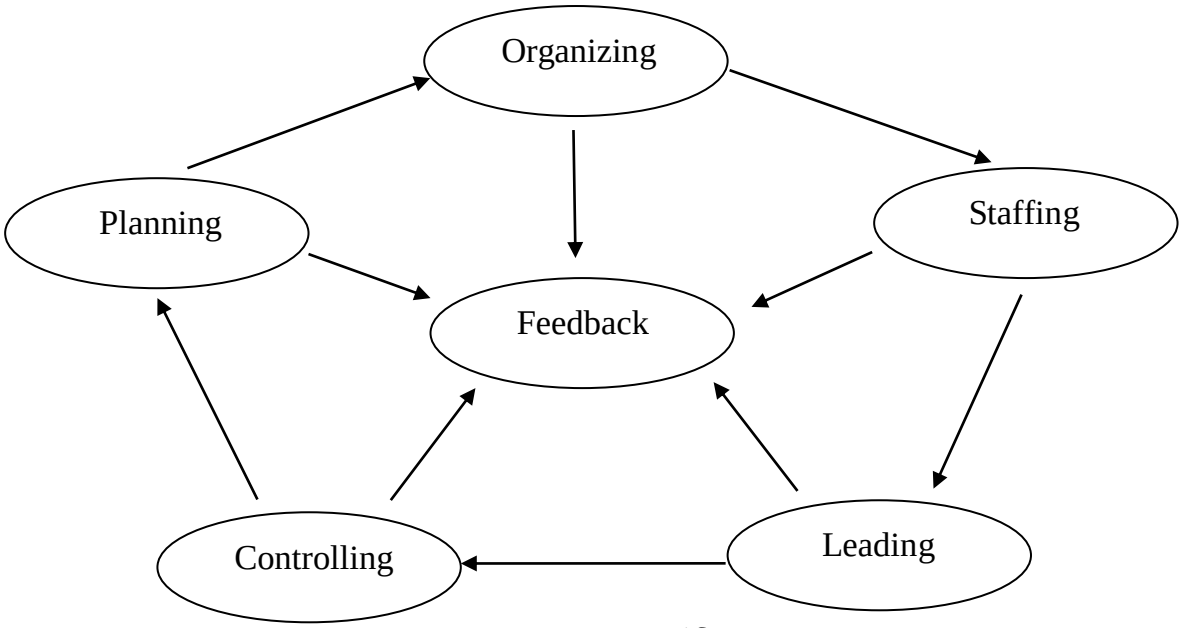
Forecasting and planning are not of the same meaning. Simply we can say that forecasting is expected future conditions. These expectations depend up on some assumptions, which are very useful. Forecasting is our best thinking

about what will happen to us in future. In fact, planning comes only after forecasting as second step. Planning entails regular measurement of progress toward objectives and goals and the execution of strategic and action program. Yet it is clearly recognized that plans often have to be altered in the light of new circumstances. It should be continuous process and not once or a year experience.

Planning and forecasting are often confusing and ambiguous. Although they are related, have distinctly different purposes. A forecasting is not a plan: rather it is a statement and a quantified assessment of future condition of the particular subject based on one or more explicit assumptions. Forecasting, one of the essential elements of planning is a predication of what will happen on the basis of certain assumption, but planning is an attempt to determine what should happen and then to take steps that will make it likely to happen.

2.1.5 Management process

Management is the process that includes planning, organizing, staffing, leading and controlling. The five function of management collectively constitute the management process, because they are concurrently and continuously being performed in managing enterprise the management process uses sequential linkage and feedback. The five functions and the management process are given below:- Figure No:-2.1



2.1.6 Fundamental concept of Managerial Budgeting

The fundamental concept of managerial budgeting includes the underlying activities or tasks that must generally be carried out to attain maximum usefulness from managerial budgeting. These fundamental have been full codified. As a basis for discussion, an outline of the fundamental concept usually identified with managerial budgeting is given below:-

2.1.6.1 Management involvement and commitment

Management involvement entails managerial support, confidence, and participation and performance orientation. In order to engage competently in comprehensive managerial budgeting, all levels of management, especially top management must (1) understand the nature and characteristic of PPC, (2) be convinced that this particular approach of managing is to devote the effort required to make it operation, (3) support the program in all its panning process as performance commitment. For a comprehensive budgeting program each member of management must be motivated and directed toward achieving goal through preplanned activities.

2.1.6.2 Organization adaptation

A managerial budgeting or PPC program must rest upon a sound organization structure for the enterprise and clear cut line of authority and responsibility. The purpose of organization structure and the assignment of authority are to establish a framework within which enterprise objectives may be attained in a coordinated and effective way on a continuing basis. The scope and interrelationship of the responsibilities of each individual manager are specified. To increase managerial and operational efficiency, practically all enterprise, except perhaps the very smallest ones, should be structurally disaggregated into organization subunits. Thus, the company as a whole is a responsibility center, as is each division, department, and sales district.

Responsibility center are future classed in respect to the extent of responsibility as follows:-

1. cost center
2. revenue center
3. profit center
4. investment center

2..6.3 Responsibility Accounting

Every planning will be made with the help of historical data supplied by accounting department and controlling will be made by evaluating both actual and budgeted data. Therefore, accounting system of any enterprise should be built around the responsibility accounting. So, managerial budgeting program find it necessary to analyze with a consequent reorganization of the system on a responsibility accounting.

2.6.4 Full Communication

Managerial budgeting can be done only with more effective communication network in an enterprise. Full communication means, each unit of the organization or enterprise can be familiar with goal and objective. Communication can be of dialogue, message or understanding from working together. Although, in practice the management gives least importance to communication, it is most important thing for the observation and control of an organization.

For managerial budgeting, effective communications means development of well defined objective, specification of goals, development of profit plan and reporting and follow up activities related to performance evaluation for each responsibility center.

2.6.5 Realistic Expectation

In managerial budgeting or PPC, expectation must be realistic and avoid being either mainly conservations or irrationally optimistic. The care with which budget goal are set for such items as sales, production levels, cost, capital expenditures, cash flow and productivity determines the usefulness of a managerial budgeting program. For managerial budgeting or PPC purposes, enterprise objective and specific budget goal should represent realistic expectations. To be realistic expectation must be related (1) to their specific time dimension and (2) to on assumed external environment that will prevail during that time span. Within these two constraints, realistic expectation should assume a high level of overall efficiency; however, the objective this and goal should be attainable.

2.6.6 Flexible Application

Managerial budgeting program or any other management techniques should not be dominated by the management. Such techniques of management must be flexible. These are the techniques, which is not only the end of the management itself because the main end or aim of the management is to use the resources in the most effective way and earn high return against investment and for this purpose managerial budgeting or other techniques are to be used as mean only.

2.6.7 Activity costing

Responsibility accounting system generally accumulates costs by department, and product costing systems associate costs with unites of product or services. Organizations also frequently find it useful to associate cost with activities. By decomposing as organization's production process into a discrete set of activities, and them association costs with each of those activities management is in a better position to determine the costs and benefit of continuing the activities.

2.1.6.8 Zero- base budgeting

Zero base budgeting is constructed on the premise that every activity in the budget must be justified. It starts with the basic premise that the budget for next year is zero and that every expenditure, old and new, must be justified on the basis of its cost and benefit. The discipline of zero base budgeting takes a different approach in fact, a reverse approach to this problem of justifying everything. What it says is this: begin with where you are and establish a business as usual budget for next year the same way and the same thing you would do if you weren't concerned about constraint and total justification.

2.1.7 Establishing the Foundation for Managerial budgeting

To establish sound foundation for initiating a managerial budgeting program, the following steps should be followed:-

Step 1: There must be commitment by the top management to the broad concept of managerial budgeting or PPC and a sophisticated understanding of its implication and operations.

Step 2: The characteristics of the enterprise and the environment in which it operates including the controllable and uncontrollable variables must be identified and evaluated so that relevant decisions may be made over the characteristics of a managerial budgeting or PPC program that would be effective and practical.

Step 3: There should be an evaluation of the organization structure and assignment of managerial responsibility and implementation of changes deemed necessary for effective planning and control.

Step 4: There must be evaluation and reorganization of the accounting system to ensure that it is tailored to the organization responsibilities so that it can provide data particularly useful for planning and control purpose.

Step 5: A policy determinations must be made about the time dimensions to be used for managerial budgeting or PPC purposes.

Step 6: A program of budget education should be developed to inform management at all levels about (a) the purpose of the program; (b) the manager in which it will operate, including the basic management policies and guidelines for the administration; (c) the responsibility of each level of management in the program; and (d) the ways in which the program can facilitate the performance of each manager's function (*Welsch, Hilton and Gordon, 2001:59*).

2.1.8 Objectives of Managerial Budgeting

The main objectives of managerial budgeting are as follows:-

1. To state the firm's goal in clear formal term to avoid confusion & facilities their attainability.
2. To communicate expectation to all concerned with the management to the firm so that they are understood support and implemented.
3. To provide a detailed plan of actions for reducing uncertainly and for its proper direction of individual and group efforts to achieve goal.
4. To co-ordinate the activities and effort in such a way that the use of resources maximized.
5. To provide a means of measuring and controlling the performance of individual and nit and to supply information based on which the corrective action can be taken.

2.1.9 Advantages of Managerial Budgeting

The main advantages of managerial budgeting are as follows:-

1. It forces early consideration over basic policies.

2. It requires adequate and sound organization structure: that is, there must be a defined assignment of responsibility for each function of the enterprises.
3. It compels all members of management, from top to bottom, to participate in the establishment of goal and plans.
4. It requires adequate and appropriate historical accounting data.
5. It instills at all level of management the habit of timely, careful, and adequate consideration of the relevant factors before reaching important decision.
6. It reduces cost by increasing the span of control because fewer supervisors are needed.
7. It tends to remove the uncertainty that exists in man organizations, especially among lower levels of management, relative to basic policies and enterprises objectives.
8. It pinpoints efficiency and inefficiency.
9. It forces management to give adequate attention to the effect of general business conditions.
10. It forces recognition and corrective action.
11. It reward high performance and seek to correct unfavorable performance.

2.1.10 Disadvantages and Limitations of Managerial Budgeting

The main disadvantages of managerial budgeting are as follows:-

1. It is difficult, if not impossible, to estimate revenues and expenses in our company realistically.
2. It is not realistic to write out and distribute our goals, policies, and guidelines to all the supervision.
3. It creates all kinds of behavioral problem.
4. It adds a level of complexity that is not needed.
5. It is too costly, aside from management time.
6. The manager, supervision, and other employees hate budget

2.1.11 Components of managerial budgeting

The components of managerial budgeting can be mentioned as follows:

1. The Substantive Plan
2. The financial plan
3. Variable Expenses Budget
4. Supplementary Data
5. Performance Reports and
6. Follow –up

2.1.12 Process of Managerial Budgeting

The managerial budgeting process should involve periodic consistent and depth re planning so that all aspect of operation are carefully reexamined and re-evaluated. This prevents a budget planning approach that involves only justification of increases over the prior period. The concept of revaluation and the necessity to justify all aspect of the plan periodically finds its strongest support in what has been called zero base budgeting.

2.1.12.1 Identification and Evaluation of External Variable

Management planning must focus on how to manipulate the controllable variables. Moreover, there must be managerial planning of how to work with the non controllable variables. That is for both kinds of variable, how can management take advantage of potential favorable impacts and minimize potential unfavorable impacts and minimize potential unfavorable impacts on the enterprise? By relevant variable we mean those that will have a direct and significant impact on the enterprise.

Particularly, significant phase of this analysis includes an evaluation of the present strength and weakness of the enterprise. Planning must necessarily status with on objective and returns understanding of the present status of products, service, market, profit and returns on investment cash flow,

availability of capital, productive capabilities, and the competence of both management and non management personnel.

2.1.12.2 Development of Broad Objective of the Enterprise

Development of the broad objective of the enterprise is a responsibility of executive management. Based on a realistic evaluation of the relevant variable and an assessment of the strengths and weakness of the organization, executive management can specify or restate this phase of the managerial budgeting.

2.1.12.3 Development of specific goal for the enterprise

The primary purpose of the "goal phase" of the PPC or managerial budgeting process is to bring the statement of broad objective into sharper focus and to generate more specific planning information from the realm of general information. It provides both narrative and quantitative goals that are definite and measurable and should be developed by executive management as the second component of the substantive plan for the upcoming budget year. These are specific goals that relate to the enterprise as a whole and to the major responsibility centers.

2.1.12.4 Development and evaluation of Company strategies

Company strategies are the basic ways and tactics that will be used to achieve planned objective and goal. A particular strategy may be of short term or long term. The purpose of developing and disseminating enterprise strategies is to find the best alternative for attaining the planned broad objectives and specific goals. Executive management must be creative and directly involve in the development of new strategies that focus on "how" and thus which outline a plan of action for the enterprise.

2.1.12.5 Executive management planning instructions

The executive planning instruction, issued by top management, communicates the planning foundation that is necessary for the participation of all levels of

management in the development of the strategic and tactical profit plan for the upcoming budget year. Executive leadership is fundamental in developing and articulating this planning foundation including the formulation of relevant strategies (*Welsch, Hilton and Gordon, 2001:78- 79).*

2.1.12.6 Preparation and evaluation of project plan

Project plan encompass variable time horizon because each project has a unique time dimension. Project plans encompass such item as plans for improvement of present product, new and expanded physical facilities, and entrance into new industries, exit from products and industries, new technology and other major activities that can be separately identified for planning purposes. The nature of project is such that they must be planned as separate units. During the formal planning cycles management must evaluate and decide upon the plan status of each project in process and select any new projective to be initiated during time dimensions converted by the upcoming strategic and tactical profit plan *(Welch, Hilton and Gordon, 2001: 79).*

2.1.12.7 Development and approval of strategic and tactical profit plan

The strategic long range and tactical short range profit plans normally should be developed concurrently for all practical purpose and that the executives in charge of each of the responsibility centers throughout the firm should participate in their development in harmony with planning premises. Meaningful participation in the planning process generates positive behavioral effects. A manager of each responsibility center has to initiate immediate activities within his own functional sphere to develop a strategic long range profit plan as soon as he receive the planning premises and procedural instructions.

2.1.12.8 Implementation of managerial budgeting

Implementation of management plan, developed and approved in the planning process involves the management function of leading as well as motivating

subordinates in attaining enterprise objectives and goals. For that, effective management at all levels requires in the enterprise to communicate the objectives, goals, strategies, and policies and make the subordinates to be understood. On the other hand, there are many facets involved in management leadership and each of them stands on their own values and norms. Thus under managerial budgeting process, management should be aware in establishing realistic and attainable goals and objectives; to the overall enterprise and to each responsibility center.

2.1.12.9 Use of periodic performance report

As profit plan are being implemented during the period of time specified in the tactical plan, periodic performance reports are needed. These performance reports are prepared by the accounting department on a monthly basis. Also some special performance reports are prepared more often on an "as needed" basis. These performance reports (a) compare actual performance with planned performance and (b) show each different as a favorable or unfavorable performance variation *(Welsch, Hilton and Gordon, 2001: 85)*

2.1.12.10 Use of Flexible expenses budgets

The flexible expenses budget is also known as the variable budget, sliding scale budget; expenses control budget or formula budget etc. The flexible budget concept completely applies only to expenses. It is completely separate from the profit plan, but used to complement it. In the context of Nepal, most of the companies' especially public enterprises do not have the practice of using flexible budget procedures. And rests integrate flexible expense budget to the profit planning procedures.

2.1.12.11 Implementation of follow-up

Follow up is an important part of effective control. Because performance reports are based on assigned responsibilities, they are the basis for effective follow up actions. It is important to distinguish between cause is primary a

responsibility of line management. Analysis to determine the underlying causes of both favorable and unfavorable performance variances should be given immediate priority. In the case of unfavorable performance variances after identifying the basis causes, as opposed to the results, are selected. Then the corrective action must be implemented *(Welsch, Hilton and Gordon, 2001: 88).*

2.1.13 Budgeting as a tool of managerial budgeting

A budgeting is a written plan for the future. The manager of firms which use budgets, are forced to plan ahead. Thus, these firms tend to do well because they anticipate problems before they occur. A firm without financial goal may find it difficult to make proper decision. A firm with specific goals, in form of a budget, makes many decision ahead of time. Budget helps a firm to control its costs by setting guidelines for spending money for undead items.

Budget as a tool of planning and control is clearly related to the broader system of planning and control in an organization. Planning involves the specification of the basic objectives that the organization will pursue and fundamental polices that will guide it. In operation term, it involves the step of setting objectives, specifying goals, formulating strategies, and expressed in financial terms, for the operation and resources of an enterprise for same specified period in the future *(Khan, Jhin, 1989: 296).*

Hence, budgeting includes sales, production, distribution and financial aspects of an organization. Budget programs are designed to carry out a variety of function, planning, evaluation of performance, coordinating activities, implementation of plans, communicating motivating and authoring.

2.1.13.1 Characteristics of Good Budgeting

The characteristics of good budgeting are as follows:-

1. Budgeting may be formulated for the organization as a whole as for any subunit.

2. A good system of accounting is also essential to make the budgeting useful.
3. A budgeting is a quantitative expression of a plan of action and aid to co ordination and implementation.
4. A good budgeting system should involve persons at different levels while preparing the budgets; the subordination should not feel only imposition on term.
5. Budgets are designed to carry out a variety of function planning, evaluating activities and implementation *(Rathman, 1974: 21- 22).*

2.1.13.2 Objectives of Good Budgeting

The main objectives of budgeting are 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 serves as a declaration of policies.
3. It is a control document by which management can monitor actual performance.
4. It is t he plan to forecast for future to avoid losses and to maximize profits, i.e. to help in planning.
5. It is a plan state the firm's expectation in clear, formal term to avoid confusion and to facilitate their attainability.
6. It defines the objectives for the entire executive's communication.
7. It is a plan to bring about co ordination between different function 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 co ordination and communication. It is a measure against which to evaluate the quality of management.
11. Budget facilitates centralize control with delegated authority and responsibility *(Rathman, 1974: 20).*

2.1.13.3 Classification of Budgets

The classifications of budgets are as follows:-

A) On the basis of time

1. Long term budget
2. Short term budget
3. Current budget

B) On the basis of function

1. Sales budget
2. Production budget
3. Direct material budget
4. Direct material purchase budget
5. Direct labor cost budget
6. Cost of production budget
7. Selling and distribution expenses budget
8. Cash budget
9. Capital budget

C) On the basis of flexibility

1. Static budget
2. Flexible budget

D) On the basis of nature of business activities

1. Capital expenditure budget
2. Operating expenditure budget

2.1.13.4 Problems and limitations of Budgeting

The major problems of budgeting system are as follows:-

1. Developing meaningful forecasting and plans, especially the sales plan.
2. Seeking the support and involvement of all levels of management.

3. Establishing realistic objectives, policies, procedures and standards of desired performance.
4. Educating all individual to be involved in the budgeting process and joining their full participation etc.

The following are the limitation of budgeting system:-

1. Budgeting is not an exact science. It success hinges upon the prevision 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 budgeting program is to understand by all and concerned effort for accomplishing the budget goals.
4. The presence of a budgeting system should not make management complacent. The get best results of management; management should use budgeting with intelligence and foresight. Budgeting cannot replace management.
5. Budgeting will hide in efficiencies if a proper evaluation system lacks. It should be re examined regularly.

2.1.14 Development of Managerial Budgeting

2.1.14.1 Sales Budget or Plan

Sales budget provides as estimate of goal to be sold and revenue to be derived from sales. It is a starting point in the budgeting procedure. Sales plan or budget is one of the function budgets and is essentially, a forecast of sales to be effected in a budget period. It defines the quantities and values of expected sales in total as well as product wise and area wise during definite future period. The preparation of sales budget is based up on the sales forecast the sales for the planning period.

Sales planning or budgeting provides basic management decision about marketing. Marketing decisions are basic approach for developing comprehensive sales plan and profit plan. Therefore, sales budgeting is the foundation of all other budgets as well as a tool of profit plan for the every business enterprises either they are manufacturing or non manufacturing and either public or private enterprises. If sales plan is not realistic, most other parts of overall profit plan cannot be realistic. Thus management should develop a realistic sales plan. If management cannot develop realistic sales plan, it will be little justified. Standing on the above definition the primary purposes of a sales plan can be stated as below:-

a) To reduce uncertainty about future revenue,
b) To incorporate management judgments and decisions into the planning process,
c) To provide necessary information for developing other element of a comprehensive profit plan, and
d) To facilitate management control of sales activities

A comprehensive sales plan comprises all sales activities. It is also referred as a market penetration plan. A common misconception is that sales planning involves for developing a profit. This shows only the amount of expected sales volume. But actually there are many variables, which influence to sales. So, we should be considering these influencing variable, when, preparing a sales plan.

Hence, sales plan is the strategizing point is the preparation of the managerial budgeting. All the other plan and budgets are dependent up on the sales budget. The budget is usually presented both in unites and in dollars of sales revenue or sales volume. The preparation of sales plan is based up on the sales forecast the sales for the planning period.

2.1.14.1.1 Strategic and Tactical Sales Planning

A sales plan can be developed of two types in accordance with period. Those are long term planning and short term planning. The planning prepared for more than one year is long term planning. Commonly, five years strategic sales planning is categorized as long range planning. The planning prepared for one year or less than one year is short range planning. It is also known as strategic and tactical sale plan.

Strategic long term sales plan is one of the first steps in the overall planning process. Long- term sales plans are usually developed as annual amounts. The long term sales plan uses broad grouping of product (product lines) with separate consideration of major and new products and services. Long term sales plan usually involve in depth analyses of future market potentials, which may be built up from a basic found of the economy, industry projections, and finally company objectives. Long term managerial strategies would affect such areas as long term pricing policy, development of new product and innovations of present products new directions in marketing efforts, expansion or changes in distribution channels, and cost patterns. The influence of managerial strategy decision is explicitly brought to bear on the long term sales plan primarily on a judgment basis *(Welsch, Hilton and Gordon, 2001:174).*

2.1.14.1.2 Purpose of a Sales Plans\ Budget

The main purpose of a sales plan is to express sales revenue for a specific future period. It is based upon:

- The present knowledge of the company,
- The environment and
- The management strategies.

The main purposes of a sales planning are as follows:-

1. To reduce uncertainty about future revenue,
2. To provide necessary information for developing other elements of managerial budgeting.

3. To facilitate management judgment and decision into the planning process.

2.1.14.1.3 Components of Comprehensive Sales Plan

A comprehensive sales plan should satisfy the requirement of, and be consistent with, the overall managerial budgeting program. The components of comprehensive sales plan can be shown with the following two broad phases as follows:-

(A) Components of the foundation for comprehensive sales planning:-

1. External variable identified and evaluated.
2. Broad enterprises objective and goal formulated.
3. Strategic for the company developed.
4. Planning premises specified.

(B) Components of a comprehensive sales plan:-

1. Management policies and assumptions.
2. Marketing plan (Sales and services revenues) revenues.
3. Advertising and promotion plan.
4. Distribution (selling) expenses plan *(Welsch, Hilton and Gordon, 2001: 175-176).*

2.1.14.1.4 Developing a Comprehensive Sales Plan or Budget

Basic steps in developing a comprehensive sales budget are as follows:

Step-1 To develop management guidelines in relation to sales plan including the sales planning process and planning responsibility.

Step-2 To prepare sales forecast consistent with specified forecasting guidelines including assumption. Forecasting method is broadly classified as:

1. quantitative
2. technical
3. judgmental

Step-3 To assemble all other relevant data as:

1. manufacturing capacity
2. sources of raw material and a labor force
3. capital availability
4. availability of alternative distribution channel

Step-4 Based on above steps, management evaluate and judgment to develop comprehensive sales plan. There are four different participation approaches widely used in the process of developing sales plan:-

1. Sales forces composite
2. Sales division managers composite
3. Executive decision
4. Statistical approach

Step-5 To get the managerial commitment in attaining the goals specified in the comprehensive sales plan.

Above steps must be revised and implemented in various ways depending on the characteristics of the business and the expertise of the management.

2.1.14.1.5 Method of projecting sales

Presenting future expectation over sales is such a complex work. Moreover it is based on the external or says uncontrollable factors like market structure, consumer behavior, other natural factors etc. and a little more on internal factors. Standing on the fact, a company's sales projection should be nearest to the reality and for tackling to that challenge, we can use one or more than one of the following methods:

1. Judgmental methods
2. Statistical methods
3. Special purpose methods

2.1.14.1.6 Consideration of Alternative in Developing a realistic Sales Plan or Budget

Sales plan is also a step of decision making process. All other are depended on it. In this plan the executive management has to choose one final alternative among the various alternatives. Important decision must be made on the issues of new product, pricing, expansion or contraction of sales areas, size of sales force, new distribution cost limitation, and advertising and other promotional policies. Basically, the following two types of problems should be considered while developing a sales plan:

(a) Price – Cost – Volume Consideration

(b) Product line alternative

2.1.14.2 Production Plan or Budget

2.1.14.2.1 Meaning

The production budget deals with the scheduling of operations, the determination of volume, and the establishment of maximum and minimum quantities or raw material and finished goods inventories. It summaries, details and after all provides the basis for preparing the budget of material, labor and factory overhead. These three elements selection of the income statement and their totals are estimated in the manufacturing budget.

Once sales and inventory requirement have been established, the logical first step in the production plan is a facility survey; this survey should determine that all planned products can be produced on existing or contemplated equipment and that they can be made the volumes required. In this initial stage availability of labor supply and skill are considered, bottlenecks caused by lack of kill or equipments are frequently uncovered. At this point decisions must be made either to eliminate bottlenecks or reduce planned volume *(Willam E. Thomsa: 58).*

The production plan involves of determining the number of unit of each product that must be manufactured to meet planned sales and maintaining planned inventory levels of finished goods. The production budget is prepared in units only, which can be shown in the following way:

Budgeted Production Units = Budgeted Sales Unit + Desired Closing Inventory – Opening Inventory

Thus, production is based on budgeted sales volume and desired inventory level. The responsibility for the preparation and operation of production budget is of the production manager.

2.1.14.2.2 Responsibility for Production Plan

Production manager are responsible for the development of production plan. The complete and detailed marketing plan is given to the production manager translating it into a production program, consistent with managerial policies and subject to certain constraints. Managers have firsthand knowledge of the plant and personnel capacities, availability of materials, and production process. Although the responsibility rests directly upon the production manager, the entire corporate policies must be considered in such matters as:

1. Inventory levels,
2. Stability of production and
3. Capital additions.

With respect to production planning, the manager must maintain an optimum co-ordination between sales, inventory and production levels. On the other hand, an efficient, standardized and co-coordinated plan is required for economic production.

2.1.14.2.3 General Considerations in Planning Production and Inventory levels

Following basic facts should be considerations while planning the production:-

1. Total production requirement (by product) for the budget period.

2. Inventory policies about levels of finished goods, work in process and the cost of carrying inventory.
3. Plant capacity policies, such s the limits of permissible departures from a stable production level throughout the year.
4. Adequacy of manufacturing facilities [expansion or contraction of plant capacity.]
5. Availability of direct material, purchased components and labor.
6. Length of the processing time.
7. Economic lots or runs.
8. Timing of production throughout the budget period, by product and responsible centers *(Welsch, Hilton, Gordon, 2001:214).*

However, the approach used by a particular company shall depend upon its size and the characteristics of its manufacturing processes.

2.1.14.2.4 Developing a Production Plan

The sales unit estimated in the sales budget must be translated in production units with considering management inventory policy. Production manager must translate the quantities in the sales budget in to required production unit for the budget perused for each product. Basically there are three major steps to be followed in developing a production plan:-

1. Establishing policies for inventory levels.
2. Planning the total quantity of each product that is to be manufactured during the budget period.
3. Scheduling the production by interim period.

2.1.14.3 Material Plan or Budget

Planning and controlling of material purchase and material usages is a comprehensive managerial budgeting of raw material involved in production process. Raw material budget is prepared after the determination of production. It is depended upon production volume. The material budget is the

responsibility of the purchasing manager, since it will be he or she who is responsible for obtaining the planned quantities of raw material to meet the production requirement. The objective is to purchase the material at the right time, from the right place and at the right price. In addition, it is necessary to take into account for maintaining the stock level of raw material.

A compressive managerial budgeting includes planning and controlling of raw material and components used in the manufacturing of finished product. Adequate co- ordination and balance should be maintained in between (a) factory requirements for raw materials, (b) raw material inventory levels, and (c) purchase of raw materials. Hence, planning raw material usually requires the following sub budgets:-

1. Materials Budget
2. Purchase Budget
3. Material and Inventory Budget

2.1.14.3.1 Material and Parts Inventory Policies

The primary consideration in setting inventory policies for materials and parts are:-

1. Timing and quantities of manufacturing needs.
2. Economic in purchasing through quantity discount.
3. Availability of material and parts.
4. Lead time.
5. Perish ability of material and parts.
6. Storage facilities needed.
7. Capital requirement to financial inventory.
8. Expected changes in the cost of material and parts.
9. Cost of storage.
10. Risks involved in inventories.
11. Opportunity costs.

2.1.14.3.2 Purchasing Policy

Management policy with respect to purchase and inventory should be specified. The two basic timing factors are (1) how much to purchase at a time and (2) when to purchase it. A well known approach to compute the purchase quantity is the Economic Order quantity Model (EOQ). Formula for the computation of EOQ is as follows:

$$\text{EOQ} = \sqrt{\frac{2\text{AO}}{\text{C}}}$$

Where,

A= Total quantity to be purchase

O= Average cost of placing an order

C= Annual carrying one unit in inventory.

The second question is; when to purchase? It can be determined by reorder point method. It is the point where the inventory level is equal to the quantity needed to sustain production for a period to reorder and receive the replenishments. It can be shown as follows:

Re Order Point= Average Usage x Average lead time + Safety inventory

2.1.14.3.3 Just in time purchase

Just in time purchase concept is the latest development in the field of material purchase and inventory control. Its primary objective is to minimize inventory levels and its cost. According to this approach, materials are purchased only at the time of production so as to minimize the inventory holding costs. But the problem is to anticipate the exact time of material requirement.

2.1.14.4 Planning and Controlling Direct Labor Cost

The direct labor budget is also developed from the production budget. Direct labor requirements must be computed so that the company will know whether sufficient labor times are available to met production needed. By knowing in advance, the company can develop a plan to adjust the labor force as the

situation may require. Direct labor requirements can be computed by multiplying product to be produced in each period by the number of direct labor hours required to produce a single unit. Many different types of labor may be involved. If so, then the computation should be made of the types of labor needed. The hours of direct labor resulting from these computations can then be multiplied y direct labor cost per hour to obtain the budgeted total direct labor cost.

Planning and controlling labor costs involve major and complex area: (1) personnel needs, (2) recruitment, (3) training, (4) job description and evaluation, (5) performance measurement, (6) union negotiation, and (7) wage and salary administration. A comprehensive managerial budgeting program should incorporate appropriate techniques and approaches applicable to each problem area. Careful planning and realistic control of long term and short term labor costs will benefit both the company and its employee. There are two types of labor costs as follows:

(a) Direct labor cost, and

(b) Indirect labor cost.

2.1.14.5 Planning and Controlling Expenses

The expenses planning and controlling is very necessary for supporting the objectives and planned programmers of the firm, an expenses in related with profit. It should not be forget that the minimization of cost is maximization profit. Manage should view expenses planning and control as necessary to maintain reasonable expense levels to support the objectives and planned programs of the enterprise. Expenses planning should not focus on decreasing expenses, but rather on better utilization of limited resources. Expenses planning and control should forces on the relationship between expenditures and the benefit derived from those expenditures and the benefits derived from that expenditure. The desired benefits should be viewed as goals, and sufficient resources must be planned to support the operating activities essential for their accomplishment.

2.1.14.6 Manufacturing Overhead Budget

Manufacturing overheads are the part of the total production cost, which do not directly identify with specific products or jobs. Manufacturing overhead includes many dissimilar expenses; therefore, they cause problem in the allocation of the costs to products. There are two distinct types of responsibility centers in most of the manufacturing companies, viz. production and service. Responsibility for the operation of each department should be classified separately in the chart of accounts used by the cost accounting department. Finally, the expenses of each depart should be planned and controlled separately.

After the production budget has been completed, manufacturing expense budget should be developed for each responsibility center in the organization. It provides a schedule of all costs of production other than of direct material and labor. These costs should be broken down by cost behavior as variable and fixed for budgeting purpose and a predetermined overhead rate should be developed. This rate will be used to apply manufacturing overheads to the units of production throughout the budget period. After all, the development of manufacturing overhead budget should be followed by the following consideration:-

1. Translate the requirement specified in the production plan with output or activity in each department.
2. Plan departmental overhead expenses.
3. Allocation of the planned departmental expenses to the producing department.
4. Allocation of the production department's expenses to the products.

2.1.14.7 Selling and Distribution Expenses Budget

The selling and administrative expenses budget contains a listing of anticipated expenses for the budget period that will be incurred in areas other then manufacturing. The budget will be made up of many smaller, individual budget

submitted by various person having responsibility for cost control in selling and administrative matters. If the numbers of expenses items vary large, separate budgets may be needed for the selling and administrative functions. Selling and distribution expenses include all cost related to selling, distribution, and delivery of products to customers. In many companies, this cost is a significant percentage of the total expenses. Careful planning of such expenses affects the profit potential of the firm.

2.1.14.8 Administrative Expenses Budget

Administrative expenses budget includes those expenses other than manufacturing and distribution. They are incurred in the responsibility center that provide supervision of and service to all function of the enterprise, rather than in the performance of any one function. Because large portion of administrative expenses are fixed rather than variable, the notion persists that they cannot be controlled. Aside from certain top manager's salaries, most administrative expenses are determined by management decisions.

It is advisable to base budgeted administrative expenses on specific plans and programs. Past experience, adjusted for anticipated changes in management policy and general economic conditions, is helpful. Because most administrative expenses are fixed, ad analysis of the historical record will often provide a sound basis for budgeting them.

2.1.14.9 Capital Expenditure Budget

Capital expenditure often called capital budgeting. Capital refers to total assets of the firm while budgeting is the monitory presentation of a plan. But in capital budgeting the term capital refers to the fired asserts used in the production while budgeting is a detailed outline of planned capital expenditure. Generally, the capital budgeting is concerned with expansion, addition and replacement of fixed assets.

The capital budgeting decision, as already pointed out; pertain to fixed assets or long term assets which by definition refer to assets which by definition refer to assets which are in operation, and yield a return, over a period of time, usually exceeding one year. The capital budgeting decision, therefore, involves a current outlay or series of outlays of cash resources benefits *(Quirin, 1967: 2).*

Hence, investment is long term assets for increasing the revenue of the firm is called capital budgeting. It is a decision to invest funds in long term activities for future benefits that increase the wealth of the firm and there increase the value of share of the firm. Capital budgeting plan to deploy the available resources of the purpose of maximizing the long term profitability of the firm. It involves the generation of investment proposals, the estimation of cash flows and the selection of projects based upon as acceptance.

2.1.14.9.1 Process for planning and controlling of capital expenditures

Capital expenditure is such a complex part in an organization. It plays a vital role in the determination of future of the organization and that is why a proper and an efficient process to make plan and get control over it should be followed as of below:

1. Identify and generation capital additional projects and other needs.
2. Develop and refine capital addition proposal- collection of relevant data about each proposal, including any related alternatives.
3. Analyze and evaluate all capital additions, proposal, and alternatives. Emphasis should be given to the validity of the underlying financial and operation data.
4. Make capital expenditure decisions to accept the vest alternatives and the assignment of project designations to selected alternatives.
5. Develop the capital expenditure budget;
    i. Strategic plan- Replant and extend the long term plan by dropping the past year and adding one year into the future.

ii. Tactical plan- Develop a detail annual plan capital expenditure budget, by responsibility center and time that is consistent with a comprehensive profit plan.

6. Establish control of capital expenditure during the budget year by using periodic and special performance report by responsibility centers.
7. Conduct post completion audits and follow up evaluation of the actual result from capital expenditure in period after completion.

2.1.14.9.2 Capital Expenses Decision

The crucial expenses decision is the choice of management from the computation of capital expenditure alternative problems.

1. Investment decision:

Selecting the best alternative based on their economic worth to the company called investment decision.

2. Financing decision:

Determining the amount and sources of funds needed to pay for the selected alternatives. This cash constraint may necessarily limit the project and proposal that can be initiated *(Welsch, Hilton, Gordon, 2001: 401).*

2.1.14.9.3 Evaluation of Investment Decision

There are several methods available for making such decision. Though some following are popular for the evaluation of investment proposals:

1. Net present value method:

NPV method is a discounted technique which recognizes the time value of money. It is a classic economic method for evaluating the investment proposal. It considers that the cash flows at different time period differ in their values.

$$\mathrm{NPV} = \sum_{t=0}^{n} \frac{At - C}{(1+k)^n}$$

Where,

k= cost of capital

T= no. of year

A= Expected cash inflow

c= initial cash outlays

Decision rule

1. Independent project: - All projects having positive net present (NPV) should be accepted and vice versa.
2. Mutually exclusive project: - Project having highest net present value should be accepted.

2. Internal Rate of Return (IRR):

IRR is the rate of return than an investment project earns. it is sometime referred to as time adjusted rate of return, yield of an investment, managerial efficiency of capital, rate of return over cost, time preference rate and break even rate. It is that rate which gives the project's NPV zero.

$$A_o = \frac{A_1}{(1+r)^1} + \frac{A_2}{(1+r)^2} + \cdots\cdots\cdots\cdots\cdots\cdots \frac{A_n}{(1+r)^n}$$

Where,

R= Internal rate of return

A_o= Initial investment at time zero

A_1, A_2, A_n= Cash inflow at future.

Acceptance rule

1. Independent project: - All projects that have IRR greater than required rate of return should be accepted.
2. Mutually exclusive project: - Project having higher IRR should be accepted.

3. Payback Period:

It is a popular traditional method of evaluating investment proposal. It is also called pay off period. It calculated the time require for getting back the investment amount. So, it is the length of time needed to get back the original investment from the investment project.

a) Payback period for having even cash flow:

$$\text{Payback Period} = \frac{\text{Net investment (NCO)}}{\text{Annual net cash flow}}$$

b) Payback period for project having uneven cash flow:

$$\text{Payback Period} = \text{Number of years before full recovery of NCO} + \frac{\text{Amount not recovered at start of year}}{\text{Cash flow of the recovered year}}$$

Decision rule

1. Independent project: A project should be accepted if its payback period is less than or equal to a specified maximum period i.e. standard time fixed.
2. Mutually exclusive projects: project having lowest payback period should be accepted.

4. Average Rate of Return \Accounting Rate of Return (ARR)

Average rate of return based upon accounting profit rather than cash flow. It represents the ratio of average annual net profit after tax to the average investment of the project.

$$\text{ARR} = \frac{\text{Average net profit after tax}}{\text{Initial investment (NCO)}} \times 100 \qquad \text{Or,}$$

$$\text{ARR} = \frac{\text{Average net profit after tax}}{\text{Average Investment}} \times 100$$

Decision rule

1. Independent project: Accept those project whose ARR is higher than the minimum rate established by the management and reject those projects which have ARR less than the minimum rate.
2. Mutually exclusive: Accept that project which has the highest accounting rate of return.

5. Profitability Index (PI)

Profitability index denotes the Benefit Cost Ratio and excess present value index. It is the ratio of present value of net cash benefit to the present value of net cash outlay.

$$PI = \frac{\text{Total Present Value}}{\text{Net Cash Outlay}}$$ Or,

$$PI = \frac{(1+k)^t}{A_o}$$

Where,

K= Cost of capital

T= No. of year

A_o= Expected cash flow

Acceptance rule

1. Independent project: All project that have I greater than 1 are accepted (IP>1).
2. Mutually exclusive: Project that has highest IP is accepted.

2.1.14.10 Planning Cash Flows

Cash is base for any business. Without cash, business cannot be survived. So, cash budget is one of the most important schedules prepared during the budgeting process. A cash budget is developed after all the operating budgets and capital expenditure outlays have been accomplished. A cash budget shows

the planned cash inflows, outflows, and ending position by interim period for a specific time span. Most companies should develop both long term and short term plans about their cash flows. The short term cash budget is includes in t he annual profit plan. A cash budget, basically, includes two parts (1) the planned cash receipts (2) the planned cash disbursement planning cash inflow and outflow given the planned beginning and ending cash position for the budget period. Planning the cash inflow and outflow will include (1) the need for financing probable cash deficit or (2) the need for investment planning to put excess cash to profitable use. The primary purposes of the cash budget are:-

1. Providing managers with advance notices of the resources at their disposal and the result they are expected to achieve.
2. Providing targets useful in evaluating departmental performance.
3. Providing warnings of potential cash shortages by time period.
4. Establishing the need for financing and\ or the availability of idle cash for investment.
5. Forcing managers to plan and coordinate cash with (a) total working capital,(b) sales revenue,(c) expenses, (d) investments and (e) liabilities .
6. Establishing a sound basis for continuous monitoring of the cash position.

2.1.14.10.1 Techniques for Improving Cash flow

Planning the cash flows of a company should include consideration of how to improve cash flow. Improving cash flow basically involves increasing the amount of available cash on a day to day basis. Some of the ways often used to improving the efficiency of the cash collection process are as follows:-

1. Review the lag from the date of sales of goods and services on credit to the mailing of (a) invoices of and (b) the first billing. To extend feasible, invoices should be designated to also be the first billing to encourage immediate payment by the customer. The time lag here can avoid a significant adverse affect on early collection.

2. If cash discount are given to customers for early payment, review their effect on early cash collection and whether the discount policy is being violated in the company (i.e. allowing the discount after its expiration date) alternatively, if discounts are not given, does inflow is company assess an interest penalty for late payment? How much cash inflow is lost by not charging for late payments?
3. Review the credit granting process to determine whether bad credit risks and collection screened out. Also, are delinquent receivable being identified early and collection action taken before the receivable becomes an uncollectible (i. e. a bad debt)?
4. Consider ways to decrease the time between the date that customers pay by check and the date that cash is available for user in the company's bank account. This time is called float and it may vary from one day to ten days. Float can be very costly because (a) the cash inflow is slow and (b) the opportunity to earn interest on the cash during the float period is lost. The float lag can be minimized by techniques such s the following:-
    i. Use lockbox system- the purpose of lockbox system is to reduce the float time of cash from the customer to the company.
    ii. Establish bank accounts in outlying areas where a designated company employee receives the customer's payments and immediately deposits the checks in the bank account.
    iii. Decrease the check- processing time within the company and make daily night deposit of all cash checks received during the day.
    iv. Promoter timely and frequent billing on all receivable. Do not use month end billing, bill immediately after sales.

A company should develop a specific policy about the investment of temporarily idle cash. The policy should be specific about such issues as (a) types and mix of acceptable securities, (b) monthly reporting and monitoring of the portfolio, and (c) safeguarding and disposal of temporary investment.

2.1.14.11 Completion and Application of the Managerial Budgeting

2.1.14.11.1 Completion of Managerial Budgeting

The development of an annual profit plan ends with the planned income statement, the planed balance sheet and the planned cash flow statement. These three statements summarize and integrate the detail plans developed by management for the planning period. At this point in profit planning, the budget director has an important responsibility. Aside from designing and improving the overall system, the budget director has been described as adviser each responsibility center. Now the parts must be assembled into a complete profit plan.

2.1.14.11.2 Implementing the Managerial Budgeting or Profit Planning

The ultimate test of whether the effort and cost of developing a profit plan are worth whole is its usefulness to management; this is a cost benefit test. We have emphasized that a profit plan should represent potentially attainable goals, yet the goals should present challenges to the enterprise. The plan should be developed with conviction that the enterprise is going to meet or exceed all major objectives.

After approval of a profit planning the next step is its distribution to the center managers in the enterprise. Distribution instructions were illustrated as an important part of the budget manual. Recall that a limited number of copies of the plan should be prepared. Complete profit plan should be distributed to the vice- president and to the heads of certain staff groups. The guiding principle in establishing the distribution policy might be to provide one copy to each member of the management team according to his or her overall responsibilities while taking into account the problem of security.

2.14.12 Ratio Analysis in Managerial Budgeting

2.1.14.12.1 Meaning

Ratio refers to the numerical or quantitative relationship between two items or variables. It is one number expressed by dividing one items of the relationship with the other. Ratio analysis of business enterprise centers on efforts to drive quantitative measure or guides concerning the expected capacity of the firm to meet its future financial obligations or expectation. It is a very powerful tool of company's strength, weakness, opportunity and threat analysis. Hence, ratio analyses are the process of identifying the financial strengths and weakness of the firm by properly establishing relationship between the items of financial statement.

2.1.14.12.2 Ratio Analysis; Relation with Managerial Budgeting

The ratio analysis can be of invaluable aid to management in the discharge of its basic functions of forecasting, planning, co- ordination, communications and control. By an analytical study of the past performance of the business, it helps in predicting and projecting the future. It assists in communication by conveying information, which is pertinent and purposeful to those for whom it is meant. It promotes co-ordination by a study of the efficiency of the business and paves the way for effective control of business operations by undertaking and appraisal for both the physical and monetary targets. Hence, ratio analysis becomes an integral part of targets. It becomes an integral part of managerial budgeting system *(Goyal, M.M., 1997: 496).*

2.1.14.13 Cost volume Profit Analysis

Cost volume Profit analyses is a tool of management to show the relationship between the elements of profit planning. Profit planning is the function of the selling price of product, demand, variable costs, fixed costs and taxes. The whole picture of profit planning is associated with cost volume profit inter relationship. CVP analyses assumes that under constant underlying conditions, CVP analyses can be used for the analyses of break even volume, break even analyses and contribution margin analyses for profit planning. This assumption of constant underlying condition and the short term relationship have been

criticized by the many all thorns of financial management and accounting. With the help of CVP management require careful analyses of cost behavior in relationship to output volume.

2.1.14.13.1 Break- even- point Analysis

Breakeven point is that point which breaks the total cost and the selling price evenly to show the level of output or sales at which there shall be neither profit nor loss. At this point, the incomes of the business exactly equal its expenditure. It can be determine by three techniques. They are as follows:-

1. Equation technique
2. Contribution margin technique
3. Graphic technique

Equation technique uses an algebraic equation to calculate the BEP. This is the most general form of analysis which can be applied to any CVP situation. This approach of finding out the BEP is based on the profit equations.

Sales Revenue = Fixed cost + variable cost + profit

Contribution margin is the difference between the sales revenue and variable cost of production. Contribution margin consist the fixed cost and profit. Formulae to find out BEP are mentioned below:

$$\text{BEP (in unit)} = \frac{\text{Fixed Cost}}{\text{CMPU}} \qquad \text{And,}$$

$$\text{BEP (in Rs.)} = \frac{\text{Fixed Cost}}{\text{CM Ratio}}$$

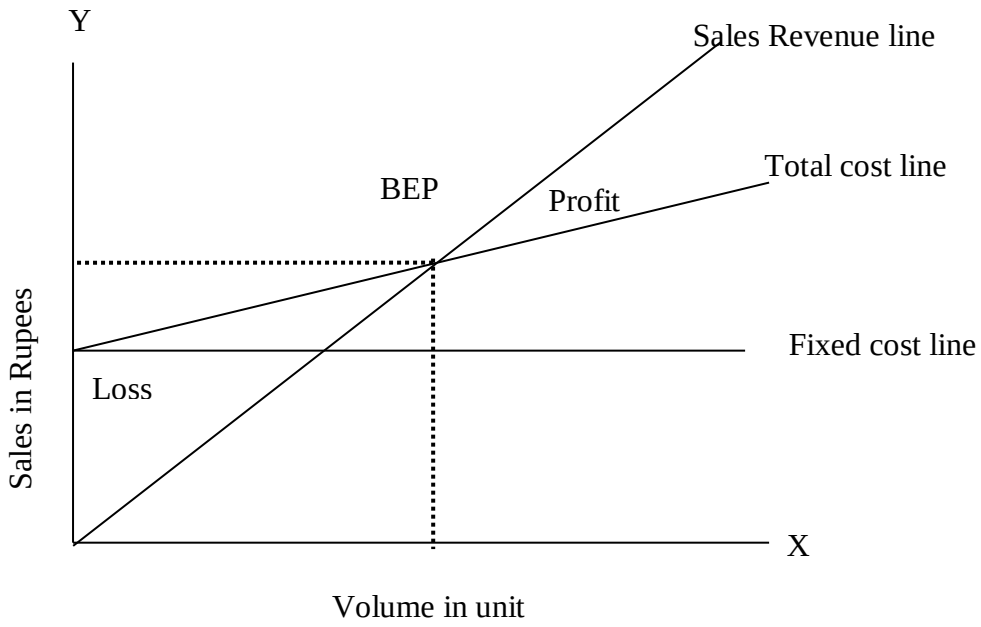
Where,

CMPU= Contribution Margin Per Unit

CM Ratio= Contribution Margin Ratio

To depict the relationship between profit and volume of activity, a cost volume profit graph is commonly used. Graphical presentation of CVP is preferred:-

1. Where a simple overview is sufficient,
2. Where there is a need to avoid a detailed, of numerical approach avocation of numerical approach is specially required if, the recipients of the information have no accounting back ground (*Munankarmi, 2002: P-144).*



In this figurer fixed cost has remained constant within the relevant range; the fixed cost curve is parallel to OX axis. Variable costs slope has up warded from the origin to right but the slope depends on variable cost ratio. The total cost curve is parallels the variable cost curve.

2.1.14.13.2 Application of Break Even Analysis in Managerial Budgeting

Break even concept can be used to formulate different policies in a business enterprise. Some of those applications are as follows:-

- Determination of profit at different levels of sales and margin of safety.

- To find the level of output to get the desired profit.
- Effect of price reduction on sales volume and changes in sales mix.
- Selection of most profitable alternative and make or buy decision and drop and \ or add decisions (*Maheshwari, 2000: 182).*

2.1.15 Performance Evaluation

Use of performance reporting for internal management is an important part of managerial budgeting systems. The performance reporting phase of a comprehensive PPC program significantly influences the extent to which the organization's planned goals and objectives are attained. To indicate the extensive reporting requirements, a business house needs to focus on performance reporting. On this regard, the following overview of financial report is presented and briefly explained:-

1. Special External Report: - These are the reports provided to government agencies, regulatory commission, creditor's investigative agencies and other external groups to make the management active.

2. Report to Owners: - This is the traditional annual report to the owners and other special reports prepared for the owners. These reports, by and large, are based on "generally accepted accounting principles'' and generally report data that have been subject to on audit by on independent CPA.

3. Internal Reports: - These confidential reports are prepared within the company for internal use only. This report is sub divided into three different sub classifications.

(a) Statistical Reports

(b) Special Reports

(c) Performance Reports

2.1.16 Analysis of Budget Variances

Comparison of actual result with planned or budgeted goals has been emphasized as an integral part of the control process. Performance report is mainly concerned with reporting of variance between actual results and planned or budgeted goals. Performance report just indicates the variances and the meaningful analysis of them if possible through the technique of variance analysis. Variance indicated through performance reports has some managerial meaning. There are numerous ways to study or investigate variances to determine the underlying cause. Some of the primary approaches are as follows:-

1. Conferences with responsibility center manager and supervisions and other employees in the particular responsibility center involved.
2. Analysis of the work situation including the flow of work, coordination of activities, effectiveness of supervision, and other prevailing circumstances.
3. Direct observation.
4. On-the-spot investigation by line managers.
5. Investigations by staff groups.
6. Internal audits.
7. Special studies.
8. Variance Analysis.

Normally, variance can take two form viz. favorable variance and unfavorable variance. When actual results are better than expected, a favorable variance arises and on the other hand, when actual results are up to standard, unfavorable variances arise. Variance analysis is helpful in controlling the performance and achieving the profits that have been planned.

2.2 Review of Previous Studies

There are many research works made as like as this topic i.e. profit planning and control. But all that research had not success to analysis the true picture of

planning of profit. The research work "Managerial Budgeting as a tool of increasing efficiency of public enterprise "which focus to all kind of budget which help to increasing overall efficiency (Profit) of this enterprise. An attempt is made here to review some of the researches, which have been submitted in profit planning and control in public enterprise.

MR. Gunaker Bhatta(1998) has made research on "profit planning a case study of Nepal Electricity Authority," submitted to Faculty of Management, Center Department for the partial fulfillment of M.B.A. on July, 1998. In this study Mr. Bhatta has pointed out the following major findings and gave recommendations:-

Findings

1. Operating profit of NEA is in negative figure. The authority has shown profit after the transfer from revaluation surplus.
2. The authority fails to maintain its periodic performance report systematically. Goal and objective are limited only to the high ranking officials.
3. Specific goal and objectives are not conveyed to lower level staffs and it denotes the absence of MBO principal of management.
4. Achievement of the authority is more variable than budgeted.
5. Even the authority is not is less from the last few year, the profit is shown only after the transfer from evaluation surplus. Expect the FY 053\054; operating profit for other years is in negative figure.

Recommendations

1. NEA should improve coordination between various directorates.
2. NEA should develop efficient system of profit collection.
3. Budget centers should be regularly monitored.

4. Leverage of the electricity should be controlled by improving meter reading and meter connection system.

MR. Yam Bahadur Limbu(1999) has made research on "An Analysis of Revenue Collection a case study of Nepal Electricity Authority," submitted to facility of management Shanker Dev Campus for the partial fulfillment of M.B.S. on 1999, July. In this study Mr. Limbu has pointed out following major finding and gave recommendations:-

Findings

1. The revenue of NEA is increasing, both total and average revenue are fluctuated.
2. The revenue generated by industry sector is greater than other and risk is also higher and the exports of power to India are very low due to insufficient production of power.
3. Revenue generation and profitability of FY 1988 to 1993 show positive correction. This period has proved that increase in revenue does not increase in profit all the times. However, there is positive profitability in the year 1994 to 1997.
4. It is observed that NEA is seriously suffering to control operating cost. Which shows NEA was not able to apply effective management in controlling operating expenses.

Recommendations

1. Improvement of efficient system of revenue collection. Mr. Limbu provides following improvement keys:-
   - Customer should be encouraged for immediate payment.
   - Different governments offices ministries expand department should pay electricity charge in time.
   - Leakage should be controlled.
   - Computerization of accounts.

- More autonomy should be provided.

2. Management of operating as well as note operating expenditures should be controlled.
3. In the present content, NEA should initiate process of privatizing of its distribution sector on a phase wise basis for providing better and efficient services to its consumers and for achieving savings in operation and maintains expenditures and reduction in system losses. The priority of areas for the implementation of privatizing process should be cased up on low revenue returns, high operation and maintains costs and system losses.

MR. Laxman Raj Kandel(2001) has made research on "An appraisal of financial performance of Nepal Electricity Authority," submitted to Faculty of Management, Shanker Dev Campus for the partial fulfillment of M.B.S. on August, 2001. In this study Mr. Kandel has pointed out following major findings and recommendations:-

Findings

1. There is no effective utilization of asset in NEA.
2. NEA has been seriously facing the problem of outstanding debt collection. The account receivable in NEA is high. So, average collection period is also high in each fiscal year.
3. High maintenance expenditures as seen in the profit and loss accounts have been an important factor in reducing the profitability of NEA.
4. Other issues are that NEA is not conducted under the business principle. The idea of privatization is coming in the electricity sector too. The Butwal power company, a private sector co; is already working in this field. Therefore there is possibility of entry of other private investor in the electricity sector in near future also. But NEA does not seem to be in a position to meet the competition with the private sector.

Recommendations

1. Importance of liquidity positions.
2. Management of operating as well as non operating expenses.
3. Efficient utilization of fixed assets.
4. Make investment in small projects and avoid big projects without prior feasibility analysis in term of finance and cost benefits.
5. Improvement's in the present accounting systems.

MR. Ghana Shyam Thapa(2004) has made research on "Profit planning in Nepalese Public enterprise a case study of Nepal Electricity Authority," submitted to Faculty of Management, Shanker Dev Campus for the partial fulfillment of M.B.S. on August, 2004. In this study Mr. Thapa has pointed out the following major findings and gave recommendations:-

Findings

1. NEA prepares both tactical and strategic profit plan but strategic plan is confined only to the level executives.
2. Achievement of capital expenditure budget is satisfactory.
3. Operating costs have not been controlled effectively during the study period.
4. NEA has not maintained sound liquidity during the study period.
5. NEA has not prepared plan and program for agriculture sector's consumption of electricity.
6. NEA has not considered demand determinates such as family income, price of electricity, connection charge, cost of alternatives available, cost of auto generation of electricity and reliability of NEA service while forecasting demand.

Recommendations

1. A systematic approach to comprehensive profit planning and control is essential. To adopt these approach existing planners should be trained

and new planner should be hired. This can contribute to increase the profitability of NEA.

2. NEA should reduce the long term loan to reduce the high interest amount. Similarly, NEA should gives emphasis in internal financing to reduce excess internal economic burden. NEA should complete its projects timely so that they will return to repay long term loan in time.
3. Cost volume profit relationship should be considered while developing the sales plan and pricing strategy. To maintain the breakeven point, NEA should control fixed and variable cost and should increase sales volume.
4. It is suggested that NEA should invest in small hydro project to ensure profitability become such projects do not require much fund and they start to provide return in investment more quickly.

2.3 Research Gap

All the research studies mentioned above are concerned with the study of profit planning system that too basically related to the planning system of Nepalese public enterprises. The findings and conclusion of all those studies like to be same. The conclusion of those researches is that there is no proper planning and controlling system in Nepalese public enterprises. Therefore this study paper is designated to highlight the "Impact of (Managerial) Budgeting in profitability of Nepalese Public Enterprises". It means, the scope of the study is to find or identify the role playing by Managerial budgeting that is adopting or practicing currently by public enterprises in increasing their efficiency. And on the other hand, for this study, I will analyze the efficiency through the volume of profit earned or profitability of Nepal Electricity Authority because of the availability of data. This study will also work to identify the various causes of generating loss, to analyze them and recommend practical suggestions to NEA.

CHAPTER – III
RESEARCH METHODOGY

3.1 Introduction

Research methodology is the way to solve the research problem in a systematic manner. It may be understood as a science of studying how research is done scientifically. Systematically and planned way of collection, analysis and interpretation of data are made to solve the research problem and accomplish basic objective of the study. This study is carried out to analyze, examine and interpret the budgeting, various functional budgets and its use in the process of planning profit and it's effectives in the public enterprise with the help of various financial statements, statistical tools etc. Research methodology is followed to achieve the objective of this research paper. The following contents of research methodology are followed to conduct the research on this subject matter.

3.2 Research Design

This study attempts to analyze and evaluate the budgeting procedure in relation to measuring analysis that is closely related with various functional budgets. In this context research design is the plan structure and strategy of investigation conceived so as to obtain answer to research questions and to control variance.

3.3 Research Population and Sample

The large group about which the generalization is made is called the population under study, or the universe and small portion on which the study is made is called the sample of the study.

Research population would be all Hydropower company of Nepal. Due to various circumstances it would not be possible to attempt all the number of research population regarding in this dissertation. To convenient the research, only one NEA will be taken for the research purpose.

3.4 Data Collection Procedure

The significance of research depends on the nature, availability and accuracy of information. Data collection is the major task of the research work. The data is collected from the secondary sources. Those sources used to collect the secondary data are as follows:

1. Published and unpublished relevant document of NEA
2. Magazines and booklets published half yearly, yearly etc by NEA
3. Official records and similar other dissertations.
4. Center Bureau of statistical.

3.5 Methods of Presentation and Analysis

The collected data are arranged and presented in proper tables and formants. After arranging relevant data, they are analyzed by applying financial and statistical tools such as ratio analysis, CVP analysis, mean, standard deviation, graphs, diagrams, correlation, time series etc. so that the finding could be presented and interpreted properly and clearly.

3.6 Research Question

This research study is concentrated to answer to the following questions to fulfill the objective of the study

1. What obstacles are being faced by NEA for not getting its objective fulfilled?
2. To what extent the procedure of budgets formulation is followed by NEA?
3. What step should be taken to improve the profitability of NEA?
4. What are the overall managerial problem and what suggestion can be recommended for their proper solution?

3.7 Period Covered

This study covered a period of the fiscal year from 061\062 to 065\066. Data were taken from NEA and the analysis was made on the basis of these five years data.

3.8 Research variables

Sales, production, overhead budget, capital expenditure, cash flow, man power budget, profit and loss, flexible budget and balance sheet of NEA are the research variable of the present study.

3.9 Data Analysis Tools

3.8.1 Accounting Analysis Tools

Various accounting tools will be applied.

3.8.2 Statistical Tools

The relationship between two or more variables can be measured by using statistical tools. In this study the following statistical tools are used.

- **Bar Diagram:**

Bar diagram are one of the easiest and the most commonly used methods of presenting the numerical data. They present the data by means of bars, or rectangles of equal width. The length of the bars represents the given figures and the width may be of any size.

- **Mean:**

The sum of all the observations divided by the number of observations is called Mean. In such cases all the items are equally important. It is usually devoted by X. It is defined by the following formula:

$$\text{Mean (X)} = \frac{\sum X}{N}$$

Where,

$\sum X$ = the sum of observations

N = no. of observation

- **Standard Deviation (S.D.):**

The standard deviation is defined as the positive root of the mean of the squared deviations from their mean of a set of values. It is also known as Root Mean Square Deviation. It is usually devoted by the Greek letter δ (Small Sigma)

The SD is calculated by the following formula:

$$SD= \sqrt{\frac{\sum(X-\bar{X})^2}{N-1}}$$

- **Coefficient of Variation (CV):**

The relative measure of dispersion based on SD is called coefficient of SD. Thus,

Coefficient of SD. $= \frac{\delta}{\bar{X}}$

100 times coefficient of SD is called coefficient of variation. It is denoted by C.V. thus,

CV = $\frac{\delta}{\bar{X}} \times 100$

- **Correlation Analysis:**

The degree of relationship between two variables at a time is called correlation. In other words, two variables are correlated in such way that if one variable changes then other variables also changes subsequently.

It can be calculated by using following formula:

$$\text{Co-efficient of correlation (r)} = \frac{\sum(X-\bar{X})(Y-\bar{Y})}{\sqrt{\sum(X-\bar{X})^2 \sum(Y-\bar{Y})^2}}$$

The correlation coefficient measures the degree of correlation between Y on X. It should be between +1 and -1. If not there is no correlation between two variables.

- **Coefficient of determination (r^2):**

A meaningful analysis is available from the square of correlation coefficient (r^2), which is called the coefficient of determination and calculated using the following formula:

Co-efficient of determination (r^2) = r x r

Probable Error (P.E.) = $0.6745 \times \frac{1-r^2}{\sqrt{N}}$

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

4.1 Sales Budget of NEA

NEA has the practice of preparing both short and long term budgets. According to the nature of customer, NEA has categorized it's consumers in many types, like wise; domestic, commercial, industrial and so on. NEA has been preparing sales budget in units and rupees from its earlier stage of budgeting.

The table 4.1 shows the budgeted sales and achievements in units as well as in rupees from the fiscal year 2061/062 to 2065/066.

Table 4.1

Sales Budget and Achievement

From F/Y 2061/062 to 2065/066

Fiscal Year	Unit in Million			Rs in Million		
	Budgeted	Actual	Achievement %	Budgeted	Actual	Achievement %
2061/062	1556.556	1407.127	90.40	9124.191	8377.832	91.82
2062/063	1685.487	1534.313	91.03	10515.190	9687.645	92.13
2063/064	1804.900	1696.816	94.02	12238.800	11237.491	91.82
2064/065	1906.622	1795.233	94.16	12825.732	11992.606	93.50
2065/066	1988.850	1964.393	98.77	13275.383	13103.181	98.70
Average	1788.483	1679.576	93.68	11595.859	10879.751	93.59

Sources: - Annual Report and Budget Book of NEA, From 2061/62 to 2065/66

The table no 4.1 signifies the budgeted and the actual sales of NEA. In the FY 2061/062 the budgeted sales of NEA was 1556.556 units in million and gradually increased up to 1988.850 units in million in FY 2065/066. On the other side the actual sales of the NEA in FY 2061/062 was 1407.127 units in million and reached to 1964.393 units in million in FY 2065/066. The annual achievement is seemed to be neither less than 90.40 percent, nor more than 98.77 percent, which mean that the targeted or say budgeted sales were more

than the actual sales units. Though, the practice of achieving the target is seemed to be increasing gradually with satisfactory manner.

In the same way, the budgeted and actual sales revenue for the FY 2061/062 was Rs 9124.191 million and Rs 8377.832 million and came to Rs 13275.383 million and Rs 13103.181 million respectively in FY 2065/066. It shows us the trend of continuous increment in comparison to previous years. The highest achievement among the above mentioned data is 98.70 percent of FY 2065/066.

In order to find out the nature of variability of budgeted and actual sales of different years, it is necessary to find out the different statistical calculations such as arithmetic mean, standard deviation and co-efficient of variance. The detail results of those statistical tools in case of NEA as per the scope of our study are presented in Appendix 1. The summaries of those results are as follows: -

Table 4.2

Relationship of Budgeted and Actual Sales

Statistical Tools	Budgeted Sales (Unit in millions)	Actual Sales (Unit in millions)
Mean ($\overline{X}$)	1788.483	1679.576
Standard deviation (σ)	154.124	195
C.V.	8.618%	11.61%

Sources: - Appendix 1

The table no. 4.2 shows the results of statistical calculations. The calculated mean of budgeted sales is 1788.483 unit in million where as of the actual sales is 1679.576 unit in million. Coefficient of variations of budgeted sales is 8.618 percent and of actual sales is 11.62 percent. The variation of actual sales is greater than that of budgeted sales due to the high fluctuation in the FY

2064/065 and 2065/066. The deviated value of actual sales is 195 which is greater than the standard deviation of budgeted sales i.e. 154.124 units in million. We can also present the above data with the help of following figure:

Figure 4.1

Actual sales unites of NEA

From FY 2061/062 to 2065/066

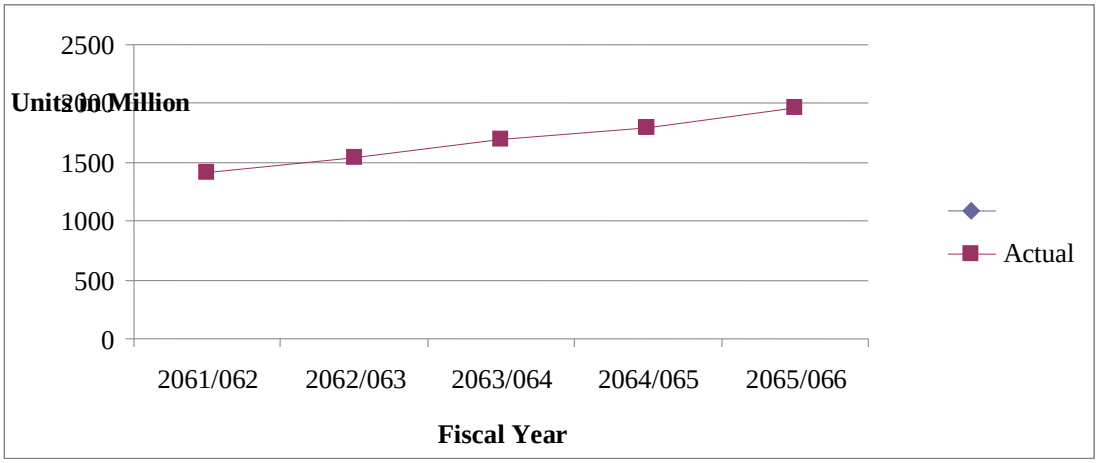
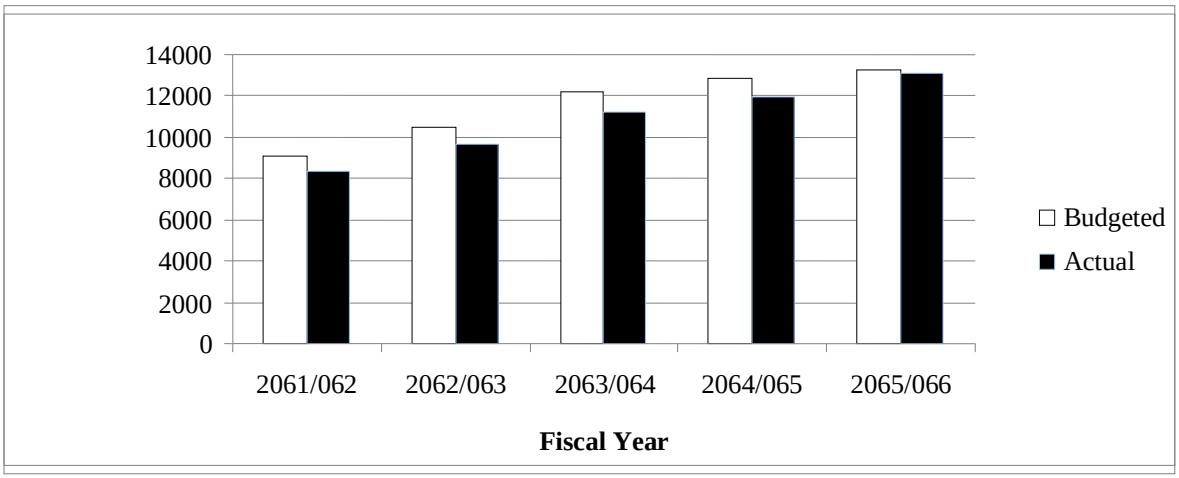


Figure No 4.2

Budgeted and actual Sales Revenue of NEA

From FY 2061/062 to 2065/066



The above graphical presentations also justify the gradual increment of budgeted as well as actual sales during the period.

Another statistical tool to analyze the relationship between actual and budgeted sales is correlation of coefficient. It can be find with the help of Karl Pearson Coefficient of Correlation and is donated by (r). The coefficient of correlation measures the degree of association between budgeted and actual figure. If an actual sale is as like as budgeted, it is proved that there is positive correlation and vice-versa. To find out of the value of (r), the budgeted sales is to be assumed as independent (X) and actual sales as dependent variable (Y).

The calculated value of correlation (r_{ay}) is 0.9926 percent (See Appendex-1). It proves that there is highly positive correlation between independent and dependent variable. It means that both the actual and budgeted sales are correlated with each other by more than 99 percent. The significant correlation indicates that the actual condition and the budgeted condition of NEA are signification. For this significance of (r) should be tested by the help of probable error. By the calculation we can find out the value of probable error 0.004. It means that, only 0.4 percent of an error items are included, but the value of r is greater than the calculated Pe. Thus the value of r is significant and proved to be highly positive correlation.

Another statistical tool is regression analysis, which determines the nature of relationship among budgeted and actual sales and makes the estimate from that on that base. It can help to estimate or forecast the future sales. For this purpose, actual sales figures is to be known as dependent variable and denoted by (Y), likewise budgeted sale is to be known as independent variable, which is denoted by (X). The regression line of actual sales on budgeted sales (Y on X) is as below: -

$$(Y - \overline{Y}) = \frac{r_{xy(\overline{X}-X)\sigma_y}}{\sigma_x}$$

Where,

$\overline{Y}$ = 1679.564 (Unit in millions)

$\overline{X}$ = 1788.483 (Unit in millions)

σ_x = 195 (Unit in millions)

σ_y =154.124 (Unit in millions)

r_{xy} =99.26%

or, $Y - 1679.564 = \frac{0.9926(X-1788.483)x195}{154.124}$

Or, $Y - 1679.564 = 0.9926\ (X - 1788.483)$ x 1.265

Or, $Y = 1.256X - 566.125$

Above regression equation shows that there is perfect correlation between actual and budgeted figure. The actual sales are not greater than budgeted figure. Change in independent variable (X) by one unit will generate the change in dependent variable (Y) by 1.256.

With the help of this regression equation, the actual sales can be estimated with the given value of budgeted sales. If the budgeted sales FY 2065/066 is 2116.5096 units in million, actual sales will be as follows: -

The expected value of actual sales (Y) $= 1.256$ x $2116.5096 - 566.125$

$= 2092.211$ million units

Likewise, another important tool is least square method. It is also known as time series analysis and an important tool for the study of trend of actual sales. A straight-line trend will show the relationship between year and actual sales of the relevant year. To fit this straight-line trend, the time factor should be

considered as an independent factor and sales as a dependent factor for the time. The formula can be expressed in the following way: -

$$Y = a + bx$$

Where,

Y= Actual sales figure

x= Time

a= Fixed value

b= Variable value

Calculation of straight-line trend by least square is shown below:

Table 4.3

Fitting straight-line trend by least square (Unit in millions)

From FY 2061/062 to 2065/066

FY	Actual sales (Y) (Unit in millions)	X Year's mid time	X^2	XY
2061/062	1407.127	-2	4	-2814.254
2062/063	1534.313	-1	1	-1534.313
2063/064	1696.816	0	0	0
2064/065	1795.233	1	1	1795.233
2065/066	1964.393	2	4	3928.786
	∑Y=8397.882		∑X2=10	∑XY=1375.452

Sources: - Annual reports of NEA

Here, 2063/64 is assumed to be the base year and that's why the value of 'X' is zero in this particular year. The value of 'X' is negative before 2063/064 and positive after 2063/064 year.

Filling the straight line trend,

$$Y = a + bx$$

Where,

$$a = \frac{\sum Y}{N} = \frac{8397.882}{5} = 679.756$$

$$b = \frac{\sum XY}{\sum X2} = \frac{1375.452}{10} = 137.545$$

Putting the value of straight line equations,

$$Y = 1679.576 + 137.545X$$

Above calculation says that if the trend of the previous year's remains constant, the sales will be increased by 137.545 million units year by year and otherwise it will be impossible.

With the help of this equation, we can estimate the value of sales for fiscal year 2066/067. The value of X for the year 2066/067 is 3.

Actual sales for 2066/067 is,

Y=1679.576+137.545 X 3

$= 2092.211$ units in million.

If the past trend is not changed, actual sales of 2066/067 will be 2092.211 million units. The actual and budgeted sales of NEA of the fiscal year 2065/066 are as follows: -

Table 4.4

Summary of Sales budget and Achievement of the fiscal year 2065/066

Category	Budgeted (unit and Rupees in millions)			Actual (unit and Rupees in millions)		
	Rate	Unit	Amount	Rate	Unit	Amount
Domestic	6.78	750	5082.818	6.7	758.189	5079.866
Non commercial	9.45	112	1058.150	9.42	100.543	947.115
Commercial	9.35	107	999.717	9.29	109.308	1015.471
Industrial	6.35	725	4605.914	6.35	764	4851.40
Water supply & Irrigation	4.92	53	260.676	4.80	49.98	239.97
Street light	5.7	60	342.298	5.75	54.861	315.451
Temporary supply	13.5	0.350	4.725	14	0.393	5.502
Transport	5.26	7	36.806	5.25	5.803	30.466
Temple	5.07	4.5	22.799	5.04	4.58	23.083
Community sales	3.5	6	21	3.55	6.034	21.421
Total (internal supply)	-	1824.85	12435.703	-	1853.691	12529.745
Bulk supply (India)	-	164	839.680	-	110.702	573.436
Total	**-**	**1988.85**	**13275.383**	**-**	**1964.393**	**13103.181**

Sources: - Annual Report and Budgeted Book o f NEA, 2065/066

The table no 4.4 shows the summary of sales budget and the actual achievement of NEA during fiscal year 2065/066. The budgeted or say targeted sale of the period was 750 million units at Rs. 6.78 million per million unit, which is in total amounted to Rs. 5081.818 million rupees for domestic sector. For non-commercial sector, the budgeted sales were 112 million units at Rs. 9.45 million per million-unit, which is in total amounted to Rs. 1058.150 million. On the other hand, the actual domestic sales were 758.189 million units at the rate of Rs. 6.70 million per million units and the total amount came to Rs. 5079.866 million. Likewise for non-commercial sector actual achievement were 100.543 million units at the rate of Rs. 9.42 million per million units and in total amounted Rs. 947.115 millions. For commercial sector, the sales were budgeted of 107 million units at the rate of Rs 9.35 where

the actual achievement was 109.387 million units at the rate of Rs. 1015.471 millions. NEA budgeted sales for industrial sector was 725 million units at the rate of Rs. 6.35 per million-amounted Rs 4605.914 millions. But the actual sales units were 764 million at the rate of Rs. 6.35 per million and amounted Rs. 4851.04 millions in total. For water supply and irrigation, budgeted sales of NEA was 53 million units at the rate of 4.92 but the actual sales was 45.58 at the rate of Rs.4.80 and came to the amount of Rs. 239.97 millions in total and so on. In the same way, the budgeted and actual export especially to India was 164 and 110.702 million units respectively. The actual figure came to Rs 573.43 million. The budgeted and actual sales condition for each sector are related and forging together for each component.

In conclusion, from the above study in relation to the sales budget of NEA, we can trace out the following points: -

1. NEA has followed tactical as well as strategic sales plan. The tactical sales plan is preparing for external purpose and strategic sales plan is for internal purpose.
2. Small Pe indicates the high positive correlation between actual and budgeted sales unite in significance.
3. Regression equation shows negative autonomous sales units. But the value of X (budgeted sales) is positive that shows the positive relationship with dependent variable (Y).
4. The trend line is increasing year by year that shows the progress of NEA.
5. The overall budgeted sales is not found fluctuating within the period covered by the study, but the actual sales unit under FY 2064/065 to 2065/066 is fluctuating and thus the variation has occurred.

4.2 Production Budget of NEA

Production budget is the second step for the development of profit plan. Without preparing the production budget, the overall profit plan will not assume to be completed. It is prepared on the basis of sales budget that mean the sales budget determines the volume of the production budget. In that respect, at first, sales budget needs to be much more realistic.

NEA is a public utility concern. It prepares the power generation as well as purchase budget instead of preparing a production budget. In terms of hydropower production, such a company cannot hold opening and closing inventory as all of we know that the power cannot be stored at any cost. NEA has the practice of preparing production budget (generation and purchase budget) for each fiscal year. The overall responsibility for the preparation of production budget goes to production director.

The following table shows the detailed production target and the achievement of NEA from FY 2061/062 to 2065/066:

Table 4.5

Budgeted and Actual Production

From FY 2061/062 to 2065/066

(Unit in millions)

Fiscal Year	Budgeted Production	Actual Production	Achievements %
2061/062	1605.81	1868.42	116.35
2062/063	2003.880	2066.45	103.12
2063/064	2149.00	2261.13	105.22
2064/065	2469.718	2380.89	96.4
2065/066	2565.806	2642.75	102.99

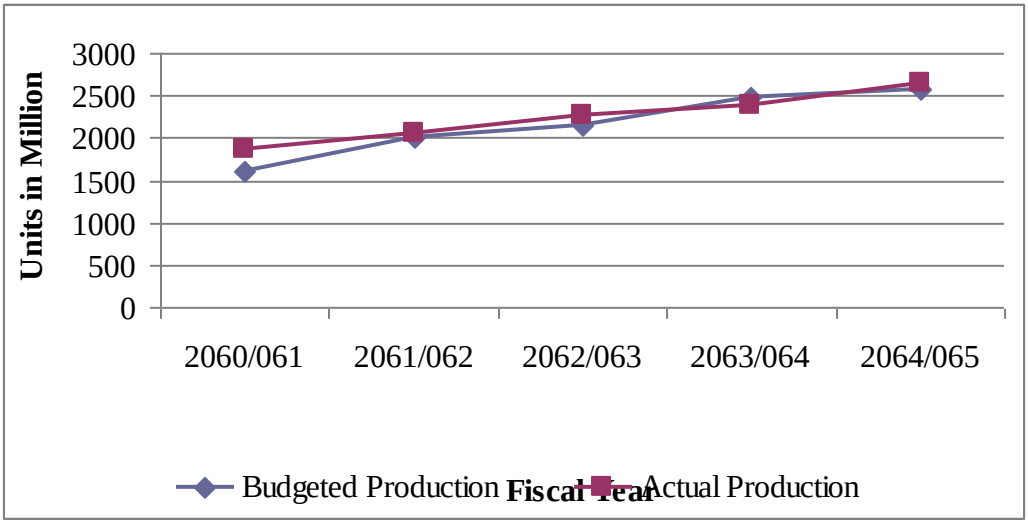
(Sources*: - Annual Report and Budget Book of NEA, from 2061/062 to 065/66)*

The table no 4.5 shows the overall production budget and the actual condition. In the FY 2061/062, the budgeted production was 1605.81 million units where as the actual production was 1868.42 million units. In the FY 2061/062 the whole achievement of NEA was 116.35 percent, which is favorable for the Authority. Likewise in the FY 2062/063 budgeted production was 2003.880 million units and the actual production was 2066.45 million units, which was 103.12 percent and so on except for the FY 2064/065. In case of FY 2064/065, the actual achievement was only 96.40 percent either due to system error, or over ambitious budget it-self and thus it can be taken seriously. Such a fluctuation shows an inefficiency of the entire company in the place of budgeting as well as performance. In spite of the fact, the actual and the budgeted production volume of NEA is increasing continuously that can be taken as a positive part.

Figure 4.3

Budgeted and Actual Production

From FY 2061/062 to 2065/066



The graphical presentation of the above data has shown the volume of actual and budgeted production, which is increasing continuously in a nearly constant manner throughout the FY 2065\066.

In order to find out the nature of variability of budgeted and actual production of different years, it is necessary to find out the different statistical calculations such as arithmetic mean, standard deviation and co-efficient of variance of actual and planned production figure of NEA for the period covered by the study i.e. five years. The detail results of those statistical tools are presented in Appendix 2. The summaries of those results are as follows: -

Table 4.6

Relationship between Budgeted and Actual Production

Statistical Tools	Budgeted Production (Unit in millions)	Actual Production (Unit in millions)
Mean ($\overline{X}$)	2158.84	2243.928
Standard deviation (σ)	344.157	264.809
C.V.	15.94%	11.801%

Source:-Appendix 2

The table no 4.6 shows the average budgeted production and the average actual production of NEA. According to the above table, the average budgeted and the average actual production is 2158.84 million units and 2243.928 million units respectively. More deviation is occurring into the budgeted figure in comparison to the figure of the actual production. Co variance of budgeted production is 15.94 percent and the actual production is 11.80 percent. More variation takes place on budgeted figure than the actual. Over ambitious budget can be taken as one of the main reason for generating such fluctuation.

The relation between dependent and independent variable is positive. The value of r is 0.9653 (App.2). It means that the budgeted and the actual production figure have the positive correlation of 96.53 percent. The obtained positive correlation has 0.020 probable error (PEr) and it indicates a minor error between to two figures.

We can use the regression analysis method as a tool to find out and to analyze the relationship that exists between the earlier said figures. It can also help to estimate or forecast the future production for the upcoming years. For this purpose, actual production figure is to be denoted by (Y), which is known as a dependent variable. Likewise, budgeted production is to be denoted by (X), which is known as an independent variable. The regression line of actual production on budgeted production (Y on X) is presented as follows: -

$$\left(Y - \overline{Y}\right) = \frac{r_{xy(\overline{X}-X)\sigma_y}}{\sigma_x}$$

Where,

$\overline{Y}$= 2243.928 (Unit in millions)

$\overline{X}$= 2158.84 (Unit in millions)

σx= 344.157 (Unit in millions)

σy = 264.809 (Unit in millions)

rxy = 96.53%

$$\text{Or, } Y - 2243.928 = \frac{0.9653(X-2158.84)x264.809}{344.157}$$

$$\text{Or, } Y - 2243.928 = 0.9653\,(X - 2158.84) \text{ x } 0.769$$

$$\text{Or, } Y = 0.743X + 641.418$$

Above regression equation shows that there is perfect correlation between actual and budgeted figure. Change by one unit in independent variable brings 0.743 percent increment in the value of an independent variable.

As earlier we can also use least square method, which is also known as time series analysis for analytical study of the figures. It shows the relationship between year and actual production of the relevant year. To fit this straight-line trend, the time factor should be considered as an independent factor and

production should be considered as a dependent factor. This straight line of actual production (Y) is expressed in the following way: -

$$Y = a + bx$$

Where,

Y= Actual production figure

X= Time

a= Fixed value

b= Variable value

Calculation of straight-line trend by least square is shown below:

Table 4.7

Fitting straight-line trend by least square (Unit in millions)

From FY 2061/062 to 2065/066

FY	Actual Production (Y) (Unite in millions)	X Year's mid time	X^2	XY
2061/062	1868.42	-2	4	-3736.84
2062/063	2066.45	-1	1	-2066.45
2063/064	2261.13	0	0	0
2064/065	2380.89	1	1	2380.89
2065/066	2642.75	2	4	5285.50
	ΣY=11219.64		∑X2=10	ΣXY=1836.10

Source: - Annual reports of NEA

Here, FY 2063/064 is assumed to be base year, so value of 'X' is zero for that particular year. The value of 'X' is negative before 2063/064 and positive after 2063/064 year.

Filling the straight line trend,

$Y = a + bx$

Where,

$$a = \frac{\sum Y}{N} = \frac{11219.64}{5} = 2243.928$$

$$b = \frac{\sum XY}{\sum X2} = \frac{1836.10}{10} = 183.61$$

$$\therefore Y = 2223.928 + 183.61X$$

According to the above finding, 183.61 million units production will be increased by each year, if the trend of the past years remains constant, otherwise it is impossible.

With the help of this equation, we can estimate the production volume for fiscal year 2066/067. Let's take the value of X, 3 for the year 2066/067.

Y= 2223.928+ 183.61X 3

$= 2794.758$ million units.

It means the production volume for FY 2066/067 will be 2794.758 units in million in case of above mentioned condition.

Production budget always depends upon the sales budget. Production should be enough to meet the market demand to which we call sales. In this regard, whether the production volume meets the required sales volume or not should be studied seriously. Following is the comparative presentation table between actual sales and the production:

Table 4.8

Actual Sales and Production of NEA

From FY 2061/062 to 2065/066 (Unit in millions)

Fiscal Year	Actual sales (X)	Actual Production (Y)	Loss in %
2061/062	1407.127	1868.42	24.69
2062/063	1534.313	2066.45	25.75
2063/064	1696.816	2261.13	24.96
2064/065	1795.233	2380.89	24.59
2065/066	1964.393	2642.75	25.67

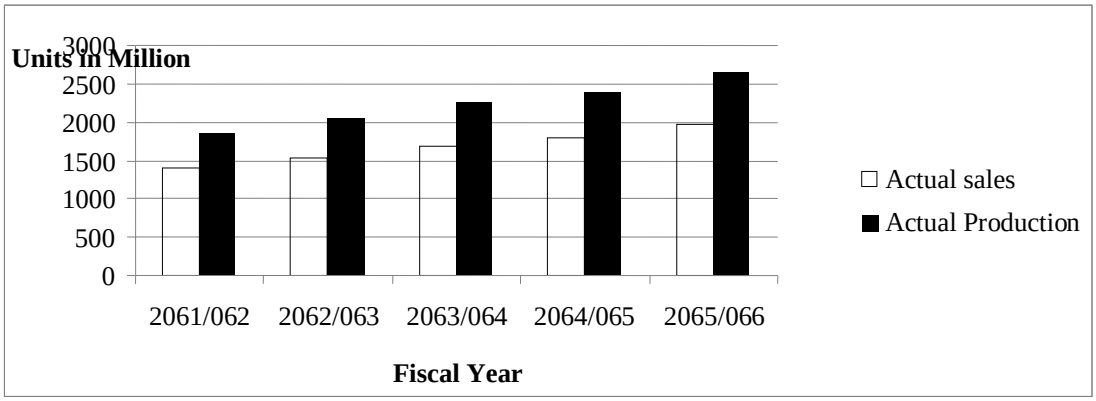
Source: - Annual Report of NEA

This table no 4.8 signifies the actual sales and actual production of NEA. In the FY 2061/062, the actual production was 1868.42 million units out of which actual sales were 1407.127 million units. According to the assumption, there must be actual production equal to actual sales but here we seemed to be vast difference due to the power leakage. In the same way in the FY 2062/063, the actual production was 2066.45 million units but actual sales were 1534.313 units. Likewise, in the FY 2063/064, actual production units and actual sales were 2261.13 million units and 1696.816 million unites respectively. In the FY 2064/065 actual production was 2380.89 and actual sales were 1795.233 million units. In the last fiscal year of study period, the actual production was 2642.75 million units where as actual sales was only 1964.393 million units and notable leakage of power.

Figure 4.4

Actual Production and Actual Sales

From FY 2061/062 to 2065/066



Sources: - Table No. 4.8

This figure shows that the actual production is always greater than actual sales. Normally, production shall always be equal to sales. But within the period covered by the study, there is vast difference between the two figures due to the power leakage. On the other hand, actual sales and actual production is increasing every year.

In order to find out the nature of variability of actual production and actual sales of different years, we shall use different statistical tools such as arithmetic mean, standard deviation and co-efficient of variance of actual sales and actual production figure of NEA for the five year from FY 2061/062 to 2065/066. The detail calculations of these statistical tools are presented in Appendix 3. The summaries of those results are given below: -

Table 4.9

Relationship of Budgeted and Actual Productions

Statistical Tools	Actual Sales (Unit in million)	Actual Production (Unit in million)
Mean ($\overline{X}$)	1679.564	2243.228
Standard deviation (σ)	195	264.809
C.V.	11.61%	11.801%

Sources: - Appendix 3

The table no 4.9 shows the averages of actual sales and actual production. Average actual sales of the study period was 1679.564 and average actual production was 2243.228 units in million. Greater deviation occurred on actual production than that of actual sales. Covariance of actual sales unites is 11.61 percent shows no more variation observed between them. The correlation value is 0.60258 (Appendix 3) which means 60.26 percent of both variables are related positively. But the probable error item observed 19.212 percent (Appendix 3) of the total items. It signifies that there arises a greater error item to prove no significance relation between them.

In conclusion, from the above study in relation to the production budget of NEA, we can trace out the following points: -

1. NEA prepares both short term and long term production plan and it is entirely based on sales budget. Long-term plan is always ruled by the government acts.

2. Small Pe item denotes the positive correlation between budgeted and actual production.
3. The regression analysis shows the positive relationship between budget and actual production.
4. Actual sales are less than actual production. It indicates that there are power losses because of not having and efficient controlling system or an entity within the authority.
5. There is positive correlation between actual sales and actual production.

4.3 Overhead Budget of NEA

Overhead budget is prepared after preparing sales and production budget. NEA has the practice of preparing overhead budget in different names viz. distribution expenses and administrative expenses. The main objective of these budgets is to control over the factory and administrative expenses.

Though, NEA has not defined a proper system in relation to prepare overhead budget. It has accumulated all its expenditure in administrative and distribution expenses. Due to this reason it has created difficulties to analyze the overhead budget. The historical figure in relation to budgeted administrative, distribution and interest expense on long term loan is presented in the following table:-

Table 4.10

Overhead Budget of NEA

From FY 2061/062 to 2065/066 (Rs in million)

Fiscal Year	Distribution Expenses	Administrative Expenses	Interest on long-term loan	Total Overhead
2061/062	982.22i.e.32.52%	850.08i.e.28.14%	1188.20i.e.39.34%	3020.50
2062/063	1174.40i.e.38.92%	447.40i.e.14.83%	1395.50i.e.46.25%	3017.30
2063/064	1308.60i.e.27.16%	536.10i.e.11.13%	2973.40i.e.61.71%	4818.10
2064/065	1376.10i.e.28.33%	489.10i.e.10.07%	2991.50i.e.61.60%	4856.70
2065/066	1556.20i.e.28.86%	511.60 i.e. 9.49%	3324.60i.e.61.65%	5392.40

Sources: - Annual Reports of NEA

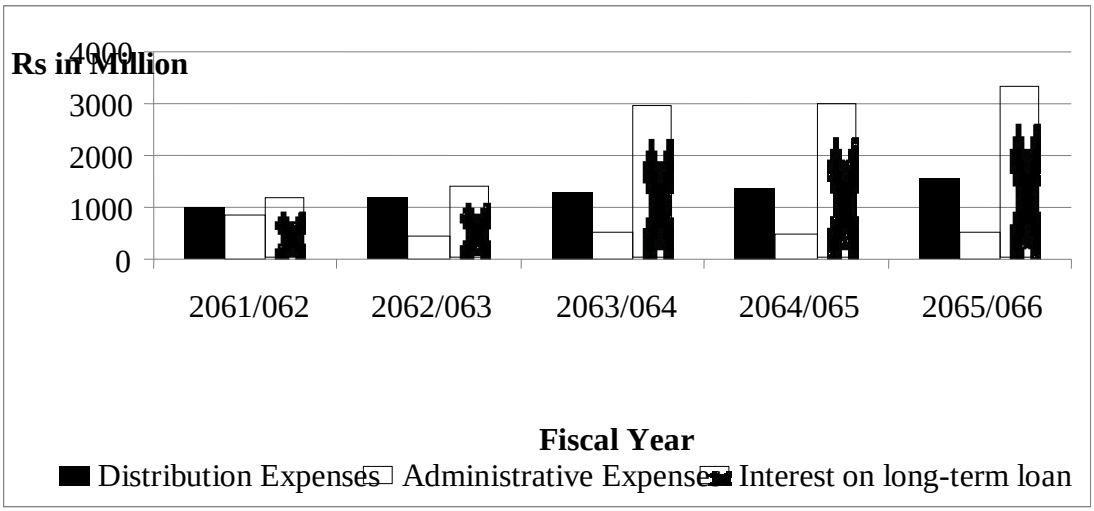
The above table is fully covered with the overhead budget figures of NEA. It shows the increasing trend of overhead expenditure in each fiscal year except in the FY 2062/063. NEA has been paying a huge amount as an interest for long term loan. Interest on long term loan is increasing rapidly year by year.

The table 4.10 can be presented in diagram as follows:

Figure 4.5

Overhead Budget of NEA

From FY 2061/062 to 2065/066



Above figure shows that the distribution expenses and interest on long term loan are increasing in a competitive way but the administrative expense is much more fluctuating. It denotes that the interest and distribution expense covers most of the percentage of total overhead of NEA. It shall pay out its long term loan as soon as possible so as to reduce the financial burden that is showing the form if interest.

4.4 Capital Expenditure Budget of NEA

Capital expenditure budget is often called capital budgeting. It is the process of planning and controlling strategic and tactical expenditure for the expansion and contraction of investment in operating assets. A capital expenditure is the use of fund to obtain operation assets that will help to earn future revenue to reduce the future costs, capital outlays are expenditure for land, building, and equipment, and for permanent additional to working capital associated with sales growth. A primary issue in controlling the actual expenditure is consistent with the plans and those funds are available when expenditure is incurred.

NEA prepares tactical and strategic capital expenditure budget. Tactical capital expenditure is prepared for one year, which is published in capital expenditure budget of NEA but strategic capital expenditure is not published. NEA capital expenditure includes purchase of building, hydro electric plan, land, equipment and other. With the help of this budget, NEA estimates its cash requirement and gets support to prepared cash budget. The following table shows the capital expenditure budget of NEA for FY 2065/066

Table 4.11

Capital Expenditure Budget of NEA

For FY 2065/066

S. N.	Components	Amount (in '000')
1.	Land	23560
2.	Buildings	33955
3.	Hydro Electric Function	6000
4.	Hydro Electric Machine	70000
5.	Heating Electric Machine	0
6.	Transmission line over 33 KV	46300
7.	Transmission line under 33 KV	26585
8.	Transmission sub station	349710
9.	Distribution line	70232
10.	Distribution sub station	267226
11.	Meter and meter check equipment	30007
12.	Customer service	3721
13.	Public lights and traffic signal	5900
14.	Parts and equipment	10065
15.	Works shop equipment	7886
16.	Vehicle and mobile plant	2575
17.	Furniture and Fixture	4454
18.	Office equipment	15124
19.	Miscellaneous/ other assets	2282
20.	Feasibility study	7300
21.	Consultancy	2450
22.	Corporate	29240
Total		**1014572**

Sources: - Budgeted Books of NEA, 2065/066

The table No 4.11 shows that capital expenditure budget of NEA for fiscal year 2065/066. In this fiscal year total budget is Rs 1014572 in thousand, which is classified various capital expenditure budget head of NEA. It shows that Rs 34971000 is classified in transmission substation which is more than other expenditure head. Likewise minimum amount is budgeted in customer services. It proved that NEA spends all most capital to increase its capacity than other services.

4.5 Cash Budget of NEA

A cash budget shows the planned cash inflows, outflows and the ending position by interim period for a specific time span. Most company should develop both long term and short term plans about their cash flows. A cash budget basically, includes two parts (1) the planned cash receipts, and (2) the planed cash disbursements. Planning of cash inflow and outflow gives the planned cash position for the budgeted period. Planning the cash inflows and outflows will include (1) the need for financing probable cash deficits or (2) the need for investment planning to put excess cash to profitable use.

NEA prepares short term cash budget with systematic way. NEA estimates its probable cash receipts and disbursements. The primary source of cash inflow of NEA is the sale of electricity and the other are income from other services, income from interest, amount received from HMG, loan and aid. Likewise, the major reason of cash outflows are capital expenditure, operation expenditure, interest on long term loan, and amount reimbursed to HMG and investment in small and major hydropower projects. The following table shows the cash budget of NEA for FY 2065/066:

Table 4.12

Cash Receipts and Disbursement Budget of NEA (for FY 2065/066)

(Rupees in Thousand)

Particular	**Amount**	**Amount**
Opening balance		633990
Receipts		
Electricity sales	11569334	
Other service and interest	627000	
Receipts from HMG		
a) Electricity charge accruals and	300000	
street light		
b) Development budget		
1.Local sources	990000	
2. Foreign sources	4030000	
c) Reconstruction of damage structure	100000	
Total cash available (A)		**18250324**
Disbursements		
Operating expenses	2600000	
Interest on long term loan and short term loan	1750000	
Purchase of electricity	4950000	
Royalty payment	700000	
Income tax payment	50000	
Capital expenditure payment	910000	
Reconstruction	100000	
Investment in HMG Approval project		
1. From NEA sources	1037900	
2. From HMG sources	990000	
3. From foreign sources	4030000	
Principle instalment of long term loan	600000	
Principle instalment of short term loan	600000	
Brow fund release	30000	
Net purchase budget release	90000	
Contingency	1500000	
Investment in Assets insurance fund	0	
Pension investment	50000	
Total Disbursements (B)		**18644620**
Surplus/Deficit (A-B)		**-394296**

The above table shows the cash flow statement of NEA. Its budgeted total cash receipt was Rs 18250324 thousand in FY 2065/066. In the same way, the budgeted total disbursement of cash was Rs 18644620 thousand out of which, operating expense and interest on long term and short term loan covers 13.94 and 9.39 percent respectively. This condition shows the negative surplus or say deficit of Rs 394296 thousand, which is unfavorable for the NEA.

4.6 Human Resource Budget of NEA

Human being is the most important asset of an organization. No, company can operate without manpower. Effective plan and systematic control over manpower is essential to achieve the organization goals. Human resource plan refer the area of recruitment, personal needs, training, job description and evaluation, union negotiation, wage, salary and performance appraisal.

NEA has established human resources department that has been entrusted with following functions under NEA's present corporate structure.

1. Manpower planning
2. Staffing
3. Training and development career management
4. Employees record keeping
5. Disciplinary action
6. Administrative management

The following table shows the manpower plan of NEA for FY 2065/066:

Table 4.13

Human Resources Plan of NEA

For FY 2065/066

Level	Service	Approved position			Existing position			
		Regular	Pool	Total	Permanent	Monthly wage	Daily wage	Total
M D		1	0	1	1	0	0	1
G.M. / D.M.D		8	0	8	4	0	0	4
Officer level	Technical	1056	2	1058	853	15	1	869
	Non technical	483	1	484	415	1	0	416
Total		1548	3	1551	1273	16	1	1290
Asst. level	Technical	5330	173	5503	4197	435	703	5353
	Non technical	2970	293	3263	2441	280	415	3136
Total		8300	466	8766	6638	733	1118	8489
Grand Total		9948	469	10317	7199	749	1119	9779

Sources: - Annual Report of NEA, 2065/066

This above table shows the figure of total employee within NEA in existing position and approves position. In the FY 2065/066, total employees were 9779 out of which permanent employees were 7199, monthly wage receivers were 749 and daily wage receivers were 1119. Though, the total no of the employees is less than the approved position. The employees can be classified in managerial director, G.M., official level, and assistant level. The assistant level employees occupies major portion in NEA. Total no of assistant level employees were 8489, out of which 5353 employees were the area of technical and rests are of others.

Every PE is suffering from over staffing due to political interference that too is unable to do the assigned work perfectly. So, management group of NEA is suggested to create a peaceful working environment in organization to achieve objective of NEA perfectly.

4.7 Profit and Loss account of NEA

The profit and loss account of the company can be referred as a final account which summarized the incomes and gains earned and expenses incurred during the financial year. Therefore, profit and loss account is prepared to ascertain the operating results of a company in terms of net profit or loss. The profit and loss account determines net income or loss by matching incomes and expenses occurred during a particular financial year. NEA is also preparing profit and loss account at the end of every fiscal year. It shows the final conclusion of the operation of fiscal year.

The following the table of showing profit and loss account of NEA for the FY 2064/065:

Table 4.14

Details of Profit and Loss of NEA

For Fiscal Year 2065/066 (Rs. in Million)

Particulars	Amount
Sales	**12822.9**
Cost of sales	7602.7
Generation	7362
Transmission	240.7
Gross profit	**5220.2**
Other income	566.1
Distribution	1556.2
Administrative Expenses	511.6
Profit from operation	**3718.5**
Interest	3324.6
Depreciation	1838.8
Profit/Loss on foreign Exchange	50
Loss on fixed assets	0
Deferred revenue expenditure written up	350
Sub Total	**5563.4**
Profit /loss from operation including	-1844.9
Interest + Dep.	
Prior year adjustment (net)	50
Net profit/loss before tax	**-1894.9**
Provision for Tax	0
Net profit/loss after tax	**-1894.9**
Balance of profit as per last account	-3475.2
Total profit available for appropriation	-5370.1
Insurance fund	20
Profit/loss transferred to balance sheet	**-5390.1**

Sources: - Annual Report of NEA, 2065/066

The above table contains the figure of profit and loss account of NEA, which has already showed that the company is suffering from huge amount of loss

and is increasing continuously. The detail comprehensive profit and loss a\c from FY 2061/062 to 2065/066 has been shown in Appendix 4. In the fiscal year 2065/066, net loss of the company was Rs 1894.9 million. The amount has been transferred to balance sheet that's too with the loss as per last account and of insurance fund and thus came to the total amount of Rs. 5390.10 million. The following table shows the profit or loss of NEA for the FY 2061/062 to 2065/066.

Table 4.15

Profit and Loss of NEA

From FY2061/062 to 2065/066 (Rs in million)

Fiscal Year	Net profit after tax
2061/062	(51.00)
2062/063	(860.70)
2063/064	(1953.70)
2064/065	(1760.30)
2065/066	(1894.90)

Sources: - Annual Report of NEA

The table no 4.11 shows the profit and loss account, which is negative for the total study period. It tells us the unfavorable economic condition of NEA. It was seemed to Rs. 1894.90 million losses in fiscal year 2065/066. As it is a public enterprise, it is facing the political interference from the day of its formation. As system of corruption has grown strongly and overall system such as record keeping, authority delegation is based on tradition or say till now on those sectors, no scientific system has been introduced. It's property such as vehicle and other electronic devices are using by the personnel for personal use and it can be called as misuse of property. All of the above stated and many other are the reasons for generating loss year after year despite of having totally monopoly market. Use of statistical tools to analyze profit or loss of NEA is shown below.

The straight line of net profit after tax (Y) is expressed in the following way:-

$Y = a + bx$

Where,

Y= Net profit after tax figure

X= Time

a= Fixed value

b= Variable value

Calculation of straight-line trend by least square as below:

Table 4.16

Fitting straight-line trend by least square (Rs in million)

From FY2061/062 to 2065/066

FY	Net profit after tax (Y)	X Year's mid time	X^2	XY
2061/062	-51.00	-2	4	102
2062/063	-860.70	-1	1	860.7
2063/064	-1953.70	0	0	0
2064/065	-1760.30	1	1	-1760.30
2065/066	-1894.90	2	4	-3789.80
	ΣY= -6520.60		∑X2=10	ΣXY= -4587.40

Sources: - Annual report of NEA, FY 2061/062 to 2065/66

It is assumed that 2063/064 a base year, so value of 'X' is zero in this year. The value of 'X' is negative before 2063/064 and positive after 2063/064 year.

As we know,

$Y = a + bx$

Where,

$$a = \frac{\sum Y}{N} \quad = \frac{-6520.60}{5} \quad = -1304.12$$

$$b = \frac{\sum XY}{\sum X2} \quad = \frac{-4587.40}{10} \quad = -458.740$$

$$\therefore Y = -1304.12 + (-458.74)X$$

Above calculation show that Rs -1304.12 million will be increase the every year net profit after tax if trend of the past years continued in the future also, otherwise it is not possible.

With the help of this equation, it can estimate the net profit after tax for fiscal year 2066/067. The value of X for the year 2066/067 is 3.

Actual sales for 2066/067 is,

$$Y = (1304.12) - 458.740 \times 3$$

$$= \text{Rs } -2680.34 \text{ million.}$$

If the past trend is not changed, net profit after tax for FY 2066/067 will be Rs -2680.34 million.

4.8 Balance Sheet of NEA

Balance sheet is a statement having two sides containing the values of Assets and the volume of Capital and Liability. It shows the overall financial condition of an organization. NEA has the practice of preparing balance sheet at the end of every financial year. The balance sheet of 2065/066 is presented below. The detail comprehensive balance sheet from FY 2061/062 to 2065/066 has been show in Appendix 5.

Table 4.17

Balance Sheet of NEA

At the end of FY 2065/066

Particular	Amount
Capital and reserve	
Share capital	19276.8
Reserve and Accumulated profit	3950.6
Secured long term loan	49201.3
Grand Total	**72428.7**
Asset	
Fixed Assets	58747.5
Capital working in process	14259.7
Investment	**813**
Sub Total	**73820.2**
Current Asset	
Inventories	1197.8
Sundry debtors and Other Receivable	4123.3
Cash and Bank Balance	1225.4
Prepaid, Advance, loan and Deposits	2486.8
Total Current Assets	**9033.3**
Less: Current Liabilities and Provision	
Sundry creditors and payable	9949.2
Provision	715.6
Total Current Liabilities	**10664.8**
Net Current Assets	**-1631.5**
Deferred Expenditure (To be written Off)	150
Inter Unite Balance (Net)	90
Total Def. EXP & Inter	240
	72428.8

Source: - Annual report of NEA, 2065/066

The table No 4.17 shows the balance sheet of NEA for fiscal year 2065/066. The share capital was Rs. 19276.8 million, which is assumed to be sufficient if it is well managed. Reserved and accumulated profit not seemed to be immediately returned back. Secured long-term loan is appropriate for NEA and

should be properly used. Sundry creditor and other liabilities should be reduced promptly to meet the accounting norms.

Fixed assets were found of Rs. 58747.5 million. Working capital should be increased which was found Rs. 14259.7 million. Current assets were found of Rs. 9033.3 million, which is less than current liabilities. It proves the condition of current assets condition is not so good NEA. Cash and bank balance is Rs. 12254.4 million shows the idle cash holding and this should be invested for production and research work in respect of hydropower. Prepaid loan and advance should be reduced by the claim of settlement.

4.9 Analysis of Account Receivable of NEA

The following table shows the account receivable, sales revenue, and average collection period and debtor turnover as below:

Table 4.18

Account Receivable, Sales Revenue, Average Collection Period and Debtor Turn Over

From FY 2061/062 to 2065/066

Fiscal Year	Sales revenue (Rs in million)	Account Receivable (Rs in million)	Average Collection Period	Debtor Turn Over
2061/062	8377.832	1678.50	73.14 days	4.99 times
2062/063	9687.645	2284.90	86.09 days	4.24 times
2063/064	11237.491	3380.20	109.79 days	3.32 times
2064/065	11992.606	3735.70	113.69 days	3.21 times
2065/066	13103.181	4123.30	114.86 days	3.18 times

Sources: - Annual Report of NEA up to Fiscal Year 2065/066

The above table no 4.18 shows the sales revenue, account receivable, average collection period and debtor turnover of NEA from FY 2061/062 to 2065/066.

The average collection period and debtor turnover has been calculated by using the following formula:

$$\text{Average collection period} = \frac{\text{Days in a Year}}{\text{Debtor turnover}}$$

$$\text{i. e. } \frac{365 \text{ days}}{\text{Debtor turnover}}$$

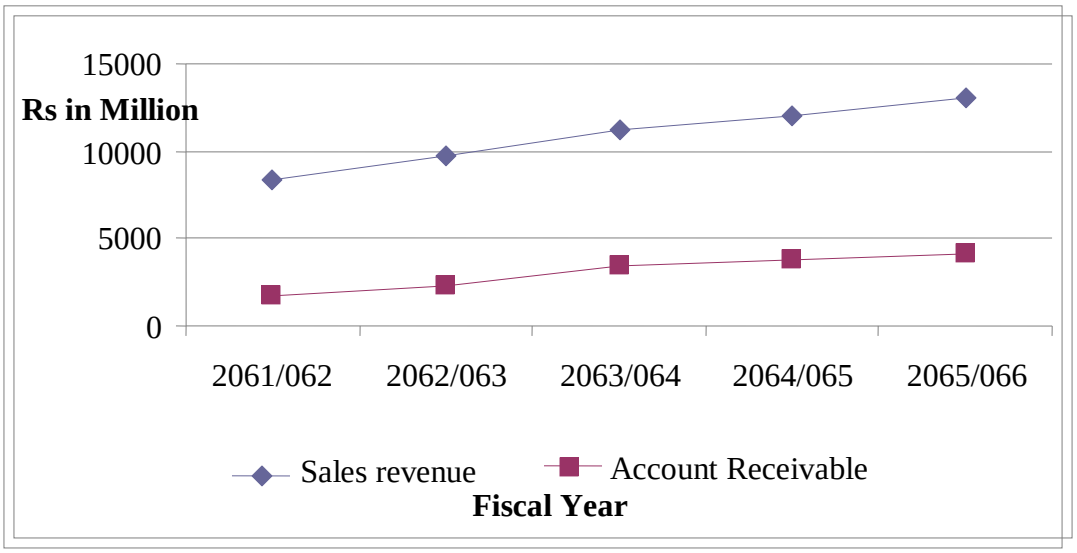
$$\text{Debtor turnover} = \frac{\text{Sales}}{\text{Closing debtors}}$$

The table also shows that, account receivable is in increasing trend competitively with the increment of sales revenue. But debtor turnover is constant to some extent which reflects the inefficiency of NEA in regards to receivable management. Only in the fiscal year 2065/066, debtor turnover has decreased to some extent in comparison to the previous years.

Figure 4.6

Account Receivable and Sales Revenue of NEA

From FY 2061/062 to 2065/066



Above figure shows the increasing trend of sales revenue as well as of account receivable. It has proved that the sales and account receivable have a direct relationship and thus flow in the same direction.

4.10 Analysis of Power Loss of NEA

Power loss is the most important problem of NEA. Each and every time, power is not utilizing fully. Normally, 15% of electricity out of actual production is considered to be loss. Leakage, outage and theft are major causes of power loss. The following table shows the power loss scenario of NEA:

Table 4.19

Power loss of NEA

From FY 2061/062 to 2065/066

(Unit in Million)

FY	Total power available	power loss	% of loss in total power available
2061/062	1868.42	461.293	24.69
2062/063	2066.45	532.137	25.75
2063/064	2261.13	564.314	24.96
2064/065	2380.89	585.657	24.59
2065/066	2642.75	678.357	25.67

Sources: - Annual Reports of NEA

This table shows the power loss units and percentage of loss on the base of total power available of NEA. Power loss percentage is increasing continuously expect in case of fiscal year 2063/064 and 2064/065. In FY 2061/062 total power loss is 461.293 million units and in FY 2065/066 it reached to 678.397 million units. It concludes the inefficiency of NEA in power distribution sector.

4.11 Financial Analysis

Financial analysis is the process of identifying financial strength and weakness of the firm by properly establishing relationship between the item included in balance sheet and the profit and loss account. Financial analysis can be undertaken by the management of the firm and the parties outside the firm viz. owners, creditors, investors and others. The nature of the analysis may be differed depending upon the purpose of the analyst. On the other hand it is important to measure the firm's liquidity, profitability, solvency position and to assess the firm's operating efficiency. It is their overall responsibility to see that whether the resources of the firm are used most efficiently and financial condition of the firm is sound, so that the financial analyst tries to seek the answer to the following question:

1. Is the firm in a position to meet the current obligations?
2. What sources of the long-term finance are employed by the firm and what is the relationship between them? Is there any danger to the solvency of the firm due to the employment of the excessive debt?
3. How efficient does the firm use its assets?
4. Is the earning of the firm adequate?
5. What is the position of return on investment and for capital employed?

There are many techniques used in analyzing the financial statement, one of them is the ratio analysis. Ratio analysis is one of the powerful tools of the financial analysis. A ratio is defined by "the indicted quotient of two mathematical expressions" and the relationship between two or more things. In financial analysis ratio is used as an index for evaluating the financial position and performance of the firm. The absolute accounting figures reported in the financial statement do not provide meaningful answer tending of the performance and financial position of a firm. At last, ratio may be used to evaluate the company's liquidity, efficiency, leverage and profitability .The ratio may be classified as follows:-

1. Liquidity Ratio

2. Leverage Ratio

3. Profitability Ratio

4. Activity Ratio

1. Liquidity Ratios

Liquidity ratio measures the ability of the firm to show its current or short term obligation. In fact, analysis of the liquidity needs the preparation of the cash flow statement. Liquidity ratio, by establishing the relationship between cash and other current assets to the current obligation provide a quick measure of the liquidity. A firm should ensure that it does not suffer from the lack of liquidity as well as does not have more liquidity. The failure of the company to meet its obligations due to lack of sufficient liquidity will result in bad credit rating, loss of creditor's confidence, or even in law suit resulting in the disclosure of the company. In case of NEA, current and quick ratios are used to judge its liquidity position.

A. Current Ratio of NEA

Current ratio is also known as short term solvency ratio or working capital ratio. This ratio is used to assess the short term financial position of NEA. In other word, it is an indicator of firm's ability to meet its short term obligation. This is calculated by using the following formula:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Table 4.20

Calculation of Current Asset Ratio of NEA

From FY 2061/062 to 2065/066 (Rs in Million)

Fiscal Year	Current Assets	Current Liabilities	Ratios
2061/062	6313.60	6113.70	1.033:1
2062/063	7322.00	5948.10	1.231:1
2063/064	7690.50	8198.10	0.938:1
2064/065	7883.40	10389.20	.0759:1
2065/066	9033.30	10664.80	.847:1

Sources: - Annual Reports of NEA

The table no 4.20 shows the current ratios of NEA for different period. In FY 2061/062 current assets ratio was 1.033:1 and in FY 2065/066 it was 0.0847:1, which clear says that current ratio of the enterprise is not good. It seems that current liabilities are more than current assets except in case of FY 2061/062 and 2062/063. It is being failure day by day in maintaining current ratio effectively. The highest current ratio was 1.231 and the lowest was 0.759. But in normal practice, 2:1 ratio is considered as good.

B. Quick/ Acid Test Ratio of NEA

The quick/acid test ratio is the more refined measure of the NEA liquidity. This ratio establishes a relationship between quick or the liquid assets and current liabilities. An asset is liquid, if it can be converted in to the cash immediately or reasonably soon without the loss of any value. However, although it is used to test the short term solvency or liquidity position of the firm, it is more stringent measure of liquidity than that of current ratio.

This ratio can be calculated by using the formula given below:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Table 4.21

Calculation of Quick Asset Ratio of NEA

From FY 2061/062 to 2065/066 (Rs in Million)

Fiscal Year	Quick Assets	Current Liabilities	Ratios
2061/062	2717.80	6113.70	0.44:1
2062/063	2949.50	5948.10	0.50:1
2063/064	4456.40	8198.10	0.54:1
2064/065	4772.10	10389.20	0.46:1
2065/066	5348.70	10664.80	0.50:1

Sources: - Annual Reports of NEA

This above table has shown the quick assets ratio of NEA. NEA does not have satisfactory quick ratio in any fiscal year. In FY 2061/062 it was 0.44:1 which

less than its standard rate. Likewise, all other fiscal year have not maintained its satisfactory ratio. In normal practice the ratio 1:1 is considered to be good. It is clear that NEA does not have enough working capital. On the other hand it seems the fluctuating trend of quick ratio. At the last of the study period i.e. FY 2065/066 quick ratios was only 0.50:1 or only fifty percent.

2. Leverage Ratio

To analyze the long term financial position of the any business organization, we can also calculate leverage ratio. This ratio can also be called long term slovenly ratio or capital structure ratio. The term solvency implies the ability of a company to meet the payment associated with its long-term debts.

A. Total Debt Ratio of NEA

This ratio shows the relationship between total debt and total capital of NEA. The frequently used leverage ratio by NEA is total debt turnover. This ratio can be calculated by using the formula given below:

$$\text{Total Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Debt+Net Worth}}$$

Table 4.22

Calculation of Total Debt Ratio of NEA

From FY 2061/062 to 2065/066 (Rs in Million)

Fiscal Year	Total Debt	Total Debt+ Net Worth	Ratios
2061/062	42821.3	68674.20	0.62:1
2062/063	47422.6	72177.70	0.66:1
2063/064	51984.1	74545.30	0.69:1
2064/065	55641.2	78407.7	0.71:1
2065/066	59866.1	83093.50	0.72:1

Sources: - Annual Report of NEA

Above table No 4.22 signifies that debt ratio of NEA. The debt ratio of NEA can be considered as satisfactory by finding out the above result.

3. Activity Ratios

Activity ratios are employed to evaluate the efficiency with which the firm managers utilize its assets. This ratio is also called turnover ratio because it indicates the speed with which assets being converted or turned over into sales. Activity ratio, thus, involves a relation between sales and the various assets, and presumes that there exist an appropriate balance between sales and the various assets. Normally, NEA uses capital turnover ratio, total asset ratio; fixed assets turnover ratio and working capital turnover.

A. Capital Employed Turnover Ratios

Capital employed turnover ratio establishes the relationship between the amount of sales and capital employed. It shows how efficiently capital employed has been utilized in generating its sales revenue. This ratio can be calculated by using the formula given below:

$$\text{Capital Employed Turnover Ratio} = \frac{\text{Sales}}{\text{Capital Employed}}$$

Table 4.23

Computation of Capital Employed Turnover Ratio of NEA

From FY 2061/062 to 2065/066

(Rs in Million)

Fiscal Year	Sales Revenue	Capital Employed	Ratios
2061/062	8377.832	72428.70	0.12 times
2062/063	9687.645	68018.50	0.14 times
2063/064	11237.491	66347.20	0.17 times
2064/065	11992.606	66229.60	0.18 times
2065/066	13103.181	62560.50	0.21 times

Sources: - Annual Reports of NEA

The table no 4.23 shows the capital employed turnover ratio of NEA. These ratios are increasing in every fiscal year. In FY 2061/062, the ratio was only 0.12 times and in FY 2065/066, it came to 0.21 times. This ratio proves that

higher the capital employed turnover ratio the more efficient term of creditor's fund. It also can be considered as satisfactory by finding out the above result of NEA.

B. Total Assets Turnover Ratio

Total assets turnover ratio establishes the relationship between the amount of sales and total assets. This ratio indicates how well the NEA's total assets are being used to generate its sales. On the other hand, it also tells us to manage fixed and current assets to generate maximum sales through their proper utilization.

This ratio can be calculated by using the formula given below:

$$\text{Total Assets Turnover} = \frac{\text{Net Sales}}{\text{Total Sales}}$$

Table 4.24

Computation of Total Assets Turnover Ratio of NEA

From FY 2061/062 to 2065/066

(Rs in Million)

Fiscal Year	Sales Revenue	Total Assets	Ratios
2061/062	8377.832	67574.70	0.12 Times
2062/063	9687.645	71251.00	0.14 Times
2063/064	11237.491	73907.90	0.15 Times
2064/065	11992.606	78179.40	0.15 Times
2065/066	13103.181	82853.50	0.16 Times

Sources: - Annual Reports of NEA

Above table No 4.24 shows that total assets turnover ratio of NEA. This ratio is a significant ratio since it shows that NEA's ability of generating sales from all the financial resources committed to firm. In FY 2061/062 total assets turnover is 0.12 times and increasing year by year. It has proved that it is utilizing its available assets properly. It is suggested that NEA should use its total assets more than now to increase its existing revenue.

C. Fixed Assets Turnover Ratio

The fixed assets turnover ratio measures the efficiency with which the firm is utilizing its investment in fixed assets. It also indicates the adequacy of sales in relation to the investment in fixed assets. The fixed assets turnover ratio is calculated by dividing sales by net fixed assets (i.e. by the depreciated value of fixed assets).

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Net Fixed Assets}}$$

Table 4.25

Computation of Fixed Assets Turnover Ratio of NEA

From FY 2061/062 to 2065/066 (Rs in Million)

Fiscal Year	Sales Revenue	Fixed Assets	Ratios
2061/062	8377.832	37104.00	0.23 Times
2062/063	9687.645	58538.20	0.17 Times
2063/064	11237.491	56949.00	0.20 Times
2064/065	11992.606	58963.40	0.20 Times
2065/066	13103.181	58747.50	0.22 Times

Sources: - Annual Reports of NEA

This table no 4.25 shows the fixed assets turnover ratio of NEA. In FY 2061/062 the ratio was 0.23 times, like wise in last FY 2065/066 is 0.22 times. It shows the increasing trend of the ratio continuously.

4. Profitability Ratio

A company should earn profit to survive and grow over a long period of time. Profit is essential, but it would be wrong to assume that every action initiated by management of a company should be aimed at maximizing profit. Though, the profitability shows overall efficiency of a company. Profitability ratios are measure of its overall efficiency. Generally, profitability ratios can be calculated in terms of the company's sales, investment and earnings and

dividends. Applying the profitability ratio, profit position of NEA can be found. The following are the important profitability ratios in relation to NEA:-

A. Net Profit Ratios

This ratio is also called net profit margin. This ratio measures the overall profitability of a business by establishing the relationship between net profit and net sales. Net profit is obtained by subtracting operating expenses and income tax from the gross profit. The net profit ratio is measured by dividing net profit after tax by sales as shown below:

$$\text{Net Profit Ratio} = \frac{\text{Net profit after tax}}{\text{Net sales}} \times 100$$

Table 4.26

Computation of Net Profit Ratio of NEA

From FY 2061/062 to 2065/066

(Rs in Million)

Fiscal Year	Sales Revenue	Net Profit	Ratios
2061/062	8377.832	(51.00)	(0.61%)
2062/063	9687.645	(860.70)	(8.88%)
2063/064	11237.491	(1953.70)	(17.39%)
2064/065	11992.606	(1760.30)	(14.68%)
2065/066	13103.181	(1894.90)	(14.46%)

Sources: - Annual Reports of NEA

The above table shows the net profit ratio of NEA. It is negative in every year. This indicates the bad position of NEA. NEA shall reduce its unnecessary expenses and power loss to increase its profit. Otherwise, it will also lose the existence. The table shows that, net profit ratio is increasing negatively year by year, which clearly denotes the dark future of NEA.

B. Return on Capital Employed Ratio

This ratio measures the relationship between capital employed and net profit after tax. It indicates how well the management has used the fund supplied by the creditors and the owners. Higher ratio indicates the efficient utilization of fund and makes it entrust able to the creditors and the owners. This ratio is calculated by using the following formula.

$$\text{Return on Capital Employed Ratio} = \frac{\text{Net profit after tax}}{\text{Capital Employed}} \times 100$$

Table 4.27

Computation of Return on Capital Employed Ratio of NEA

From FY 2061/062 to 2065/066

(Rs in Million)

Fiscal Year	Net Profit	Capital Employed	Ratios
2061/062	(51.00)	72428.70	(0.07%)
2062/063	(860.70)	68018.50	(1.27%)
2063/064	(1953.70)	66347.20	(2.94%)
2064/065	(1760.30)	66229.60	(2.66%)
2065/066	(1894.90)	62560.50	(3.02%)

Sources: - Annual Reports of NEA

The above table shows the return on capital employed ratio of NEA. During the period covered by the study, capital employed is found to be very fluctuating and decreasing every year. It means the capital employed is in risk. Return on capital employed ratios are negative in every years. NEA has not been able to increase it positively. In FY 2061/062 ratio was 0.07 percent and at last, it found to be 3.02 percent. I would like to suggest the management group of NEA to manage its capital effectively so as to increase its return ratio.

C. Return on Total Assets

The relation between net ratio and utilization of total assets of the company is known as return on assets. The main objective of this ratio is to determine how efficiency the fund supplied by the total asset have been used by the management. This ratio is calculated by using the following formula:-

$$\text{Return on Total Assets} = \frac{\text{Net profit after tax}}{\text{Total Assets}} \times 100$$

Table 4.28

Computation of Return on Total Assets

From FY 2061/062 to 2065/066

(Rs in Million)

Fiscal Year	Net Profit	Total Assets	Ratios
2061/062	(51.00)	67574.70	(0.075%)
2062/063	(860.70)	71251.00	(1.21%)
2063/064	(1953.70)	73907.90	(2.64%)
2064/065	(1760.30)	78179.40	(2.25%)
2065/066	(1894.90)	82853.50	(2.29%)

Sources: - Annual Reports of NEA

This table shows the return on total assets ratio of NEA. The amount of total assets is increasing every year but its return on total assets ratios are negatively that too is fluctuating too much. It reflects the low productivity of assets. I would like to suggest the management group of NEA to manage its available assets in the way of increasing its productivity.

4.12 Managerial Budgeting with Cost- Volume- Profit Analysis

4.12.1 Identification of Cost Behaviour

While accounting to the cost behaviour, cost can be broadly classified into two ways. First is fixed cost and second is variable cost. If any cost remains constant in total at any level of activity within the relevant range, it is called the fixed costs. On the other hand variable costs change in direct proportion and in

the same direction as the change in activity level. Variable expenses are activity based because they are incurred as a direct result of production. Those expenses that are neither fixed nor variable because they possess some characteristics of both fixed and variable are known as semi variable.

Classification of costs into fixed and variable play an important role in management budgeting. It helps to determine the volume of operations desired to maintain the profitability. NEA has no practice of classifying its cost clearly. The classification of costs in fixed and variable has been found as below:-

Table 4.29

Classification of Expenses into Fixed and Variable

For the FY 2065/066

(Rs in Million)

Expenses	Cost behaviour	Fixed cost	Variable
Staff cost	F. C.	1551.82	-
Interest	F.C.	3324.60	-
Provision for expenses	F.C.	304.55	-
Loss on foreign Exchange	F.C.	50	-
Operating & Maintenance	Variable	-	1345.21
Royalty	F.C.	850.90	-
Power Purchase	Variable	-	5616.53
Depreciation	F.C.	1838.80	-
Deferred Expenditure	F.C.	350	-
Insurance fund	F.C.	20	-
Prior Year Expenses	F.C.	50	-

Sources: - Annual Reports of NEA

The above table no 4.29 shows the cost classification of NEA. The costs are found to be classified in fixed and variable. This table also showed that there is no clear cut vision for classification of costs with the practice that has been adopted by NEA. The fixed cost expenses are seemed to be more than the

variable cost. The purpose of classifying cost is to analyze the cost volume profit of NEA.

4.12.2 Cost Volume Profit Analysis

The analytical study of relationship between of cost, volume and profit is known as cost volume profit analysis. It is a device used to determine the usefulness of the profit planning process of the firm. In fact, the entire field of profit planning has become associated with the CVP inter-relationship. However, it should be noted that the formal profit planning and control involves the use of budgets and other forecasts and CVP analysis simply provides an overview of the profit planning process and help to evaluate the propose and reason of such budgets and forecasts.

The CVP analysis of NEA is based on the following assumptions:

1. Cost volume analysis is based on the accounting date of fiscal year 2063\064.
2. The selling prices of electricity don't change as unit of sales change.
3. Variable cost per annum is assumed to be remained constant.
4. Inventory of electricity is assumed to be nil.
5. No-operating income and revaluation surplus are included in cost volume profit analysis.
6. Fixed cost included both operating and non-operating fixed costs.

For the CVP analysis of NEA, the data of FY 2065/066 are as follows:-

Sales volume= 1964.393 unite in million

Sales revenue= Rs.13103.181 million

Total variable cost=Rs. 6961.74 million

Total fixed cost= Rs.8340.74 million

Total other income= Rs.566.1 million

a. Variable cost volume Ratio (VC Ratio)

$$\text{VC Ratio} = \frac{\text{Total Variable Cost}}{\text{Total Sales Revenue}}$$

$$= \frac{6961.74}{13103.181}$$

$$= 53\%$$

It means a rupee of sale includes Rs. 0.53 variable cost.

b. Profit volume Ratio (P/V ratio)

P/V Ratio = 1- VC ratio

= 1- 0.53

= 0.47

= 47%

It means a rupee of sale includes Rs. 0.47 for the fixed cost that was associated in the production process and the portion of profit or loss.

c. Break Even Point (in Rs)

(Note other income is non operating income)

$$\text{BEP (in Rs)} = \frac{\text{Total Fixed Cost} - \text{Other Income}}{\text{P/V Ratio}}$$

$$= \frac{8340.67 - 566.10}{0.47}$$

$$= \text{Rs. } 16541.64 \text{ million}$$

It means that, NEA will be in breakeven point, when its sales volume reached to Rs.16541.64 Million. But the current practice shows that the total sales revenue is in the below point of BEP volume. That is why we can say that NEA is suffering loss in every fiscal year. The fixed cost is very high in comparison

to contribution margin which caused huge loss every year. And because of lack of awareness of personnel in this regard, NEA has not taken any measure to lower the fixed cost.

4.13 Flexible Budget of NEA

A flexible budget is a set of alternative budget for different expected level of activities. It shows the budgeted revenue, cost and profit for different level of business activities rather than being based on only one level of activity. Thus a flexible budget can be used to evaluate the efficiency of a department throughout the business even if the actual level of business activity differs from the management's estimates.

NEA cannot prepare a flexible budget for the purpose of computing planned expenses amount in each responsibility centre. On the basis of the cost and other data of FY 2065/066, a flexible budget of NEA has been presented below. To prepare the flexible budget, the following assumptions should be adopted:

1. Sales revenue has been remained unchanged and constant ratio as it was in FY 2065/066.
2. Variable cost per unit also will not be changed for the whole year i.e. variable cost ratio is 0.47 for the whole period.
3. Total fixed cost remains constant.

Table 4.30

Flexible Budget of NEA

(Rs in Million)

Particular	43%	50%	70%	90%	100%
Sales Revenue	17627.14	20496.68	28695.35	36894	40993.35
Less, Variable cost	8284.76	10863.24	15208.54	19553.8	21726.48
Contribution Margin	9342.38	9633.44	13486.81	16340.2	19266.87
Less, Fixed cost	8340.67	8340.67	8340.67	8340.67	8340.67
Profit	1001.71	1292.77	5146.14	7999.53	10926.2

Sources: - Annual Reports of NEA

Table no 4.30 shows the flexible budget of NEA at 43, 50, 70, 90, and 100 percent capacity utilization. NEA can meet sales revenue amounting to Rs 17627.14, 20496.68, 28693.35, 36894 and 40993.35 by utilizing the capacity of 43, 50, 70, 90, and 100 percent respectively. This table also indicates that the NEA has been operating at lower capacity utilization and thus has enabled to earn profit.

Note: - The total capacity utilization by Authority is calculated below:

Total installed capacity = 613.557 MW

Total production = 264.275 MW

$$\text{Capacity Utilization} = \frac{\text{Total Production}}{\text{Total Installed Capacity}}$$

$$= \frac{264.275}{613.557}$$

$$= 43\%$$

4.14 Variance Analysis

The term variance refers to the deviation in between actual and the budget due to various causes. Variance analysis is the process of calculating the deviation of actual from budget and of interpreting the result. Variance analysis helps to ascertain the magnitude of each of the variance and causes of variance so that corrective actions can be taken. In variance analysis, when actual results are better than the budgeted, favourable variance is assumed to be raised. When actual results are not better than budgeted one, unfavourable variance are assumed to be raised. For the purpose of the study, the following variances of NEA have been analyzed:

1) Sales variance
2) Production variance

1. Sales Variance of NEA

The deviation in-between actual from budgeted sales volume of NEA is called sales variance of NEA. Variance can be classified in to two types, viz. favourable and unfavourable. It is used as an indicator of measuring an efficiency of any business firm. The following table shows the sales variance of NEA for the fiscal year 2061/062 to 2065/066:

Table 4.31

Sales variance of NEA

From FY 2061/062 to 2065/066

(Unit in Million)

Fiscal Year	Budgeted sales	Actual sales	Variance	Remarks
2061/062	1556.556	1407.127	-149.429	unfavourable
2062/063	1685.487	1534.313	-151.174	unfavourable
2063/064	1804.900	1696.816	-111.084	unfavourable
2064/065	1906.622	1795.233	-111.389	unfavourable
2065/066	1988.850	1964.393	-34.457	unfavourable

Sources: - Annual Reports of NEA

Above table no 4.31 shows the sales variance in units of NEA. In all of the fiscal year, sales unit variance is found to be unfavourable. Responsible department should be held the accountability for the result and take corrective action promptly so as to minimize the adverse impact of such variances.

2. Production Variance of NEA

The production variance is calculated to compare the budgeted and the actual production units of NEA. If the result found to be favourable, it will show the efficiency of NEA in regards to production and vice versa. The following table shows the production variance of NEA for the fiscal year 2061/062 to 2065/066:

Table 4.32
Production variance of NEA
From FY 2061/062 to 2065/066

(Unit in Million)

Fiscal Year	Budgeted production	Actual production	Variance	Remarks
2061/062	1605.81	1868.42	262.61	Favourable
2062/063	2003.880	2066.45	62.57	Favourable
2063/064	2149.00	2261.13	112.13	Favourable
2064/065	2469.718	2380.89	-88.828	Unfavourable
2065/066	2565.806	2692.75	126.944	Favourable

Sources: - Annual Reports of NEA

The above table has shown the production variance of NEA. It is clear that NEA has favourable variance in all of the fiscal year except in 2064/2065. The responsibility and an accountability of the result go to the respective production directorate. The above shown results of NEA have enforced to make a comment over the forecasting capacity of the production manager. What we can suggest in this regard is that, NEA shall develop more realistic rather than more ambitious objective in relation to its production.

4.15 Major Findings of study

The major points that I found by the detailed study as well as analysis of the entire budgeting practice of NEA in relation to its profitability are presented below:-

1. Actual and budgeted sales are found to be significant but the difference between budgeted and actual production is found to be vague. In spite of the fact, there is perfect correlation between budgeted and actual sales and production respectively.
2. NEA has adopted the practice of preparing strategic as well as tactical managerial budgeting, but even the strategic plan cannot play a vital role for its development.
3. It is bearing a high fixed cost due to the technology that it is using till now, overstaffing and many more.
4. Actual sales are always less than actual production due to power loss which is a main problem of NEA, which affects its profit directly.
5. It has not classified its overhead systematically, which creates difficulties in analysing the expenses properly.
6. The information system of NEA was not effective. The lower level staffs normally do not get information promptly and clearly. Instead of the fact, there is no any plan to develop an effective information system till now.
7. NEA has no sufficient cash surplus to pay for expenditure; it was to borrow loan to meet minimum cash balance and we can say that it is the result of poor cash plan. And for that, it is paying a huge amount of interest in every year and the trend is of adding on it rather than of paying back.
8. Account receivable and average collection period are found to be increasing within the study period. It is also upgrading the condition of cash shortage.
9. NEA was unable to meet its BEP sales therefore it was in loss every year.

10. There is a large possibility of earning a huge volume profit if its capacity is used at optimum level as the figure shown with the help of flexible budget.
11. NEA has not maintained its periodic performance report systematically.
12. Because of all those facts mentioned above, it is suffering from continuous loss.

CHAPTER -V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Public enterprises play a vital in the development of an economy. The role of public enterprises differs from country to country basically due to political philosophy of existing government. Usually it comes into existence either by the way of deliberating policy of the government to bring certain activities. In Nepal, the purpose of establishing Public enterprises was to make control over economy and to generate revenue to the government by providing basic goods services that are neglected by the private sector, to the citizens. They are found to be success in their goals basically up to the government launched the policy of free economy.

Managerial budgeting is the important tool of business operation. It helps to achieve objectives and goals to the enterprise. Profit is the essential part of every business organization. What we said earlier was that without profit, any enterprises cannot run for long term as a living being cannot live even a second without blood.

Managerial budgeting can be broadly divided in to two group viz. functional and financial plan. Functional plan includes sales plan, production plan, material plan and overhead plan etc. Financial plan includes cash flow plan, capital expenditure plan, projected income statement and projected balance sheet.

Time dimension is one of the important considerations for managerial budgeting. There are mainly two types of managerial budgeting that are being prepared and are: Strategic plan for 5 or more than five years and the tactical plan for the period of one year. Both of them are considered to be equally important for effective implementation. On the other hand difference between

actual and budgeted figure shall be noted strictly to take corrective action immediately to get the desired profit in future.

Nepal Electricity Authority is a public utility enterprise, which provides relevant services to the Nepalese. Since a public utility concern bears public interest, managerial budgeting system deserves the top most attention.
Now a days, NEA has been facing different types of problem such as a huge amount of account receivable, less utilization of capacity and power loss etc. which force to reduce its efficiency day by day, normally reflects from the condition of loss.

The main objective of the present study is to examine the current practice, application and the result of managerial budgeting approach in Nepalese Public Enterprises by taking a case study of NEA.

The study has been organized in five main chapters consisting of introduction, Review of literature, Research methodology, Presentation and analysis of data, and Summary, conclusion and recommendation.

5.2 Conclusion

After analyzing in detail in relation to the present practice of managerial budgeting process and its impact in profitability in Nepalese Public Enterprises by taking a case study of NEA, I have made the conclusions stated as below:

1. NEA has the practice of preparing two types of managerial budgeting, which are tactical and strategic. Tactical plan prepared for external purpose but strategic plan is made only for top level management or internal purpose.
2. NEA is not achieving sales target. The sales achievement percentages of amount are 91.82, 92.13, 91.82, 93.50 and 98.70 percentage for the fiscal year 059/060, 060/061, 061/062, 062/063 &063/64 respectively.

3. The statistical tools show that there is perfect correlation between budgeted and actual sales as well as actual production with budgeted production and C.V. indicate that there have more variation in between actual and the budgeted sales and on the other hand budgeted production has more variation to the comparison of actual production.

4. Actual sales revenue is increasing in every fiscal year period and found of reaching up to Rs 13103.184 million in FY 2065/066. Likewise, actual production is also in the increasing trend and found of reaching up to 2642.75 million units in FY 2065/066.

5. NEA has vast gap between actual sales and actual production. It proves that it has not been success in selling its available production completely.

6. The actual overhead of NEA is in increasing trend due to higher amount of fixed cost, interest on long term loan and other those expenses rounding together with the name of distribution and administrative expenses. As well as it has not segregated its cost systematically that is suggested by Accounting Standard.

7. Operating costs have not been controlled effectively. In fiscal year 2060/061, it was Rs 1832.3 million and reached to Rs 2122.3 million in the fiscal year 2065/066.

8. NEA bears huge unit of power losses and is increasing year by year. In fiscal year 2065/066, it is found to be 678.357 million units, which is 25.67 percentage of total units produced.

9. NEA has been suffering from loss in every year. In the FY 2061/062 the loss was of Rs. 51 million and reached to Rs 1894.90 million in the FY 2065/066. And we can say the condition will last for further next year's too, if not taken a corrective action.

10. It is not considering CVP analysis as a tool for developing the sales plan and pricing strategy.
11. It is found the NEA is not utilizing its capacity fully and effectively due to the lack of adequate fund and the traditionalism.
12. Total debt turnover ratio of NEA is not found to be favourable.
13. The activity ratios are also found at below the standard for the period covered by the study.
14. The net profit ratio of NEA does not indicate the sound position of profit. It is suffering from loss in each year though the ratio was found to be decreasing in comparison to fiscal year 2063/064 to 2065/066.
15. The sales revenue variance of NEA is in an unfavourable condition. NEA has no any favourable variance during the study period.
16. NEA has no practice of preparing monthly budget, which is assumed to be the key of overall managerial budgeting.

5.3 Recommendations

Most of the above conclusion points are seemed to be unfavourable; those should be made correction as soon as possible. I strongly suggest the following to NEA and to all of the Nepalese Public Enterprises who are facing the above mentioned problems respectively, to change unfavourable points into favourable:

1. NEA shall develop an efficient management system to get control over cost. It must classify the costs into fixed cost and variable to maintain the Accounting Standard.
2. NEA shall restructure its capital and give emphasis over the internal financing so as to avoid burden of interest. On the other hand it should complete the proposed projects in time so that they will get return to repay loan in time.

3. To achieve the targeted growth rate in sales revenue, NEA should make realistic forecast. Sales forecasting should be made after analyzing all variable that affect the sales. NEA should consider demand determinants such as family income, price of electricity, connotation charges, cost of alternative power, cost of auto generation of electricity and reliability of NEA service.

4. NEA shall give emphasise over cost volume profit relationship while developing the sales plan and strategy. To maintain the level of BEP, it shall minimize its fixed cost and variable cost as well as increase the sales revenue.

5. NEA shall follow a strict credit collection policy to collect account receivable in time. Collection policy shall not be influenced by politics.

6. NEA shall utilization its optimum capacity by importing the latest technology around the world and by making a group of management standby for it.

7. Electricity loss is increasing each year, which is a main cause of reducing sales revenue. So, leakage of the electricity shall be controlled promptly. The most important aspect is to motivate its employees engaged in transmission and distributions line to control the leakage. Staffs who are themselves engaged in encouraging power leakage should be strictly demoralized.

8. NEA shall maintain a sound liquidity position by the help of increasing current assets and/or by decreasing current liabilities.

9. NEA should adopt standard costing system and also establish a cost control centre for cost control purpose.

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APPENDIX-2

Production Plan of NEA

Target & Achievement of Production

(Unit in Million)

FY	Budgeted Production (X)	Actual Production (Y)	U=X-$\overline{X}$	V=Y-$\overline{Y}$	U^2	V^2	UV
2061/62	1605.81	1868.42	(553.03)	(375.508)	305842.18	141006.258	207668.3
2062/63	2003.88	2066.45	(154.96)	(177.478)	24012.60	31498.44	27502.3
2063/64	2149	2261.13	(9.84)	17.202	96.83	295.909	-169.25
2064/65	2469.718	2380.89	310.88	136.962	96646.37	18758.589	42578.12
2065/66	2565.806	2642.75	406.96	398.822	16521.32	159058.987	162303.79
	$\sum X$ = 10794.214	$\sum Y$= 11219.64			$\sum U^2$= 592219.3	$\sum V^2$= 350618.183	$\sum UV$= 439883.26

(1) Calculation of Arithmetic Mean

$$\overline{X} = \frac{\sum X}{N} = \frac{10794.214}{5} = 2158.84 \text{ million units}$$

$$\overline{Y} = \frac{\sum Y}{N} = \frac{11219.64}{5} = 2243.928 \text{ million units}$$

(2) Calculation of Standard Deviation (σ)

$$\sigma_x = \sqrt{\frac{1}{n}\sum U^2} = \sqrt{\frac{1}{5} \times 592219.3} = 344.157 \text{ million units}$$

$$\sigma_y = \sqrt{\frac{1}{n}\sum V^2} = \sqrt{\frac{1}{5} \times 350618.183} = 264.809 \text{ million units}$$

(3) Calculation of correlation coefficient

$$r = \frac{\sum uv}{\sqrt{\sum u^2 \times \sum v^2}} = \frac{439883.26}{\sqrt{592219.3 \times 350618.183}} = 96.53\%$$

(4) Calculation of Probable errors

$$Pe = \frac{0.6745(1-r^2)}{\sqrt{n}} = \frac{0.6745(1-0.9653^2)}{\sqrt{5}} = 0.02\%$$

(5) Calculation of coefficient of variance

$$\text{CV of X} = \frac{\sigma_x}{\overline{X}} = \frac{344.157}{2158.84} = 15.94\%$$

$$\text{CV of Y} = \frac{\sigma_y}{\overline{Y}} = \frac{264.809}{2243.928} = 11.80\%$$

APPENDIX-1

Sales Plan of NEA

Target & Achievement of Sales

(Unit in Millions)

FY	Budgeted Sales (X)	Actual Sales (Y)	U=X- $\overline{X}$	V=Y- $\overline{Y}$	U^2	V^2	UV
2061/62	1556.556	1407.127	(231.927)	(272.449)	53790.133	74228.457	63188.279
2062/63	1685.487	1534.313	(102.996)	(145.263)	10608.176	21101.339	14961.508
2063/64	1804.900	1696.816	16.417	17.24	269.518	297.218	283.029
2064/65	1906.622	1795.233	118.139	115.657	13956.823	13376.542	13663.602
2065/66	1988.850	1964.393	200.367	284.817	40146.935	81120.723	57067.928
	∑X = 8942.415	∑Y= 8397.882			∑U^2= 118771.585	∑V^2= 190124.279	∑UV= 149164.346

(1) Calculation of Arithmetic Mean

$$\overline{X} = \frac{\sum X}{N} = \frac{8942.415}{5} = 1788.483 \text{ million units}$$

$$\overline{Y} = \frac{\sum Y}{N} = \frac{8397.882}{5} = 1679.576 \text{ million units}$$

(2) Calculation of Standard Deviation (σ)

$$\sigma_x = \sqrt{\frac{1}{n}\sum U^2} = \sqrt{\frac{1}{5} \times 118771.585} = 154.124 \text{ million units}$$

$$\sigma_y = \sqrt{\frac{1}{n}\sum V^2} = \sqrt{\frac{1}{5} \times 190124.279} = 195 \text{ million units}$$

(3) Calculation of correlation coefficient

$$r = \frac{\sum uv}{\sqrt{\sum u^2 \times \sum v^2}} = \frac{149164.346}{\sqrt{118771.585 \times 190124.279}} = 99.26\%$$

(4) Calculation of Probable errors

$$Pe = \frac{0.6745(1-r^2)}{\sqrt{n}} = \frac{0.6745(1-0.9926^2)}{\sqrt{5}} = 0.04\%$$

(5) Calculation of coefficient of variance

$$CV \text{ of } X = \frac{\sigma_x}{\bar{X}} = \frac{154.124}{1788.483} = 8.618\%$$

$$CV \text{ of } Y = \frac{\sigma_y}{\bar{Y}} = \frac{195}{1679.564} = 11.61\%$$

APPENDIX-3

Actual Sales and Actual Production

(Units in Millions)

FY	Actual Sales (X)	Actual Production (Y)	U=X- $\bar{X}$	V=Y- $\bar{Y}$	U^2	V^2	UV
2061/62	1407.127	1868.42	(272.449)	(375.508)	74228.457	141006.258	102302.273
2062/63	1534.313	2066.45	(145.263)	(177.478)	21101.339	31498.44	25778.857
2063/64	1696.816	2261.13	17.24	17.202	297.218	295.909	296.769
2064/65	1795.233	2380.89	115.657	136.962	13376.542	18758.589	15842.258
2065/66	1964.393	2642.75	284.817	398.822	81120.723	159058.987	11359.071
	∑Y= 8397.882	∑Y= 11219.64			$\sum V^2$= 190124.279	$\sum V^2$= 350618.183	∑UV= 155579.228

(1) Calculation of Arithmetic Mean

$$\bar{X} = \frac{\sum X}{N} = \frac{8397.882}{5} = 1679.576 \text{ million units}$$

$$\bar{Y} = \frac{\sum Y}{N} = \frac{11219.64}{5} = 2243.928 \text{ million units}$$

(2) Calculation of Standard Deviation (σ)

$$\sigma_x = \sqrt{\frac{1}{n}\sum U^2} = \sqrt{\frac{1}{5} \times 563580.515} = 195 \text{ million units}$$

$$\sigma_y = \sqrt{\frac{1}{n}\sum V^2} = \sqrt{\frac{1}{5} \times 350618.183} = 264.809 \text{ million units}$$

(3) Calculation of correlation coefficient

$$r = \frac{\sum uv}{\sqrt{\sum u^2 \times \sum v^2}} = \frac{155579.228}{\sqrt{109124.279 \times 350618.189}} = 60.258\%$$

(4) Calculation of Probable errors

$$\text{Pe} = \frac{0.6745(1-\text{r}^2)}{\sqrt{\text{n}}} = \frac{0.6745(1-0.6025^2)}{\sqrt{5}} = 19.212\%$$

(5) Calculation of coefficient of variance

$$\text{CV of X} = \frac{\sigma_x}{\overline{\text{X}}} = \frac{195}{1679.564} = 11.61\%$$

$$\text{CV of Y} = \frac{\sigma_y}{\overline{\text{Y}}} = \frac{264.809}{2243.928} = 11.80\%$$