

## CHAPTER I

### INTRODUCTION

#### 1.1 General Background

Nepal lies between two giants of Asia: India and China. Nepal is bounded on north by china and the east, south and west by India. Nepal is the country of hills and mountains, with an area of 47181 square meters. Geographically, Nepal lies in 26<sup>0</sup>22' to 30<sup>0</sup>27' north latitude and 80<sup>0</sup>4' to 88<sup>0</sup>12' east longitude. The steepest country in the world, descends from the heights of Everest to the tiger-prowling jungles below. The most beautiful country, discover the world of mountain, river, jungle and culture in the world of Nepal.

A part from its natural beauty and diversity Nepal has been known for developing country. Agriculture is the backbone of the Nepalese economy means of livelihood for the majority of population and the main source of gross domestic production, income and employment generation. Agriculture has been playing a key role in Nepalese economy where more than 80% of the economically active population is estimated to be involved in agriculture. But non agricultural sector has also significant contribution in the national economy. Economic growth of the country has not improved substantially over time to overtake population growth. As the current population growth is 2.24 percent per annum, the gain achieved by development activities has been over shadowed by growing population. Little over half of the population of working age reported usually economically active in 2001. Population census 2001 reports that 53.1 percent are unemployed. Contribution of non-agricultural activities are gradually increasing in the gross domestic product (GDP).

Nepal is poor in mineral resources but very rich in huge potential for hydroelectric power. It has 2.275% of the world water resources. Nepal has 44000 MW economically exploitable hydropower potential. Nepal's water resources are its foremost natural endowment. Due to abundance of huge water resources, Nepal can be self sufficient in power sector. For this NEA can contribute much more to the upliftment of the country if planned, organized, developed and motivated properly.

## **1.2 Public Enterprises**

### **1.2.1 Meaning**

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 is undesirable. They should have certain degree of freedom as well. (Baral, 2001:2).

The term 'public enterprise' has been defined differently by different agencies and government to suit their own respective situation, UN has defined PE as "those organization 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." (Shrestha, 1990: 3)

According to encyclopedia Britannica, Public enterprise, may be defined as an undertaking that is owned by a national state or local government supplies service or at a price and is operated on a more or less self supporting basis. Such enterprise may also be international instated or inter-municipal i.e. owned and operated jointly by two or more national state or local government. (Shrestha, 1990: 19)

Public enterprises play a very important role in most of developing countries. The role of public enterprises differs from country to country, basically due to political philosophy of existing governments. Public enterprises came into existence either by the way of deliberate policy of the government to bring certain activities under strict government control by creating new institution or by nationalizing them from private sector. 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)

### **1.2.2 Public Enterprises in Nepal**

Nepal has adopted mixed economic system where contribution of private and public sectors are co-existed in harmonious and collective way. Public enterprises in Nepal constitute a vital instrument for the Socio-economic development of our country. It enjoys a strategic and crucial position in our mixed economy. They have been established in many sectors for the overall development of the nation with different goals and objectives. Consequently, they are predominant in the production or supply of electricity, communication, sugar, cement, leather, cigarettes, agricultural tools, petroleum products and all the public utilities.

Establishment of new enterprises and their role in other developing countries encouraged His Majesty's Government of Nepal to adopt the path of development through the public enterprises. Nepal Bank Limited, a Commercial bank, was the first public enterprise to have a separate legal entity in Nepal. Which was established in 1994 B.S. Nepal Bank Limited was the first public enterprise established prior to the launching of the planned development policy in 2013 B.S.

Nepal started its planned economic development in 2013 B.S. with the launching of the first five-year plan. Since 2013 B.S., Nepal has witnessed grow and development of PEs. Since then, the number of public enterprises has increased substantially in the various fields of national economy. The first Five-year plan (2013-2018) adopted the principle of "Mixed economy:" and seven PEs, were established during the plan period. The second three-year plan (2019-2022) demarcated the areas of public enterprises as basic utilities and infrastructures like electricity, transportation, communication, etc. Eleven, PEs were established during this period including establishment of Nepal Electricity Corporation.

Most of the Nepalese PEs have been suffering from regular operating loss. Only 15 PEs have been operating in normal profit. Therefore, most of the PEs are obliged to depend on their budget to government. They are creating a huge amount of liabilities to the government as financial burden and considered the public revenue is misusing. Therefore the government has adopted a privatization policy in eighth Five year plan and dissolve some PEs which are operating at loss. There are 24 PEs privatized till date. Now, there are 38 PEs existed. Among 38 existing PEs, There are three public utilities namely Nepal Electricity Authority, Nepal Telecom, & Nepal Drinking Water Corporation.

### **1.3 An Overview of Nepal Electricity Authority**

The key player in Nepal's power sector is the Nepal Electricity Authority (NEA). NEA is the largest government enterprise in Nepal with the country's highest capital investment, assets and human resources. Nepal electricity Authority is also the largest government enterprise from the point of view of royalty payment to government.

Nepal Electricity Corporation was established on Bhadra, 2019 B.S., under Electricity Corporation Act 2019 B.S. to generate and distribute electricity in secured, efficiently and orderly manner in Bagmati Zone and Bhimphedi town in Makwanpur district. Before that, Bijuly Adda used to distribute the electricity in Kathmandu valley and held monopoly in electricity management till 2019 B.S. NEC was the modified form of Bijuli Adda regarding operational areas. Electricity department was also created and which was responsible for surveying, constructing new power plants and transmission lines. Some development committees were also constituted to develop hydropower plants, transmission lines and small hydropower plants. In the eastern development region, another corporation of similar purpose was emerged i.e. Eastern Electricity Corporation to bring out uniformity, efficiency and regularity in the service of electricity distribution.

To remedy the inherent weakness associated with these fragmented electricity organizations with overlapping and duplication of works, merger of these individual organization became necessary to achieve efficiency and reliable service. Nepal Electricity Authority (NEA) was created on Bhadra 1, 2042 (August 16, 1985) under the Nepal electricity Authority Act, 2041, through the merger of the department of

electricity of Ministry of water resources, Nepal Electricity Corporation and related Development Boards.

The primary objective of NEA is to generate, transmit and distribute adequate, reliable and affordable power by planning, Constructing, Operating and maintaining all generation, transmission and distribution Facilities in Nepal's power system both interconnected and isolated. In addition to achieving these primary objective, NEA's has certain major responsibilities. They are:

- To recommend to His Majesty's Government, long and short-term plans and policies in the power sector,
- To recommend, determine and realize tariff structure for electricity consumption with prior approval of HMG,
- To arrange for training and study so as to produce skilled manpower in generation, transmission, distribution and other sectors.

Management of NEA is entrusted to a board of Directors, the chairman of the Board being the Minister of Water Resources, two HMG secretaries and four other members from the public. The managing director of NEA is the member secretary of the board. Authority to undertake the daily administration of NEA is delegated to the Managing Director of NEA, who is also the member secretary of the Board.

([www.nea.org.np](http://www.nea.org.np).)

The total energy sale during the fiscal year 2065/66 was 2308.91 GWH. This is an decrease of 1.41 GWH over the previous fiscal year's figure. The total electricity sales comprised of 2260.32 GWH as internal sales

and 48.59 GWH as energy export to India, the number of customers served by NEA reached 16,70,610 during the fiscal year 2065/66, which is an increase of about 10.13 percent as compared to the previous year's consumers figures. This comprised of 15,95,015 consumers in domestic sector, 28559 in industrial sector, 7305 in commercial sector and rests in other categories of consumers. NEA's total revenue increased over the previous year's figure by 1.48 percent to Rs. 236.5 Million. The total approved positions of Human Resources as of end of fiscal year 2065/66, is 10,314, out of which 9280 positions are filled. (A Year in Review-FY 2065/66)

#### **1.4 Statement of Problem**

Nepal Electricity is the key institution in the country's power sector. It is enjoying pure monopoly in the market. It's product has become a basic needs of all. Therefore, it has no difficulty in selling it's product since, there has always been more demand than available supply. But in practice NEA has serious weaknesses in planning of revenue. It has suffering losses year after year.

Although it is a key player in power sector and has lots of heavy resources, it is facing so many problems. The total system losses of NEA is very high. Generally, acceptable standard system losses of electricity company is 15%, while NEA experiencing 25.27% system losses. The total number of consumers served by NEA at the end of fiscal year 2065/66 was 16,70,610 an increase of 10.13 percent over the previous year. In spite of immense demand for electricity from the increasing population and growing economy, it is facing many operational management problems. Government and foreign donor agencies has invested huge amount in NEA to provide quality services to common

people and generate substantial amount of dividend as well as tax. Although, investing a large amount, the return is not satisfactory, it shows the managerial inefficiency and poor performance. Therefore, the problem associated with its should be identified and corrected.

Key motive of business enterprises is to make and maximize profit. A profit does not happen by chance. It is to be planned & managed. Cost-volume-Profit analysis is a supplementary tool of planning for profit. CVP analysis provides the techniques to aid management functions. NEA is not performing well as is evident from their annual reports. Poor performance is the outcomes of poor planning, controlling & decision making. This has raised the question whether Nepalese managers are competent enough? Do they practice cost- volume-profit analysis tools & techniques to carryout planning?

The research questions posed in this research were.

1. What are the reasons of financial loss?
2. What are the relationships between cost volume and profit?
3. What are the major difficulties in the application of CVP analysis?
4. Which tools of CVP analysis (i.e. CM, BEP, MOS etc.) are mostly practiced and which aren't practiced till now?
5. Can CVP analysis assist the cost planning?

### **1.5 Objectives of the Study**

The main objective of this research is to examine & study cost-volume-profit analysis of NEA to determine the relationship between cost, volume, and profit and financial position of the NEA, The specific objectives were:



1. To study and examine the relationship between cost, volume and profit as a tool of management.
2. To evaluate the profitability, financial position and sensitivity of Nepal electricity authority's activities.
3. To analyze the cost- volume- profit of the company and it's impact in profit planning.
4. To make necessary suggestions and recommendations to the company on the basis of study.

### **1.6 Significance of the Study**

The present research work is the study of the cost-volume-profit analysis of Nepal Electricity Authority. This study will be significant in the following ways:

1. It examines the application of cost-volume profit analysis in Nepal Electricity Authority.
2. It provides necessary theoretical conception and information on the application of the tools in profit planning under different circumstances. Thus, it will encourage the company to use CVP tools in decision making.
3. It will be useful to the potential investors, lenders, managers, policy makes & others interested parties.
4. Lastly, it provides literature to the researcher who wants to carry on further research in this field.

## **1.7 Limitations of the Study**

The present research has the following limitations.

1. The study covers the CVP analysis of last five years only. (i.e. FY 2061/62 to 2065/66)
2. The study is mainly based on secondary data as well as primary data i.e. Annual report & journal collected from the company and inclusive of discussion.
3. The accuracy and reliability of this study is based on true response and the data available from management of the company.
4. The study is focused on Nepal Electricity Authority. Thus the findings might not be applicable to other companies.

## **1.8 Organization of the Study**

This thesis has been divided into five chapters. They are:

1. Introduction
2. Review of Literature
3. Research Methodology
4. Data presentation and analysis
5. Summary, Conclusions and Recommendations

The introduction chapter covers General Background, Meaning of public enterprises, overview of the company, statement of the problem, research objectives, significance of the study and limitations of the study.

The second chapter focuses on review of literature. It contains the conceptual framework and past research literature on the same organization or under profit planning and control area are included.

The third chapter deals with the research methodology to be adopted for the study comprising research design, sources of data, data collection techniques and method of analysis, research variables and data processing procedure.

The fourth chapter deals with presentation, analysis and interpretation of data, for this purpose various analytical and statistical tools have been used to analyze and interpret the results. Also the major findings of the study are included here.

The last chapter covers summary, conclusions and recommendations. Besides these, bibliography, appendix and other related items are also been incorporated at the end of the study.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

#### **2.1 Conceptual Framework**

Conceptual framework is the foundation on which the entire thesis is based. It is a logically developed, described and elaborated network of associations among variables that have been identified through different processes as observations, interviews and literature survey etc. The variables are relevant to the problem situation. Some philosophers, writers or researchers have given the contribution on it since many years.

##### **2.1.1 General Concept of Profit**

Profit is the primary objective of a business. The word profit implies a comparison of the operation of business between two specific dates, which is usually separated by an interval of one year. No company can survive long without profit. Profit is the ultimate measure of its effectiveness, and in a capitalist society, there is no future of private enterprise which always incurs losses. Profit is a signal for the allocation of resources and yardsticks for judging managerial efficiency. (Kulkarni, 1992: 100)

The basic objectives of running any business organization is to earn profit. Profit serve as a yardstick for judging the competence and efficiency of the management. (Maheshwari, 2000:C. 171)

Several economists have different views in respect of the term profit. According to F.B. Hawley, "Profit is the reward for risk taking in business." Schumpeter opens that an entrepreneur earns profit as reward for his introducing innovation. J.M. Keynes held the view that profit

resulted from favourable movements of general price levels. Mrs. Joan Robinson and Chamberlin opened that the greater the degree of monopoly power, greater will be the profit made by the entrepreneur. It should be noted that profits are residual income left after the payment of contractual to other means of production. (Joshi, 2002: 276)

Thus, economic theories of profit have been categorized into three broad groups. The first looks on profit as the reward for bearing risk and uncertainty. The second views profit as the consequence of friction and imperfection in the competitive adjustment of the economy to dynamic changes, the third sees profit as the reward for successful innovation.

### **2.1.2 General Concept of Planning**

Planning is first function of management. It is performed continuously because the passage of time demands both replanning and making new plans. Moreover, current feedback often necessitates newly planned action to (a) correct performance deficiencies, (b) Cope with unanticipated events that are unfavourable and (c) take advantage of new developments. Management planning is a process that includes (1) establishing enterprises objectives and goals (2) developing premises about the environment of the entity (3) making decisions to activate the plans and (4) evaluating performance feedback for replanning. Management planning provides the basis of performing the four other functions organizing, staffing, leading and controlling, (Welsch, Hilton, and Gordon, 2000: 4-5)

It is some times said that planning is the primary managerial function, which logically proceeds all other functions. Without planning, a manager would not have activities to organize, would have no need to control. However, the managerial job is actually one which takes place

simultaneously rather than serially. Planning is one of the functions of the manager and, as such involves the election from among alternatives of enterprises objectives, policies, procedures and programs. It is thus decision making affecting the future course of an enterprise (Koontz and Donnel, 1990:21)

During the planning process, managers attempt to agree on company goals and objectives and strategies to achieve them. Planning is the process of developing enterprise objectives and selecting future courses of action to accomplish them. It includes:

- ) Establishing enterprise objectives.
- ) Developing an analysis of the environment in which they are to be accomplished.
- ) Selecting a course of action to accomplish the objectives.
- ) Initiating activities necessary to translate plans into action.
- ) Re-planning to correct current deficiencies.

(Bajracharya, Ojha, Goet and Sharma, 2004:343)

### **2.1.3 Concept of Profit Planning**

Profit planning is, therefore a fundamental part of the overall management functions and is a vital part of the total budgeting process. The management determines the profit goals and prepares budgets that will lead them to the realization of these goals. Profit planning can be done only when the management has the information about the cost of the products both fixed and variables, and the selling price at which it will be

in a position to sell the products of the company. (Maheshwari, 2000: C. 171)

The business budget has three fundamental purposes: (1) planning future operations, (2) co-ordinating all the companies activities and (3) controlling comprehensive profit planning and control (also called budgeting) is reviewed as a process design to help management effectively. The PPC model involves: (1) development and application of broad and long-range objectives of the enterprises, (2) specification of enterprises goal, (3) development of strategic long-range profit plan in broad terms, (4) specification of tactical short-range profit plan detailed by assigned responsibilities (division, department, profits) (5) establishment of a system of periodic performance, reports detailed by assigned responsibilities, and (6) development of follow up procedures. (Welsch-Hilton and Gorden, 2000:30-31)

Profit planning is a detailed plan of action during a period of one year or less. Profit planning helps a firm's financial manager to regular flow of funds, which is primary concern. (Pandey, 1999: 233)

Profit planning is the heart of management, without proper planning of profit it will not just happen. So every enterprise should systematically plan for profits in proper way. Various functional budgets are the basic tools for proper planning of profit and control over them. Profit planning in fact is a managerial technique. It is such a written plan in which all aspects of business operations with respect to a definite future period are included. It is a formal statement of policy, plan, objectives and goals established by the top management in respect of some future period. It is a predetermined detailed plan of action developed and distributed as an audit to currents operations and as a partial basis for the subsequent

evaluation of performance. Thus we can say that profit planning is a total, which may be used by the management in planning the future course of action and in controlling the actual performance. (Gupta, 1992: 521)

#### **2.1.4 Comprehensive Profit Planning and Control**

The concept of a comprehensive budget covers its use in planning, organizing and controlling all the financial and operating activities of the firm in the forth-coming period.

Comprehensive profit planning and control has been used extensively in the literature of business. Other terms sometimes used in the same context are comprehensive budgeting, managerial budgeting and budgeting. The term comprehensive profit planning and control may be broadly define as a systematic and formalized approach for accomplishing the planning and control responsibilities of management. Specifically, it involves the developing and application of:

- a. Broad and long range objective for the enterprises.
- b. Specification of enterprise goals
- c. Long-range profit plan developed in broad terms.
- d. Short-range profit plan detailed by relevant responsibilities.
- e. A system of periodic performance reports detailed by assigned responsibilities.
- f. Follow up procedures.

(Welsch, Hilton and Gordon, 2000: 33)

Comprehensive profit planning and control is a new term in the literature of business. Though it is a new term, it is not a new concept in 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 process/techniques of management that enhance the efficiency of management.

### **2.1.5 Major Tools Use in Profit Planning and Control**

Profit planning and Control represents on overhaul plan of operations which covers a definite period and formulates of planning decision of management. It consists of three main budgets, which are:

#### **1. Operating Budget**

The operating budget covers revenue and expenses. In other words, operating budget relates to the physical activities or operations of a firm such as sales, production, purchased, labour and other different expenses budgets. In specific term an operating budget has the following term:

**i. Sales Budget:** A sales budget is a detailed schedule of expected sales for coming period which is usually expressed in both amounts and units. Once the sales budget has been set, a decision can be made on the level of production that- will be needed to support sales and the production budget can be set well. The sales budget is constructed by multiplying the expected sales in units by the sales price. (Garrison, 1985:306)

Sales budget is prepared from sales forecast where as a sales forecast encompass potential sales for the entire industry as well as potential sales for the firm preparing the forecast. Sales results from prior years are used as a starting point in preparing a sales forecast. (Welsch, Hilton and Gordon, 2000:173)

**ii. Production Budget:** After the sales budget has been prepared, the production requirements for the forth coming budget period can be determined and organized in the form of a production budget sufficient goods will have to be available to meet sales need and provides for the desired ending inventory. A portion of these goods will already exist in the form of beginning inventory. The remainder will have to be produced. Thus, production need can be determined by adding budgeted sales units to the desired ending inventory and deducting the beginning inventory from the total. (Horngreen, Foster and Datar, 1999:182)

**iii. Purchase Budget:** In case of Merchandising firm, instead of preparing production budget, it would prepare a merchandise purchase budget showing the amount of goods to be purchased from its suppliers during the period. The merchandise purchase budget is in the same basic format as the production budget, except that, it shows goods to be purchased rather than goods to be produced.

**iv. Direct Materials Budget:** After the production needs have been computed, a direct material budget should be prepared to show the materials that will be required in the production process. Sufficient raw materials will have to be available to meet production needs and to provide for the desired ending raw material inventory for the budget period part of this raw materials requirement will already exist in the form of a beginning raw material inventory. The remainder will have to be purchased from supplier.

**v. Direct Labour Budget:** The direct labour budget is also developed from the production budget. Direct labour requirements must be computed so that the company will know whether sufficient labour

time is available to meet production needs. Just knowing in advance, the company can develop plan to adjust the labour force as the situation may require. Direct labour requirement can be computed multiplying product to be produced by each period by the number of direct labour-hours required to produce a single unit. Many different types of labour may be involved. If so, then computation should be by type of labour needed. The hours of direct labour time resulting from these computations can then be multiplied by the direct labour cost per hour to obtain budgeted total direct labour cost.

**vi. Manufacturing Overhead Budget:** The manufacturing overhead budget provide a schedule of all costs of production other than direct material and direct labour. These cost should be broken down by cost behaviour for budgeting purposes and a predetermined overhead rate developed. This rate will be used to apply manufacturing overhead to units of product throughout the budget period.

**vii. Selling and Administrative Overhead Budget:-** The selling and administrative expenses overhead budget contains a listing of anticipated expenses for the budget period that will be incurred in areas other than manufacturing-the budget will be made up of many. Smaller, individual budgets submitted by various persons having responsibility for cost control in selling and administrative matters. If the number of expenses item is very large, separate budgets may be needed for the selling and administrative functions.

**2. Financial Budgets:** Financial budgets are concerned with expected cash receipts/ disbursement financial position and result of operations. The components of financial budget are:

**i. Budgeted Income Statement:** The budgeted income statement is one of the key schedules in the budget process. It is the document

that tells how profitable operations are anticipated to be in the forthcoming period. After it has been prepared, it stands a benchmark against which subsequent company performance can be measured. (Garrison, 1985: 313)

**ii. Cash Budget:** Cash budget is the detail showing cash receipt, cash disbursement and the balance cash. The cash budget is composed of four major sections: The receipts section, the disbursements section, the cash excess or deficiency section, and the financing section. The receipts sections consists of the opening balance of cash added to whatever is expected in the way of cash receipts during the budget period. The disbursement section consists of cash payment that are planned for the budget period. The cash excess of deficiency section consists of the difference between the cash receipts section total and the cash disbursement section total. The financing section provides a detailed account of the borrowing and repayments projected to take place during the budget period. It is also includes a detail interest payment that will due to money borrowed.

**iii. Budgeted Balance Sheet:** Budgeted balance sheet is a statement of assets and liabilities prepared after the preparation of operating budgets and financial budgets. It is based on functional or operating budgets, cash budget, projected income statement and the previous year's assets and liabilities. In other words, budgeted balance sheet develop by beginning with the current balance sheet and adjusting it for the data contained in the other budgets.

### **3. Appropriation Budget**

The appropriation budget covers all types of expenditure on advertising and research sectors.

A part from above budgets, PPC also has relationship with following additional budgets, CVP analysis, completion of profit plan and performance reports:

- **Flexible Budgets:** Flexible expenses budget relates only to expenses or costs. They are also called dynamic, activity or output adjusted expenses budgets. The concept of flexible expenses budget is that all expenses are incurred because of passage of time, output, activity or combination of time and output or activity. Therefore, it is complementary to tactical profit plan which helps to provide an expenses plan. They should be adjusted to actual output for comparison with actual expenses in periodic performance report. Expenses or costs must be identified into fixed and variable expenses or costs in flexible budget.
- **Capital Expenditure Budget:** Capital expenditure budgeting is a process of planning and controlling of the long-term and short-term expenditure for expansions, replacement, and contraction of fixed assets. Capital budgeting is useful to earn future profit and reduce future costs. The major elements of a capital expenditure budget are cash out-flow and cash in-flows. Cash outflow includes the cost of the project as cash out lays at different times during the life of a project. The cash out-flows are affected by the provision of residual value of old equipment, tax position, additional working capital needed etc. Cash inflows are expected cash revenue during the life of a project. The non-cash expenses like depreciation and tax position can affect the cash inflows.
- **Zero Based Budgeting:** Zero based budgeting is the method of budgeting in which managers are required to start at zero

budget levels every year and to justify all cost as if the programmes involved were being initiated for the first time. No costs are viewed as being on going in nature; the manager must start at the ground level each year and present justification for all costs in the proposed budget regard less of the type of cost involved. Zero based budgeting differs from traditional budgeting in which budgets are generally initiated on an incremental basis, the managers start with last year's budget and simply adds to it according to anticipated needs. The manger does not have to start at the ground each year and justify on going costs for existing programmes.

- **Activity Based Budgeting:** Activity based costing can lead to improved decision making which principles extend budgeting. Activity based budgeting focuses on the lost of activities to produce and sell products and services. It separates' indirect costs into separate homogeneous activity cost pools. Management uses the cause and effect criterion to identify to-cost-drivers for each of these indirect cost pools.
- **Cost-Volume-Profit Analysis:** The analysis of relationship between cost, volume and profit is known as cost-volume-profit analysis. It is an analytical tools for studying the relationship between volume, cost, price and profit. Cost-volume-profit analysis is great helpful in managerial decision-making. Specially, cost control and profit planning is possible with the help of cost-volume-profit analysis.
- **Completion of Profit Plan:** The principal output of a budgeting is a comprehensive profit plan that ties together all phases of an

organization's operations. The completion of profit plan is comprised of many separate budgets, or schedules, that are interdependent. In other words, completion of profit plan means the process of profit planning ends with the planned income statement and planned balance sheet.

- **Performance Reports:** Performance report is an important part of a comprehensive PPC system. The performance reporting phase of a comprehensive PPC programme significantly influences the extent to which the organization's planned goals and objectives are attained. Performance reports deal with control aspect of PPC or management control function of management defined as "the action necessary to assure the objectives, plans, policies and standards are being attend" or in other word, the objectives of control is to guarantee the achievement of the planned objectives of the management by introducing periodic systematic correction measure. Performance report is on of the vital tools of management to exercise its control function effectively.

## **2.1.6 Simple Structure of Profit Planning and Control**

### **Structure of PPC**



### **2.1.7 Cost-Volume-Profit Analysis as a Tools of Profit Planning and Budgeting**

Cost-Volume-Profit analysis is an important tools of profit planning because it provides the information about the behaviour of cost in relation to volume, volume of production or sales where the business will break-even, sensitivity of profit due to variation of output, amount of profit for a projected sales volume and quantity of production and sales for a target profit level etc. CVP analysis may therefore by defined as a managerial tools showing the relationship between various ingredients of profit planning, (i.e. cost, selling price and volume of activity). CVP analysis is an important media through which the management can have an insight into effects on profit on account of variations in cost and sales and take appropriate decisions. Cost-volume-profit analysis is great helpful in managerial decision-marking. Specially, cost control and profit planning is possible with the help of cost volume profit analysis. Profit planning is the fundamental part of the overall management functions. Profit planning can be done only when the management has the information about the cost of the product and selling price of the product.

### **2.1.8 Concept of Cost-Volume-Profit Analysis**

The dictionary meaning of 'cost' is the price paid to acquire, produce, accomplish or maintain any things, 'volume' is a mass or quantity of something or amount, 'profit' is the ratio of such pecuniary gain to the amount of capital invested and analysis is resolution, separation or breaking into parts. But actually cost-volume-profit analysis is the process of examining the relationship among revenues, costs and profits for a relevant range of activity and for a particular time frame. Basically,

CVP analysis involves finding the most favourable combination of variable costs, fixed cost, selling price, sales volume and mix of products sold. CVP analysis provides the managers with a powerful tools for identifying those course of action that will and will not improve profitability.

CVP analysis is a management accounting tools to show the relationship between the ingredients of profit planning. Profit planning is the function of the selling price of product and units sold. The entire gamut of profit planning is associated with CVP inter-relationships. CVP analysis is the technique explores the relationship which exist between costs, revenue, output level and resulting profit. Cost-volume-profit analysis can be extended to cover the effects on profits of changes in selling prices or service fees, cost, income tax rate and product mix. The aim of cost volume profit analysis is to have a fair estimate of total cost, total revenue and profit at various sales volume. CVP analysis provides the management with a comprehensive overview of the effects on revenue and costs of all kinds of short-run financial changes. It is related to profit, sales volume and cost.

Generally cost-volume-profit analysis provides information regarding (Munankarmi, 2003:124):

- Minimum level of sales to avoid losses.
- Sales level to earn target profit.
- Effects of changes in prices, costs and volume on profits.
- Effect of changes in sales mix on profit.
- New break-even point for changes.

- Impact of expansion plan on CVP relationship.
- Products that are most profitable and least profitable.
- Whether to continue or discontinue the sales of product or operation of plant.
- Whether to close or not the firm for a short-term.
- Effect on operating profit with the increase in fixed cost, etc.

### **2.1.9 Use of CVP Analysis in Profit Planning**

Planning, controlling and decision making are the essential managerial functions. Cost-volume-profit analysis helps the managers to plan for profit, to control cost and make decision. As such it helps (Munankarmi, 2003:123-124)

- To determine the break-even point in terms of unit or sales value.
- To ascertain the margin of safety.
- To estimate profits or losses at various level of output.
- To help management to find the most profitable combination of costs and volume (units).
- To determine the optimum selling price.
- To determine the sales volume at which the profit goal of the firm will be achieved.
- To determine the maximum sales volume to avoid losses.
- To determine most profitable and least profitable product.

- To determine new break-even point for changes in fixed or variable cost.
- To assess the likely effect of management decisions such as an increase or a decrease in selling price adoption of new method of production to reduce direct labour and increase output.

### **2.1.10 Application of Cost-Volume-Profit Analysis**

Cost-volume-profit analysis is applied specially for break-even analysis and profit planning. Business organizations are run to earn profit. Profit planning is the fundamental part of the overall management function. Profit planning can be done only when the management has the information about the cost of the product, both fixed and variable cost and the selling price of the product. The cost-volume-profit relationship will be established by break-even analysis. Therefore, cost-volume-profit analysis is used for (Maheshwari, 2000: C.174):

- i. Contribution Margin Analysis
- ii. Break-even Analysis
- iii. Profit-volume Analysis

#### **2.1.10.1 Contribution Margin Analysis**

The difference between selling price and variable cost (i.e. the marginal cost) is known as 'contribution margin' or "Gross margin". In other words, fixed cost plus the amount of profit is equivalent to contribution margin. It can be expressed by the following formula:

$$\begin{aligned} \text{Contribution Margin} &= \text{Selling Price} - \text{Variable Cost} \\ &= \text{Fixed Cost} + \text{Profit} \end{aligned}$$

We can derive from it that profit can not result unless contribution exceeds fixed cost. In other words, the point of no profit no loss shall be arrived at where contribution is equal to fixed costs. (Maheshwari, 2000: C.176)

CVP analysis is the amount of contribution margin available from the sales volume of absorb fixed cost and also contribute towards company's profit goal after deducting all variable cost of sales. When the contribution margin is high, then also profit be high. Contribution margin usually is expressed as a percentage of sales or contribution margin ration. i.e.,

$$\begin{aligned}\text{Contribution of Ratio} &= \frac{\text{Contribution Margin}}{\text{Sales}} \\ &= 1 - \frac{\text{Variable Cost}}{\text{Selling price}}\end{aligned}$$

The variables usually uses in cost-volume-profit analysis are:

**a Sales Value:** Any firm or company may have different products, services etc. The sales value is actually includes the quantity of total sales multiply by selling price per unit or sales rupees. Sales rupees is calculated by sales units multiply selling price per unit.

**b. Variable Cost:** Variable cost is that cost which is directly affected by change in the activity level. The per unit variable cost always constant. If the activity level is decrease, the variable cost also decrease. If the activity level or production level increase, then the variable cost also increase. Change of variable cost effects to P/V ratio, BEP and Net income. When variable cost increase: Net income, P/V ratio and margin of safety will be decrease but it helps to increase BEP.

**c. Fixed Cost:** Fixed cost remain constant in total amount despite the changes in the level of activities. That is, me fixed cost remain

unchanged in total as the activity level varies. When other factors remain unchanged, the change in fixed cost affects BEP and Net income. When increase the fixed cost: increase the volume of BEP and decrease the Net income or vice-versa. Fixed cost also called capacity cost.

**d. Mixed Cost:** Expenditures that cannot be categorized as purely fixed or variable is termed as mixed cost or semi-variable cost. Mixed cost contain both variable and fixed cost elements. Repair and maintenance, supervision, telephone cost, electricity charge are some example of mixed costs. It should be separated from the variable and fixed cost elements as the function of profit planning, cost control and decision making.

**e. Jumping Cost:** Some costs remain fixed over a wide range of activity, but jump to a different amount for activity levels outside that range. Such costs are called jumping costs or step fixed cost or moving fixed cost or ladder fixed costs.

#### **2.1.10.2 Break-even Analysis**

Break-even analysis is widely used technique to study cost-volume-profit relationship. The narrower interpretation of the term break-even analysis refers to a system of determination of that level of activity where total cost equals total selling price. The broader interpretation refers to that system of analysis which determines probable profit at any level of activity. It portrays the relationship between cost of production, volume of production and the sales value. CVP analysis includes the entire gamut of profit planning, while breakeven analysis is one of the techniques used in this process. However is so popular for studying CVP analysis that the two terms are used as synonymous terms (Maheshwari, 2000:C.175-C.181):

**I. Break-even Point:** The 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, is regarded as break-even point. At this point, the income of the business exactly equals its expenditure. Break-even point can be determined by the two methods (Maheshwari, 2000-.C.175-C.181):

**a. The Equation Method:** Break-even point can be calculated by using following algebraic equations:

$$\text{BE sales value} = \text{FC} + \text{VC} \pm \text{Profit}$$

$$\text{or, (BE sales unit} \times \text{SPPU)} = \text{FC} + (\text{BE Sales units} \times \text{VCPU}) \pm 0$$

**b. The unit Contribution Method:** BEP can also be ascertained through unit contribution margin approach. In this approach, BEP can be calculated by using following formula:

$$\text{BEP in units} = \frac{\text{Fixed Cost}}{\text{CMPU}} \times \frac{\text{Fixed Cost}}{\text{SPPU} - \text{VCPU}}$$

$$\text{BEP in amount} = \frac{\text{Fixed Cost}}{\text{P/V ratio}} = \frac{\text{FC}}{\text{CMPU}} \times \text{SPPU} \text{ etc}$$

At break-even point, the desired profit is zero. In case the volume of output or sales is to be computed for 'a desired profit', the amount of 'desired profit' should be added to fixed cost in the formula given above.

- **Cash Break-even Point:** It is the point where cash breaks even (i.e. the value of sales where cash realizations on account of sales will be just sufficient to meet immediate cash liabilities). While the calculating this point cash fixed cost (i.e. excluding depreciation and deferred expenses) and cash contribution (i.e. selling price less the

cash variable costs.) are considered. The point helps the management in determining the level of activity below which there are chances of insolvency on account of the firm's inability to meet cash obligations unless alternative arrangement are made. (Maheshwari, 2000:C.178):

$$\text{Cash BEP} = \frac{\text{Cash Fixed Cost}}{\text{Cash Contribution Per Unit}} \text{ in units.}$$

- **Composite Break-even Point:** In case a concern is dealing in several products, a composite break-even point can be computed according to the following formula (Maheshwari, 2000:C.179)

$$\text{Composite BEP in Amount} = \frac{\text{Total FE}}{\text{Composite P/V Ratio}} \times \frac{\text{TFC}}{\text{TCM}} \mid \text{TS}$$

- **Cost Break-even Point:** It refers to a situation where the costs of operating two alternative plant is equal. The point enables the firm to identify which plant is the best to operate at or a given level of output assuming that sales price per unit is the same (Maheshwari, 2000-.C.179-C.180)

**II. Break-even Chart:** The relationship between costs, sales and profit can be shown in the form of a chart. Such a chart not only depicts the level of activity where there will be neither loss nor profit but also shows the profit or loss at various level of activity (Maheshwari, 2000:C.181):



In the above Break-even Chart, an equilibrium point between sales or revenue curve and total cost curve is "Q" known as BEP. Therefore 'OS' is the break-even sales volume and 'OR' is the break-even sales in amount. If the actual sales volume is more than break-even sales, the organization will earn profit and if the actual sales is less than the break-even sales, the organization will suffer from loss.

#### **2.1.10.2.1 Applications of Break-even Analysis**

Break-even concept can be used to formulate different policies in a business enterprise. Some of these applications are (Maheshwari, 2000:C.182):

- 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.
- Effect of fixed cost or variable cost changes on sales volume.
- Selection of most profitable alternative and make or buy decisions and drop and/or add decisions.

#### **2.1.10.2.2 Assumptions of Break-even Analysis**

Contribution analysis and Break-even analysis are based on a specific set of assumptions that should be clearly understood. These underlying assumptions are (Maheshwari, 2000:C.182-C.183):

- All cost can classified into two parts, fixed cost and variable cost. There is not cost other than fixed and variable.
- There is a relevant range of validity (activity) for using the results of the analysis and sales price does not change as units of sales change.
- There is only one product or in case of multiple products, the sales mix among the products remain constant.
- Basic management policy about operation will not change materially in short run.
- The general price level (inflation/deflation) will remains essentially stable in the short run.
- Sales and production levels are synchronized, that is inventory remains essentially constant or zero.
- Efficiency and productivity per person will remains essentially unchanged in the short run.

If any of the above assumption were changed, revised budget would be needed for a new analysis.

### **2.1.10.2.3 Limitations of Break-even Analysis**

Break-even analysis in many business situations can be used for effective decision making, but there are many short coming limitations in its analysis and interpretations. Some of these can be listed as (Maheshwari, 2000:C.183-C.184)

- The assumption of producer's market phenomenon may not hold good for all types of commodities.
- The fixed costs may not remain constant as well as the variable costs may not vary in fixed proportions at different levels of output.
- With variation in the prices of the items or services which also depend on the factors affecting its demand and supply will certainly affect the demand of the commodity. This phenomenon is not covered in break-even analysis.
- Identification of fixed and variable costs involved in production process is very complicated. A shift in product mix may change the break-even point.
- Consumers may be given certain discount on purchases to promote sales. This revenue may not be perfectly variable with level of sales output.

### 2.1.10.3 Profit-Volume Analysis

The analysis of relationship between profit and volume is known as profit-volume analysis. The two factors profit and volume are interconnected and dependent with each other. Profit depends upon sales; selling price to a greater extent will depend upon the volume of production. Thus, the entire gamut of profit planning is associated with cost-volume-profit inter-relationship.

#### **Profit / Volume Ratio**

This term is important for studying the profitability of operations of a business. Profit/volume ratio (i.e. P/V ratio) establishes a relationship between the contribution and the sales value. The ratio can be shown in the form of a percentage also. The formula can be expressed by (Maheshwari, 2000:C.184)

$$P/V \text{ ratio} = \frac{\text{Contribution}}{\text{Sales}} \times \frac{S - ZVC}{S} \times 100 \frac{VC}{S}$$

This ratio can also be called as contribution margin ratio. This ratio can also be known by comparing the change in contribution to change in sales or change in profit to change in sales. Any increase in contribution would mean increase in profit only because fixed costs are assumed to be constant at all level of production. Thus (Maheshwari, 2000:C.185)

$$P/V \text{ ratio} = \frac{\text{Changes in Contribution}}{\text{Change in Sales}} \times \frac{\text{Change in Profit}}{\text{Change in Sales}}$$

This ratio would remain constant at different levels of production since variable costs as a proportion to sales remain constant at various levels. This ratio is useful for determination of the desired level of output or profit

and for the calculation of variable costs for any value sales. The variable cost can be expressed as under:

$$VC = \text{Sales} (1 - P/V \text{ ratio})$$

Comparison of different P/V ratios is usually made by the management to find out which product is more profitable. Management tries to increase the value of the ratio by reducing the variable cost or by increasing the selling prices.

### **2.1.11 Economic Characteristics of Cost-Volume-Profit Analysis**

Where cost-volume-profit analysis are reasonably accurate, they can help management decision-making. Essentially, CVP analysis offers greater insight into the economic characteristics of a company and may be used to determine the approximate effect of various alternatives. CVP analysis is based on estimates, however, and the arithmetical manipulations generally involve averages; hence the results should never be interpreted as precise. Rather, the analysis may be characterized appropriately as a 'slide-rule' approach that may be used to develop and test, with a minimum of effort, the approximate effect on costs and profits of several types of management decisions. (Welsch, 1979: 467-468)

## **Sales Volume**

### **Chart: Break-even Chart with Economic Characteristics**

Above break-even chart with economic characteristics indicates few of the economic characteristics of a business, which are (Welsch, 1979:468)

- Fixed costs, variable costs and total costs at varying volumes.
- The profit and loss potential, before and after income taxes, at varying volumes.
- The margin of safety- the relationship of budget volume to break-even volume.
- The break-even point.
- The preferred dividend or danger point- the point below which preferred dividends are not earned.
- The dead point-the point where management earns only the 'going'

rate on the investment.

- The common dividend or unhealthy point- the point below which earnings are insufficient to pay the preferred dividends and the expected dividend on the common stock.

All these points, and as others, can be computed if data are developed for cost-volume-profit purposes.

### **2.1.12 Margin of Safety**

Margin of safety is the excess of budgeted or actual sales over the break-even sales volume. In other words, it is the difference between the budgeted or actual sales revenue and the break-even sales revenue. It is a position above the break-even point. It gives management a feel for how close projected operations are to be organization's break-even point. Managers often consider the size of the company's margin of safety when making decisions about various business opportunities. The larger is the safety margin, the greater is the chances for the company to earn profit (i.e. Larger the margin of safety, safer the company). A high margin of safety is particularly significant in times of depression when the demand for the company's or firm's product is falling. A low margin of safety may result for a firm which has a low contribution ratio. When both the margin of safety and the P/V ratio are low, management should think of the possibilities of increasing the selling price, provided it does not adversely affect the sales volume, or reducing variable costs by bringing improvement in the manufacturing process. Margin of safety can be ascertained by using the following formula (Munankarmi, 2003:127)

Margin of Safety= (Actual Sales Value–Break-even Sales Value)

$$= \frac{\text{Profit}}{\text{Profit Z Volume Ratio}} \text{ in Amount.}$$

$$= \frac{\text{Profit}}{\text{Unit Contribution Margin}} \text{ in Units.}$$

The relation between margin of safety and actual sales is known as margin of safety ratio, which is determined as follows (Munankarmi, 2003:127)

$$\text{Margin of Safety Ratio} = \frac{\text{Actual Sales Z Break Even Sales}}{\text{Actual Sales}}$$

The following steps are needed to rectify margin of safety:

- With increasing selling price.
- With increasing sales volume, if the capacity of fixed cost is not fully utilized.
- With reducing fixed cost if possible.
- With reducing variable cost (with reducing the cost of raw materials, wages and other direct cost.)
- With substituting product line by more profitable one.

### **2.1.13 Cost-Volume-Profit Analysis for a Multi-Product Firm**

The relative proportion of sales of product is called the sales mix or the product mix. In the case of a multi-product firm, the contribution for each product can be found out by deducting its variable costs from sales revenue. The break-even point for each product can be calculated only if the total fixed costs of the firm are distributed and fixed cost for each product is known. The firm's overall break-even point can be calculated by dividing the total fixed costs by the contribution ratio for



the firm. The multi-product firm's P/V ratio will be the weighted average of the P/V ratios for all the products, the weights being the relative proportion of each product's sale. The P/V ratio for the multi-product firm can also be calculated by dividing the total contribution from all products by total sales.

A change in the product mix will not affect the firm's break-even point and profit if each product has the same P/V ratio. However, a change in the product mix will change the break-even point and profit when products have unequal P/V ratios. (Maheshwari, 2000:C.187)

### **Break-even Point for Multi-product Company/Firm**

In multi-product firm we have to calculate the BEP in aggregate. The sales mix is used to compute a weighted average unit contribution. This is the average of the several product unit contribution margin weighted by the relative sales proportion of each product.

Following procedures are followed to calculate BEP for sales mix or multi-product (Munankarmi, 2003:137)

- Calculate Contribution Margin or Profit-volume Ratio for each Product.
- Calculate Proportion of Sales mix in Units or Values as follows:

$$\text{Sales Mix} = \frac{\text{Individual Product's Sales Units or Value}}{\text{Total of all Product's Sales Units or Value}}$$

- Calculate Weighted average for all Products as Follows:

$$\text{Weighted Average} = [\text{Sales Mix (units)} \times \text{Unit Contribution Margin}]$$

$$\text{Or,} \quad = [\text{Sales Mix (Value)} \times \text{P/V Ratio}]$$

- Calculate Break-even Point (BEP):

$$\text{Break-even Point} = \frac{\text{Fixed Cost}}{\text{Weighted Average}}$$

#### **2.1.14 Cost-Volume-Profit Analysis and Limiting Factors**

CVP analysis is helpful in profit planning and a company will be able to produce any number of output of its choice (desires). But in real word it is not possible, because of some critical factors like finishing machine or raw material or labour. These critical factor in the CVP analysis is known as constraint.

#### **2.1.15 CVP Analysis with a Single Constraints**

Scarce resource should be efficiently allocated in order to maximize the contribution margin. A particular simple and instructive situation arises when there is only one constraining resource. This can occur if the firm products are all produced on a single machine and output is limited by hours available on this machine. In the same way, single resource constraint arise, if the firm's products are all produced with only one material and output is limited by quantity available for that materials. When there is a constraint for a scarce resource to have alternative uses, the contribution per unit should be calculated for each of these uses. Then, the available capacity for such scarce resource' should be allocated to the alternative uses on the basis of contribution per scarce resource. (Munankarmi, 2003:146)

#### **2.1.16 CVP Analysis with a Multiple Constraints**

Where more than one scarce resource exists, the optimum

production programme can not easily be established by the simple process applied in single resource constraint. Under the circumstances simple allocation of resource or the basis of contribution margin per unit is neither feasible nor desirable. Contribution margin per unit of scarce resources may be different for different scarce resources may be the ranking of product; because production processes are affected by many constrains factors rather than single constraint. In such situation, Linear Programming technique may be used to optimize product mix. The linear programming formulation is required to determine a production plan that maximizes contribution from the product mix. Linear programming is a mathematical technique which shows how to arrive at the optimum results, allocation available resources in a meaningful manner. It is basically concerned with the problem of allocating limit resources among competitive activities in an optimal manner. It is a technique to optimize the allocation of scarce resources in product mix problems which provides a valuable extension to cost-volume-profit analysis. (Munankarmi, 2003:148)

### **2.1.17 Analysis under Condition of Uncertainty**

CVP analysis have been used for various purposes such as choosing between machine and products, planning of profit and most significantly fixing up of selling price. Management has used this as a conveniently tools of profit planning without giving consideration of risk and uncertainty involved in it. Although, margin of safety ratio explains the degree of sensitivity of the project and product in general but it fails to explain the among of certainty in the product and also between the alternatives. To overcome such a difficulty, risk and uncertainty analysis like in any other management decision making can also be used in CVP analysis.

Probability distribution approach is a simple statistical tools which may be used to measure the risk and uncertainty involved in CVP analysis. A probability distribution theory normally suggests for postulation of various possibility of happening of the event in consideration. This may be done either taking into consideration of the experience in the past or may be done by considering the personal intuition of the persons doing so. In business reference of past experience are hardly available not a person is likely to behave in the same manner in the similar situation in different time. Therefore, personal judgment plays significant role in the management decision making. The condition thus, postulated are assigned probability (i.e. ones judgment towards likeliness of happening of the condition forecasted). It must be understood here that probability assigned here is a subjective probability based in, personal judgment of the man making such a analysis. (Pandey, 2003:17)

#### **2.1.18 Step (Jumping) Fixed Cost and Multiple BEP**

Break-even point is determined by dividing the fixed costs by the contribution margin per unit. If the fixed cost jumping one (i.e. step fixed) then it is required to be considered a different amount of fixed cost corresponding to each step. As such, BEP is computed for each level of fixed cost. Some of these computed BEP may not be feasible because they may violate the limits imposed by the relevant range corresponding to the level of fixed costs considered in their computation. As a result real or actual BEP is determined through Trial and Error Approach, (Munankarni, 2003:136)

#### **2.1.19 Assumptions Underlying CVP Analysis**

Break-even analysis is the most useful technique of profit planning and control. It is a device to explain the relationship between cost, volume

and profit. The discussion of the CVP analysis (or break-even analysis) so far is based on the following assumptions. (Pandey, 1994:241)

- **Cost Segregation:** The total costs can be separated into fixed and variable components. Constant fixed cost is the total fixed cost that remains unchanged with changes in sales volume. Constant unit variable cost is the variable cost per unit is constant and total variable cost changes in direct proportion to the sales volume.
- **Constant Selling Price:** The selling price per unit remains the constant; that is, it does not change with volume or because of other factors.
- **Constant Sales Mix:** The firm manufactures only one product or if there are multiple products, the sales mix does not change.
- **Synchronized Production and Sales:** Production and sales are synchronized, that is, inventories remain the same.

#### **2.1.20 Limitations of CVP Analysis**

Assumptions limit the utility and general applicability of the CVP analysis. Therefore, the analysis should recognize these limitations and adjust data, wherever possible, to get meaningful results. The CVP analysis suffers from the following limitations. (Pandey, 1999:214)

- It is difficult to separate costs into fixed and variable components.
- It is not correct to assume that total fixed cost would remain unchanged over the entire range of volume.
- The assumptions of constant selling price and unit variable cost is

not valid.

- It is difficult to use the break-even analysis for a multi product firm.
- The break-even analysis is a short run concept and has a limited use in long range planning.
- The break-even analysis is a statistic tools.

### **2.1.21 Special Problems in Cost-Volume-Profit Analysis**

Cost-volume-profit analysis are applied to individual products or parts of a business and all the products or activities combined. In the latter case, there are three special problems may be encountered (Welsch, Hilton and Gordon, 2001:513-518)

- **The Activity Base:** When two or more products or activities are combined for breakeven analysis, the activity base is usually in amount. Product unit is used for single product. The activity base must be in additive units using a common denominator of volume or output in multiple products. Therefore, for the company as a whole, net sales amount are usually the only satisfactory common denominator because manufacturing, selling and administrative activities are expressed in combination.
- **The Change in Inventory:** Usually the budgeted changes in inventories (i.e. finished goods and work-in-process) are immaterial in amount and thus may be disregarded in cost-volume-profit analysis. On the other hand, when the change in budgeted inventory is significant, it should be included in the analysis. Including the effect of inventory changes in cost-volume-

profit analysis requires subjective judgments about what management might do (about making inventory changes) at different volume levels and the conceptual precision that is desired. Management consider two practical approaches or policies in inventory changes often used: (a) Disregard the inventory changes (b) Include the inventory changes.

- **The Non-Operating Incomes and Expenses:** Non-operating incomes (gains) and expenses (losses) and extra-ordinary gains and losses, if material in amount, cause another problem in CVP analysis. The basic issue is whether they should be included or excluded. Extra-ordinary gains and losses are non-recurring and unusual; therefore, they should be excluded. Non-operating incomes and expenses are recurring but they are not related to ongoing operations. Management consider the policy may be to: (a) Include the non-operating incomes and expenses, (b) Exclude the non-operating incomes and expenses.

### **2.1.22 Cost Structure and Operating Leverage**

#### **Cost Structure**

Cost structure refers to the relative proportion of fixed and variable cost in an organization. The relationship of a company's variable and fixed costs is reflected in its operating leverage. The highly labour intensive organizations have high variable cost and low fixed cost and thus have low operating leverage and a relatively low break-even point. Conversely, organizations that are highly capital-intensive have a cost structure that includes low variable and high fixed costs. Such a structure reflects high operating leverage and relatively high break-even point. Company with lower fixed costs and higher variable costs will enjoy

greater stability in net income and will be more protected from losses during bad years but at the cost of lower net income in good years'. (Munnakarmi, 2003:145)

### **Operating Leverage**

Operating leverage is a measure of the extent to which fixed costs are being used in organization. The relationship of a company's variable and fixed costs is reflected in its operating leverage. Generally highly labour intensive organizations have high variable costs and low fixed costs and this has low operating leverage and a relatively low break-even point. Conversely, organizations that are highly capital intensive have a cost structure that includes low variable and high fixed costs which reflects high operating leverage with high break-even point. It shows that fixed costs and operating leverage has a direct relationship. Higher the amount of fixed costs higher the operating leverage and break-even point and vice versa. In other words, the firm with relatively high operating leverage has proportionally high fixed expenses, the firm's break-even point will be relatively high. The operating leverage, factory is determined as under (Munakurmi, 2003:145)

$$\text{Degree of Operating Leverage} = \frac{\text{Contribution Margin}}{\text{Net Income}}$$

#### **2.1.23 Segregation of Semi-Variable (Mixed) Costs**

Cost-volume-profit analysis requires segregation of all costs between two parts: Fixed and variable. This means that the semi-variable cost will have to be segregated into fixed and variable elements. This may be done by any one of the following methods (Maheshwari, 2000:C.162-C.165)



### **i. Levels of Output Compared to Levels of Expenses Method**

According to this method, the output at two different levels is compared with corresponding level of expenses. Since the fixed expense remain constant, the variable overheads are arrived at by the ratio of change in expenses to change in output. Whereas;

$$\text{Variable Elements} = \frac{\text{Change in Amount of Expenses}}{\text{Change in Activity or Quantity}}$$

### **ii. Range Method**

This method is similar to levels of output compared to levels of expenses method except that only the highest and lowest points of output are considered out of various level. This method is also designated as 'High and Low' method. The high-low method is explained, step-by-step, as follows:

- a. Select the highest pair and the lowest pair
- b. Compute the variable rate 'b' using the formula.

$$\text{Variable Rate} = \frac{\text{Difference in cost 'y'}}{\text{Difference in activity 'x'}}$$

- c. Compute the fixed cost portion as:

$$(\text{Fixed cost portion} = \text{Total semi-variable cost} - \text{Variable cost})$$

### **iii. Degree of Variability Method**

In this method, degree of variability is noted for each item of semi-variable expenses. Some semi-variable items may have 30%

variability while others may have 70% variability. The method is easy to apply but difficulty is faced in determining the degree of variability.

#### **iv Scatter-graph Method**

In this method, the given data are plotted on a graph paper and line of best fit is drawn, whereas semi-variable expenses is plotted on the vertical axis (Y-axis) and activity measure is plotted on the horizontal axis (X- axis). The method is explained below:-

- a. The volume of production is plotted on the horizontal axis and the costs are plotted on the vertical axis.
- b. Corresponding to each volume of production costs are then plotted on the paper, thus, several point are shown on it.
- c. A straight line of best fit is then drawn through the points plotted. This is the total cost line. The point where this line intersects the vertical axis is taken to be the amount of fixed element.
- d. A line parallel to the horizontal axis is drawn from the point where the line of best fit intersects the vertical axis. This is the fixed cost line.
- e. The variable cost at any level can be known by noting difference between fixed cost and total cost lines.

The scatter-graph method is relatively easy to use and simple to understand. However, it should be used with extreme caution, because it does not provide an objective test for assuring that the regression line drawn is the most accurate fit for the underlying observations.

#### **v. Method of Least Squares**

One popularly used method for estimating the cost-volume formula is regression analysis. Regression analysis is a statistical procedure for estimating mathematically, the average relationship between the dependent variable (y) and the independent variable (x). The regression method does include all the observed data and attempts to find a line of best fit. To find the line of best fit, a technique called the method of least squares is used. Method of least squares is based on the mathematical technique of fitting an equation with the help of a number of observations. The linear equation, (i.e. a straight line equation) can be assumed as

$Y = a + bx$  and the various sub-equations shall be;

$$y = a + bX,$$

$$xy = a x + b x^2$$

An equation of second order, (i.e., a curvilinear equation can be drawn as;

$Y = a + bx + cx^2$  and the various sub-equations to solve it. i.e., to find out the values of constant a, b and c shall be:

$$y = a + b x + c x^2$$

$$xy = a x + b x^2 + C x^3,$$

$$x^2y = a x^2 + b x^3 + C x^4,$$

Similarly, the equation can be fitted for any number of order or degree depending upon the number of observations available and the accuracy desired.

Compute the per unit variable cost (b) and fixed cost (a) by using the following formula:

$$b = \frac{N \sum xy - \sum x \sum y}{N \sum x^2 - \frac{(\sum x)^2}{N}}$$

$$a = \frac{\sum y - b \sum x}{N}$$

Where,

Y = Total Cost,

a = Fixed Cost

b = Variable Cost Per Unit

x = Production Units

N = No. of Series

Z = Sum of

### 2.1.24 Impact of Changes on Profits

Profit is the function of a variety of factors: it is affected by changes in volume, cost and prices. Profits may be affected by the changes, (increases or decreases), in the following factors (Pandey, 1999:203-208)

- **Effect of Price Changes:** An increase in the selling price will increase the P/V ratio and, as a result, will lower the break-even point. On the contrary, a decrease in selling price will reduce the P/V ratio and therefore, result in a higher break-even point.
- **Effect of Volume Changes:** A change in volume, not accompanied with a change in the selling price and/or costs, will not affect P/V ratio. As a result, the break-even point remains unchanged. Profit will increase with an increase in volume and will be reduced with a decrease in volume.
- **Effect of Price and Volume Changes:** A change in price

invariably affects volume. A price reduction may increase demand of the product and consequently, may result in increased volume. On the other hand, increase in price may adversely affect the demand and thus, reduce volume. The impact on profits under these circumstances is not obvious. Profit may increase with a price reduction if volume increase substantially. Similarly, a price rise may reduce profits if there is material fall in volume.

- **Effect of Changes in Variable Costs:** The impact of the changes in variable costs on profits is straight forward if it does not cause any change in selling price and/or volume. An increase in variable costs will lower P/V ratio, push up the BEP and reduce profits. On the other hand, if the variable costs decline, P/V ratio will increase, BEP will be lowered and profit would rise.
- **Effect of Changes in Fixed Costs:** A change in fixed cost does not influence P/V ratio. Other factors remaining unchanged, a fall in the fixed costs will, however, lower the BEP and raise profits. An increase in fixed costs, caused either due to some external factors or due to some changes in the management policy, will raise the BEP. Increase in factory rent or insurance and taxes are examples of external factors, while increased depreciation or salaries of managers may be the result of management decisions.
- **Effect of Changes in a Combination of Factors:** The financial manager or the management accountant, evaluating the profit plans or budgets, must realize that a change in one factor

leads to a changes in an other factors. Therefore, all such changes should be carefully visualized and their net impact on profit must be seen.

## **2.2 A Brief Review of Previous Research Work**

Literature review is the study of past research. Review of literature is an essential part of all studies. The purpose of literature review is to find out what research studies have been conducted in one's chosen field of study and what remains to be done? Many researches have been made in the area of profit, planning and control and management accounting etc. in Nepalese context. But there are very few research papers concerning cost volume profit analysis has been conducted. So an attempt is made here to review some of the researches, which have been submitted in profit planning and control, as well as management, accounting. As CVP analysis is one of the major tools of PPC, the previous studies related to PPC are reviewed.

2.2.1 Mr Khagendra Prasad Ojha (1995) had conducted a research entitled "Profit Planning in Manufacturing Public Enterprises: A Case Study of Royal Drugs Limited and Herbal Production and Processing Company Limited". This research of Mr. Ojha was mainly centered with the current practice of profit planning and its effectiveness in RDL and HPPCL.

The time period covered by this research was six years from FY 046/047 to FY 051/052. The data and other necessary information were collected by using secondary as well as primary sources of data. In his research Mr. Ojha has pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. Objectives of Nepalese public enterprises are not clear. Conflict between social objectives and profit objectives are hindering profit planning program of PEs.
2. These companies have no broad objectives to operate with a positive and dynamic philosophy of management, which is vital to a competitive and growing company. Furthermore these companies have no major programs to increase the expertise of management of all level and to take full advantage of the latest techniques and innovation was they are developed.
3. Nepalese public enterprises are not successful to maintain coordination within organization. They are suffering from departmental and staff conflict. This conflict has been raised mainly due to the lack in defining the line and staff responsibility clearly. Due to the manager's personal ego, there is no cooperation and help between planning and accounting department.
4. Another major problem of Nepalese PEs is behavioural. But the PEs have made no attempt to solve behavioural problem.
5. Pricing system of Nepalese PEs is not scientific, PEs adopt traditional pricing methods. Usually cost plus pricing method is applied to determine price, certain products are priced, below costs as per HMG circulars.
6. Price-Cost-Volume relationships are not considered when developing sales and pricing strategy.
7. Sales achievements are below sales targets. This also signals that sales plan are not made by considering all components affecting sales.

8. PEs are failure in achievements due to the inadequate evaluation of internal and external variables.

Recommendations: Some remarkable recommendations were as follows;

1. Objectives are the ends which an enterprise seeks to achieve. Nepalese PEs should clearly define their objectives.
2. Profit, planning manuals should be communicated from top to lower levels. All personnel should participate on decision making and planning process.
3. Nepalese PEs should tackle the behavioral problems in organization.
4. Sales forecasting should be made on the realistic ground. Forecasts should include strategic and tactical forecasts that are consistent with the time dimensions used in the comprehensive profit plans.
5. Prices and supply qualities should be so determined that so far as possible, marginal revenues should equal to marginal costs. HMG should not interfere in price fixation. Management of these enterprises should be made responsible and accountable for failure to meet reasonable return on investment.
6. Price-cost-volume relationships should be taken into consideration while developing sales plan and strategies.
7. Since external variables exert major influences on the enterprises. HPPC and RDL and all PEs should adequately identify and evaluate these variables. These enterprises should have an in-depth analysis of the company's strengths and weakness.



8. A systematic approach to comprehensive profit planning is essential in the PEs in Nepal. To adopt this approach, planning experts should be trained.

2.2.2. Mr. Gunakar Bhatta (1998) had conducted a research in the topic "Profit planning in Nepal Electricity Authority". He has tried to examine whether the NEA is applying profit-planning system properly or not and analyze if there is any drawback in profit planning system of the authority.

The time period covered by this research was five years from FY 2049/50 to FY 2053/54. The data and other necessary information were collected by using secondary as well as primary sources of data. In his research Mr. Bhatta Pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. The NEA has high amount of fixed costs and the interest payable on long term loans every year comprises the considerable portion of fixed cost.
2. Electricity leakage, theft and wastage are on of the remarkable problem of NEA and it is reducing the profit earning capacity of the authority.
3. Overhead budget is not prepared in scientific and systematic way. All expenses are shown under only one overhead budget named as "Operation and maintenance expenditure budget".
4. There is the absence of effective utilization of assets. In comparison with the amount tied up in total assets, assets turnover ratio is poor.

5. NEA prepares both long term and short term profit plans, but long-term profit plan is confined only to the top-level executives.
6. Cost volume profit relationships are not considered while developing the sales plan and pricing strategy.
7. There are no clear-cut boundaries to separate cost into fixed and variable. The cost classification is no scientific and systematic.
8. Management is in the lack of adequate knowledge about the profit planning, corporate planning, participative management, evaluation of broad and long-range objectives and coordination system in the organization.

Recommendation: Some remarkable recommendations were as follows:

1. NEA must restructure its capital structure and should emphasize the internal financing to minimize the burden of high interest in long-term loans. For this, it can issue shares and can refund the debt.
2. Leakage of electricity should be controlled. For this, meter reading and meter joining system should be improved. The most important aspect is to motivate its employees engaged in transmission and distribution line to control the leakage.
3. NEA should develop its overhead budget in a well-classified and scientific way.
4. There should be proper coordination between various directorates of the authority in regard of budget formulation and implementation of the budget.

5. Cost volume profit relationship should be considered while formulating profit plan and the Authority should be accustomed with flexible budget system.
6. Cost should be clearly identified as fixed and variable.
7. NEA should improve co-ordination between various directorates.
8. Regular inspection and monitoring of budget centers should be undertaken by the center level.

2.2.3 Mr. Yam Bahadur Limbu (1999) had conducted a research in the topic "An Analysis of Revenue Collection of NEA". This research of MR. Limbu was mainly centered with identify the weakness and strength of current strategies of revenue collection of NEA.

The time period covered by this research was ten years form FY 1987/88 to FY 1996/97. The data and other necessary information's were collected by using primary as well as secondary sources of data. Mr. Limbu has pointed out various findings and recommendations in his research.

Findings: Some remarkable findings were as follows:

1. The revenue is increasing, both total and average revenue are fluctuated.
2. NEA is not generating proper revenue due to losses of power in generation, transmission and distribution sector.
3. Per staff Power production and annual sales of the staff of hydropower sector in Nepal found to be the least out of all countries of Asia.

4. It is observed that NEA is seriously suffering to control operating cost. Mainly the FY 1989-1993 indicated to high operating cost which was above the sales revenue which shows NEA was not able to apply effective management in controlling operating expenses.
5. NEA could not maintain its stability in revenue collection due to lack of proper revenue, collection strategies, active internal management policy and effective government policy.
6. Leakage of power is high due to technical or others reasons which has been affecting on operational and financial sectors of NEA.

Recommendations: Some remarkable recommendations were as follows;

1. The revenue is more fluctuated year by year which should be considered by NEA to make it stable increment.
2. NEA should give adequate emphasis for the improvement of efficient revenue collection system.
3. NEA should properly manage the operating as well as non-operating expenditures.
4. The revenue section should build up a management information system to help top-level management to take timely and appropriate action.

2.2.4 Mr. Dinesh Kumar Uprety (1998) had conducted a research in the topic "An Analysis of Profitability Performance of NEA". In terms of profitability and rate of return on the basis of selective financial tools. Mr. Uperty has pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. NEA is not successful over the study period to earn a fair rate of return from its operation. Net profits are negative in some year. The causes of this low profitability are a huge amount of operations expenditure and general expenditures.
2. The efficient utilization of fixed and other assets of NEA has become a major cause for its low profitability. The investment in assets has almost only 9 times increased than the initial position. This indicates that NEA's management has become failure to properly utilize its assets.
3. The amount of capital in the form of equity and long-term liability has shown the tendency of annual increase. The funds are tied up in account receivable, advance recoverable and inventory which are not productive.

Recommendations: Some remarkable recommendations were as follows:

1. To achieve target growth rate in sales revenue, NEA should make realistic forecasts.
2. The authority should maintain its periodic performance report systematically and variance analysis should be effective to NEA.
3. The authority should reduce the maintenance and operation expenditure to maximize its operating profit. For this purpose cost control program can be done and alternative for the replacement of long-term loan should be decreased.

2.2.5 Mr. Gogindar Goet (1999) had conducted a research on the topic "Revenue Planning and Management in Nepal: A Case Study of Nepal

Electricity Authority". This research of Mr. Goet mainly centered with the revenue management and planning process in NEA.

The time period covered by this research was five years from FY 1993/94 to 1997/98. From this research was based on secondary sources of data. In his research Mr. Goet has pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. NEA has not considered major demand determinants of electricity such as family income, price of electricity, connection charges, cost of alternative, cost of auto generation and reliability of NEA service.
2. NEA has not adopted practice of preparing monthly budget.
3. The revenues plans prepared by the branches and sub-branches are not used to prepared central revenue plan.
4. Meter readers are not rotated and there is no surprise meter reading.
5. A large number of customer have been charged only the minimum charges due to the absence of actual meter reading.
6. Operating cost of NEA consists huge amount of fixed costs.
7. Operating cost increasing rapidly than production capacity, sales unit and sales revenue.

Recommendations: Some remarkable recommendations were as follows:

1. NEA planners should be properly trained about budgeting and revenue planning.

2. NEA should consider demand determinants such as family income, price of electricity, connection charges, cost of alternative available, cost of self-generation of electricity and reliability of NEA service while forecasting demand.
3. NEA should start the practice of preparing monthly budget for sales revenue.
4. While preparing central budget of NEA, it should take into account all the suggestions made by branches and sub-braches.
5. The meter readers should be periodically rotated between various areas and NEA should obtain surprise meter readings.
6. Billing should be based on actual meter reading.
7. NEA should reduce its huge amount of fixed cost resulting from over-staffing, fuel, and other overheads.
8. NEA should set clear-cut boundaries about fixed and variable cost.
9. Price cost volume profit relationship should be considered while formulating the revenue plan.

2.2.6 Mr. Sagar Sharma (2002) had conducted a research on the topic "Management Accounting Practices in the Listed Companies of Nepal". This research of Mr. Sharma was mainly centered with the study and examines the present practice of management accounting tools in the listed companies in Nepal. This research is based on primary data only. No secondary data has been used for this research. Mr. Sharma has pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. To carryout operational activities properly, companies mostly practiced preparation of Master budget.
2. While preparing the budget, there was no practice of taking consultancy service.
3. Regarding cost segregation into fixed and variable, it was found that 62% of the total companies practiced cost segregation but most of the companies segregated it on judgmental basis.
4. The technique of "least square method" was not practiced by any of the companies in Nepal to segregate mixed cost into fixed and variable.
5. It was found that management accounting tools were in practice in one way or the other but companies were practicing most of the privileged tools of management accounting such as sensitivity analysis, judgmental analysis, past actual expenses basis for budget preparation.

Recommendations: Some remarkable recommendations were as follows:

1. To implement the tools congenial environment is a must. For this sake, a separate management accounting department should be establish within an organization, management accounting should be hired.
2. While preparing budgeting and planning activities, companies should hire professional expert.
3. Listed companies of Nepal should practice allocation of joint cost among the departments, divisions and units. So that cost consumption rate per division, department or unit can be



ascertained which helps in decision-making regarding cost. Proper allocation of joint cost is a must in every company.

4. Nepalese companies should be updated with new tools that are practiced around the globe in best performing companies.
5. For planning activities tool like budgeting, cost volume profit analysis, linear programming model of planning can be used.

2.2.7 Mr. Kamal Raj Joshi (2004) had conducted a research entitled "Revenue Planning and Cash Management of NEA". This research of Mr. Joshi mainly focused with revenue planning-policies and practices and cash management in NEA.

The time period covered by this research was six years from FY 2054/55 to FY 2059/60. The data and other necessary information collected from both secondary and primary sources of data. In his research, Mr. Joshi has pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. NEA has not adopted practice of preparing monthly budget.
2. Numbers of customers are increased year by year, but the actual consumption of electricity could not be increased as the ratio of increasing customers.
3. Profitability ratio indicates that the higher operating expenses, as a result of operating profit and net profit are not sufficient.
4. NEA is paying a huge amount of cash as interest of long-term loan, because of overloading of debt.

5. Net fixed assets and total assets turnover ratio shows that the huge amount has been invested to purchase fixed and current assets have not been utilized properly.
6. NEA has not practiced the international accounting standard.
7. The authority does not maintain its periodic performance reports systematically.

Recommendations: Some remarkable recommendations were as follows:

1. NEA should start the practice of preparing monthly budget for sales revenue.
2. Almost 96% of total customers are engaged with domestic category but the actual consumption is not satisfied. So, NEA should be made the effective plan and programmed for increasing consumption rate. For this purpose, NEA can apply the discount policy on consumption rate, low charge at time period consumption. i.e. raining season and winter season consumption.
3. NEA is paying a huge amount as interest on long-term long, which is not good for authority. So it should emphasized internal financing to minimize such burden. Therefore, NEA must restructure its capital structure and for this issue the shares and can refund the debt.
4. NEA has invested big amount in fixed assets but its turnover ratio shows the poor utilization of fixed assets. Therefore, NEA should put stress on effective utilization of fixed assets.
5. NEA should prepare the budget based on the principles of programming and performance budgeting. As the objective of the

programming and performance budgeting is result oriented, it will help NEA to analysis it's real achievement.

2.2.8 Mr. Ghana Shyam Thapa (2004) had conducted a research on topic "Profit Planning in Nepalese Public Enterprises: A Case Study of Nepal Electricity Authority". MR. Thapa had concerned his study to examine the present profit planning premises adopted by the NEA.

The time period covered by the research was five year from FY 2055/56 to 2059/60. The necessary information's and data were accumulated from secondary sources of data. In his research Mr. Thapa has pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. NEA prepares both tactical and strategic profit plan but strategic plan is confined only to the top-level executives.
2. Present power distribution system of NEA is not sufficiently efficient. Power loss unit is increasing in each year.
3. NEA is succeeded to achieve break-even point in sales volume.
4. NEA has not utilized its available capacity satisfactorily. NEA can only achieve at BEP at 60 percent capacity utilization. But NEA is running at below 60 percent capacity.
5. There is lack of proper co-ordination between various directorates in regard of the goals, objectives and strategies.
6. Due to the poor assets turnover ratio, it to be said that there is absence of effective utilization of assets.

Recommendations: Some remarkable recommendations were as follows:

1. A Systematic approach to comprehensive profit planning and control is essential. To adopt this approach, existing planners should be trained and new planner should be hired. This can contribute to increase the profitability of NEA.
2. Amount of electricity loss is increasing each year. NEA should adopt appropriate control measures to reduce such loss.
3. Cost volume profit relationship should be considered while developing the sales plan and pricing strategy.
4. There should be proper capacity management to increase its available capacity utilization.
5. NEA should have proper coordination regarding budget formulation, implementation and evaluation of achievement.
6. NEA should be ready to reduce operating cost upto reasonable extent. The cost reduction is a key measure to increase the volume of profit. Optimum staffing concept should be followed by NEA.
7. NEA should invest the available resources properly. NEA should consider cost-benefit ratio in selection of projects.

2.2.9 Mr. Rabin Dahal (2005) had conducted a research on topic "Profit and Planning System and Financial Conditions of Nepal Electricity Authority", Mr. Dahal had concerned his study to examine the present comprehensive profit planning system applied in NEA and its effectiveness.

The study covered the time periods of five years from FY 1998/99 to 2002/03. Data and other information's collected from secondary sources

of data. In his research Mr. Dahal pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. There is a systematic sales budget and sales performance is satisfactory. The actual sales achievement of NEA is higher than the budgeted sales.
2. Overheads are not classified systematically and it creates problem to analyze its expenses properly.
3. NEA is paying a huge amount of interest every year and it is suffering from high fixed cost.
4. The authority does not maintain its periodic performance report systematically.
5. NEA suffering from remarkable power loss.

Recommendations: Some remarkable recommendations were as follows:

1. NEA is paying a huge amount as interest on long-term loans, which is not good for authority. Therefore, NEA must restructure its capital structure and for this it can issue the shares and can refund the debt. It should emphasize internal financing.
2. NEA should clearly the costs as fixed, variable and semi-variable.
3. Cost volume profit relationship should be considered while developing the sales plan and pricing strategy.
4. The installed capacity of NEA should be utilized fully. It automatically reduce the operating cost.

5. Leakage of the electricity should be controlled, for this, meter reading and meter-joining system should be improved.
6. Cost control program should be established. It should maintain the discipline of budget.

2.2.10 Mr. Chiranjibi Acharya (2001) had conducted a research entitled "Profit Planning in Nepalese PEs: A Case Study of NEA", Mr. Acharya mainly focused on the practice and application of detailed and systematic approach of PPC and its effectiveness in NEA.

The study covered only the period of five years from FY 2051/52 to 2055/56. Data and other information's were collected from secondary sources of data. Mr. Acharya pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. NEA prepares both short-term and long-term profit planning but long-term profit plan is confined only to the top-level executives.
2. The authority is unable to manage its account receivables properly. Amount of accounts receivable is increasing each year.
3. Cost-volume profit relationship is not considered while developing the sales plan and pricing strategy.
4. Strength and weakness are not analyzed in depth by NEA because of the monopoly situation or the absence of competitors and it is not alert toward its possible threats and opportunity.
5. All the expenses such as manufacturing administrative and selling and distribution are not separated systematically. Authority has

combined all these expenses together and named it "Operation and Maintenance Expenditure Budget".

6. There is a large amount of cash and bank balance in balance sheet of NEA. It shows the inability of management of NEA because it is lying idle.

Recommendation: Some remarkable recommendations were as follows:

1. NEA should make the effective collection policies for its account receivables. As large amount of account receivable remain to government, semi-government and other public enterprises.
2. NEA should clearly classify as fixed, variable and semi-variable.
3. Even if the authority is operating in monopoly situation, strengths and weakness, threats and opportunity should be properly managed.
4. Overhead cost of NEA is large. It should be reduced and overhead budget should be separated in systematic and scientific way, production overhead, Administrative overhead and selling and distribution overhead budget should prepared separately.
5. Cost volume profit relationship should be considered while developing the sales plan and price strategy.

2.2.11 Mr. Madhav Rijal (2005) had conducted a research entitled "CVP Analysis as a Tools to Measure Effectiveness of PPC: A Case Study of NEBICO Private Limited" This research of Mr. Rijal Was mainly centered with the relationship of cost, volume and profit as applicable tools of budgeting.

The study covered only the period of five years from FY 2056/57 to 2060/61. Data and other information's collected from primary as well s secondary sources of data. Mr Rijal had pointed our various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. Company's variables cost is high proportion than fixed cost in total cost amount, which contribute for lower contribution margin.
2. There is lack of effective cost control programmes or techniques.
3. NEBICO Pvt. Ltd. has not proper practice o f segregating the costs into fixed and variable or controllable and non-controllable.
4. The pricing policy of the company is not scientific because BOD directly interference to price of biscuit and confectionary products.
5. The goal and objectives of the company are not clearly communicated to operating level of management.
6. In the company, there is no effective inventory policy. The inventory management, raw material handling and controlling system are not efficient and effective.

Recommendations: Some remarkable recommendations were as follows:

1. Classification of expenses item as variable and fixed or controllable and non-controllable must be made within a specific framework of responsibility and time.
2. Cost control department separately establishes which divided the cost by products and control the costs.



3. NEBICO should consider BEP analysis while preparing sales plan, production plan and setting the price of its products.
4. CVP analysis and PPC manuals should be communicated from top to lower levels. All personnel should be participated on decision making and planning process.
5. There is no effective inventory policy, so recommended that use the tools effectively for efficient inventory managements raw material handling and controlling system.

2.1.12 Mr. Tenzin Namdak (2005) had conducted a research in the topic "Cost-volume-profit analysis of DDC". MR. Namdak mainly centered with the relationship between cost, volume and profit as a tool of budgeting.

The study covered only the period of five years from FY 2055/56 to FY 2059/60. Data and other information's were collected from both primary and secondary sources of data. In his research Mr. Namdak pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. DDC hasn't been practicing CVP analysis till now and there is no method adopted to segregate fixed and variable cost.
2. DDC has high wages and either availability of manpower is more than requirement or inefficiency of the workers resulting in low productivity of labour.
3. The corporation has no effective inventory policy. Whatever, left over of production is considered as inventory.

4. The over-utilization of capacity of machines also couldn't cover the fixed cost and backfired by resulting in high repairs and maintenance cost etc.
5. Profitability in relation to sales is also too low. Operating cost constitutes more than the sales value in all the five years.

Recommendations: Some remarkable recommendation were as follows:

1. DDC should clearly defines its objectives into long-term goals and short term goals.
2. BEP analysis should be done while planning and segregation of cost should be done.
3. DDC should also consider the variable costs. It should reduce as much as it can, so as to increase contribution margin ratio.
4. DDC should also consider in buying new production plant that might reduce the unproductive employees and the over utilization of old plant, resulting in less investment in repairs and maintenance on such assets.
5. DDC should lay off unproductive employees that are causing extra burden of cost.

2.1.13 Mr. Rajendra Gurung (2008) had conducted a research in the topic "Cost Volume Profit Analysis of Public Enterprises in Nepal: Comparative Analysis between Nepal Telecom and Nepal Electricity Authority". This research of Mr. Gurung was mainly focused with the CVP analysis as major tools of budgeting.

The study covered only the period of five years from FY 2057/58 to 2061/62, data and other information's collected from primary as well as secondary sources of data. Mr. Gurung had pointed out various findings and recommendations.

Findings: Some remarkable findings were as follows:

1. Increasing cost in each fiscal year is another remarkable point for these enterprises. It has to be adopted the cost control measures.
2. There are no clear-cut boundaries to separate cost into fixed and variable. The cost classification is not scientific and systematic.
3. Margin of safety of Nepal telecom are in good where as NEA's is in negative.
4. The top-level executive are only involved in planning and decision making but lower level participation is not encouraged.
5. The expenditures ratio of NEA is higher than Nepal telecom so, profit ratio of NEA is lower than Nepal Telecom.

Recommendations: Some remarkable recommendations were as follows:

1. The income of both enterprises i.e. Nepal Telecom and NEA are increasing trends, which shows the status of both enterprises are better. But in reality the expenditures of NEA is higher than Nepal Telecom so, NEA should reduce its cost to get more profit in due course.
2. The margin of safety of Nepal Telecom is in increasing trends where as NEA is in decreasing trends. So, NEA should try to

increase their profit to expand the margin of safety in upcoming year.

3. Profit planning and control manuals should be communicated from top to lower levels. All personnel should be participated on decision making and planning process.
4. These enterprises should utilize the full installed capacity of fixed assets, which help to obtain more sales and minimize the operating cost too.
5. These enterprises should implement the proper method for segregating the cost into fixed and variable.

### **2.3 Research Gap and Justifications**

There is the gap between present research and the previous researches. Previous researches conducted on the study about revenue planning and overall aspect of PPC. Mostly, all the researches applied some statistical and financial tools and also findings and recommendations are very similar. So, there is a need for the specific study on CVP analysis of NEA.

Since NEA has been suffering losses year after year, the major causes of such losses should be find out and in-depth analysis should be done. Comprehensive profit planning and control techniques would not be effective to dig out the real causes. So CVP analysis is a supplementary tool of profit planning to find out the profitability of the short-term tactical plan, that's why to fill up these gap the current research is conducted. This research is financial and accounting data analysis types of research. It is mostly depends on secondary sources of data. The current research studies the CVP analysis as a tools of PPC and mainly

focused on major causes of such continuous losses and poor managerial and financial performance. In fact, this research is quite different from previous research.

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **3.1 General Meaning**

The systematic and well-organized way for solving the research problem can be referred to as research methodology. The present study has its objectives to analyze, examine and interpret various aspects of research work such as sales, costs and other aspects of cost volume profit analysis, related to effective tool of profit planning. To fulfill the objectives of the study, appropriate research methodology is followed:

The chapter looks into the research design, period covered by the study, sources of data, population and sample, analytical tools used, data processing and tabulation, research variables and research questions.

#### **3.2 Research Design**

The present study consists research design which is analytical and descriptive. It is mainly related with the quantitative plans and accounts of NEA. So analytical approach has been considerably adopted to present the data. But qualitative aspect of the research such as effectiveness of CVP in NEA, implementing the CVP, views of various manager and personnel and the theoretical prescription are explained in words where necessary.

#### **3.3 Period Covered by the study**

The period covered by the study is five years for the purpose of cost volume profit analysis. The period covered is from FY 2061/062 to 2065/66

### **3.4 Sources of Data**

Both the primary and secondary data have been used to meet specified objectives. Primary data are collected through questionnaire as well as direct interview with concerned authority of NEA. The secondary data are taken from annual reports, news bulletins, Vidhyut bulletins of NEA, journals, magazines, books, previous thesis, website etc.

### **3.5 Population and Sample**

NEA is a sample and population in itself. This study is based on cost-volume-profit analysis of NEA. Therefore, no particular branch or product is taken but the whole is considered for analysis through financial data available.

### **3.6 Analytical Tools Used**

Data collected from different sources are managed, analyzed and presented in systematic way in proper table and formats. To analyze the collected data, financial and statistical tools like regression, correlation, BEP, Bar-diagram, percentage, CVP analysis, Least square, time series analysis etc are used.

### **3.7 Research Variables**

The research variables used in the present study are sales, costs, profits, and loss, BEP, P/V ratio, profit margin

### **3.8 Research Questions**

Throughout the study, it is tried to answer the following questions:

1. What are the reasons of the financial loss?

2. To what extent is the process of CVP analysis followed in NEA?
3. What are the major problems faced by the management in developing and implementing the CVP analysis in NEA?
4. What steps should be taken to improve profit planning system in NEA?
5. What are the overall managerial problems and what suggestions can be recommended for their proper solution?



## **CHAPTER IV**

### **DATA PRESENTATION AND ANALYSIS**

Profit planning is used for development and acceptance of proper objectives and goals for an organization. A profit plan is a comprehensive and coordinated plan of an enterprise for some specific period in future. Planning is carried out to fulfill the responsibility of forward thinking and future operation of the organization. CVP analysis a tools of PPC, can be the most important device to utilize the cost with effective and efficient way. Cost control and profit planning are possible with the help of CVP analysis. CVP analysis is also considered as a powerful tool in managerial decision making especially cost control and profit planning. The CVP analysis is a specific way of presenting and studying the inter-relationship between costs, volumes and profits.

The basic objectives of the study is to examine CVP analysis to measure effectiveness of PPC, present practice of CVP analysis. This chapter presents the analysis and interpretation of the data.

To meet the objectives, the researcher has tried to presents and interprets the collected data in systematic manner and presented and tabulated in meaningful ways. For that purpose sales revenue, cost, profit, contribution margin, Break-even analysis, income statement, sensitivity test etc. are done, which are the major variables of CVP analysis.

#### **4.1 Revenue Plan of Nepal Electricity Authority**

Revenue planning are the necessary components of profit planning and control. It is the first plan or budget to be prepared. All other planning is based on it. Revenue planning provides the basic management decision

about marketing and help to develop comprehensive revenue plan. If the revenue plan is not realistic, most of all other part of overall profit plan is also not realistic. Revenues of the organization should managed in such a way by which it will increase continuously.

Nepal electricity Authority is the key player in Nepal's power sector. Electricity service is very essential to every people. NEA is not able to meet the demand of customers. Nepal Electricity Authority is suffering form loss since many years. Revenue of electricity authority is sales of electricity. Sales plan of electricity is very essential for it's performance improvement. Sales plan is prepared by NEA according to the nature of customers. NEA has categorized its customer in various types and charges the price based on that category. Sales revenue of NEA has been presented in table for five years from fiscal year 2061/62 to 2065/66.

**Table No. 4.1**  
**Sales Revenue**

(Rs. in Million)

Year	Actual sales in Rs.	Rs. change	% change
2060/61	11874.70	-	-
2061/62	12605.20	730.5	6.15
2062/63	13331.90	726.7	5.77
2063/64	14449.73	1117.83	8.38
2064/65	15041.49	591.76	4.09
2065/66	15220.87	179.38	1.19

Source: A Year in Review, FY 2065/66 (NEA)

The above table no. 4.1 shows the sales revenues of the NEA for five years from FY 2061/62 to 2065/66. Sales revenue of NEA is increasing in fluctuating trend. In year 2063/64 sales revenue is increased by 8.38%.

But in 2065/66 sales revenue is marginally increased by 1.19%. It is lesser in prior year comparison. Being monopolist in power sector, NEA has not entertaining satisfactory revenue. This is due to mainly by low production and power loss in transmission and distribution system.

**Table No. 4.2**  
**Sales in Unit (GWH)**

Year	Sales unit	Change unit	% change
2060/61	1795.23	-	-
2061/62	1964.39	169.16	9.42
2062/63	2032.62	68.23	3.47
2063/64	2204.20	171.58	8.44
2064/65	2310.32	106.12	4.81
2065/66	2308.91	-1.41	-0.06

Source: A Year in Review, FY 2065/66 (NEA)

The above table 4.2 exhibits the sales units for the fiscal year 2061/62 to 2065/66. Sales revenue directly related to sales unit. Higher the sales unit higher will be the sales revenue. Till FY 2064/05 sales units are in increasing trend, however, the percentages of increase is fluctuating, in FY 2065/66, NEA experienced a negative sales growth. There is huge demand of electricity in the country. In FY 2065/66, there is negative growth in sales units, which is created by low production rather than low demand. So, NEA should give emphasis to increase the production units and decrease the power loss.

The presentation of the above sales revenue of NEA will be move effective by following graph.

**Graph No. 4.1**  
**Sales Revenue**

To analyze the trend of actual sales of the company least square method can be used to forecast possible future sales for given time or year.

**Table No. 4.3**  
**Time Series Analysis**

Year	Income 'Y'	Time 'X'	X <sup>2</sup>	XY
2061/62	12605.20	1	1	12605.20
2062/63	13331.90	2	4	26663.8
2063/64	14449.73	3	9	43349.19
2064/65	15014.49	4	16	60165.96
2065/66	15220.87	5	25	76104.35
n=5	Y=70649.19	X=15	X <sup>2</sup> =55	XY=218888.5

Straight line trend of actual sales (Y) depends upon time(x), which is expressed as  $Y=a+bx$

Substituting the value in equation (I) and (II)

$$Y = Na + bX \dots\dots\dots(i)$$

$$XY = aX + bX^2 \dots\dots\dots(ii)$$

$$\text{Here, } 70649.19 = 5a + 15b \dots\dots\dots(iii)$$

$$218888.5 = 15a + 55b \dots\dots\dots(iv)$$

$$\text{Now, } a = 12047.56$$

$$b = 694.09$$

$$\text{Thus } Y = a + bX$$

... $Y = 12047.56 + 694.09X$  is the trend line of sales which shows the positive sales revenue in the future.

By using this trend we can estimate the actual sales for the 2066/67.

$$Y = 12047.56 + 694.09 \times 6$$

$$= 12047.56 + 4164.54$$

$$= 16212.1 \text{ Million}$$

Therefore if the trend does not change, possible sales of NEA for the year 2066/67 will be RS. 16212/1 million.

The above sales trend will be more effective by following graphical presentation.

**Graph No. 4.2**  
**Presentation of Sales Trend**

**4.2 Comparison between Budgeted Sales and Actual Sales**

To forecast the future sales, the past sales need to be considered by making future production in a correct manner. For this the company needs to closely monitor the past sales and its budgeted sales. The following table presents the budgeted and actual revenue and any deviations during the fiscal year 2061/62 to 2065/66.

**Table No. 4.4**  
**Budget and Actual Sales Revenue**

(Rs. in Million)

Fiscal Year	Budgeted Revenue	Actual Revenue	Deviations
2061/62	13017.92	12605.20	3.17%(U)
2062/63	13940.83	13331.90	4.37%(U)
2063/64	15315.62	14449.73	5.65%(U)
2064/65	15890.94	15041.49	5.34%(U)
2065/66	17533.66	15220.87	13.19%(U)

The above table shows that there is acceptable level of deviations between budgeted and actual revenue recording not more than 10% during the FY 2061/62 to 2064/65. But in the fiscal year 2065/66 there is unacceptable level of deviations. So it can be said that there is a great lack of effective sales plan for sales budget.

### **4.3 Cost Plan of Nepal Electricity Authority**

Cost planning and controlling should not focus only on decreasing the future costs or expenses but also need to focus on efficient and better utilization of limited resources. It should also focus the relationship between costs and benefits derived from those costs organization has to bear various types of costs, like variable cost, fixed cost or semi variable cost. Variable cost can be controlled, so it is also called controllable cost. But fixed cost cannot be controlled, so it is called uncontrollable cost. For operation of business cost is required but it should control to earn profit. For the cost volume profit analysis cost should be segregated. Variable cost and fixed cost is very much necessary to find for CVP analysis. Every organization has to determine the level of BEP to protect the business. Break-even point is the level of activity where the total cost equal to total sales. NEA did not practiced CVP analysis, therefore NEA does not have segregated the cost into fixed and variable.

Following are the category of cost incurred in NEA

- ) Generation cost
- ) Transmission cost
- ) Distribution expenses
- ) Royalty
- ) Power purchase cost
- ) Administrative expenses

- ) Interest
- ) Depreciation
- ) Deferred revenue expenditure written off

#### 4.3.1 Fixed Cost Analysis

The fixed cost remain unchanged in total despite the changes in output level within a year, the fixed cost on per unit basis decreases as the level of activity increases and vice versa. Fixed cost in total may vary for different fiscal year. The fixed costs presented here are based on guidance of thesis supervisor, NEA manager's suggestion and nature of cost, because costs are not segregated in this organization. The fixed cost are presented in table below.

**Table No. 4.5**  
**Fixed Cost Sheet**

(Rs. in Million)

Particulars	Fiscal Year				
	2061/62	2062/63	2063/64	2064/65	2065/66
Generation cost	193	243	257	294	337
Transmission cost	65	70	72	82	96
Distribution expenses	445	511	550	633	731
Royalty	591	629	679	587	568
Administrative expenses	187	126	144	205	219
Interest	3080	3051	2385	2274	2809
Depreciation	1733	1817	1856	1895	2231
Deferred revenue expenditure written off	123	105	43	108	110
Total fixed cost	6417	6552	5986	6078	7101
Change %	-	2.10	-8.64	1.54	16.83



In the above table 4.5, the total fixed cost are in increasing trend in the fiscal year 2062/63, 2064/65 and 2065/66 but the fixed cost is decreasing position in the FY 2063/64. The fixed cost is decreased by 8.64% in this year. The total fixed cost of NEA is very high because of high amount of interest on long term loan and depreciation. High fixed cost increase the break-even level. The fluctuation is made by various factors like different level of output, changes in the rate of different items every year, proportion of cost distribution etc.

#### 4.3.2 Variable Cost Analysis

Variable costs are those cost which varies in direct proportion to change in level of activity or output but per unit variable cost is constant. The variable cost presented here are based on the guidance of thesis supervisor, NEA manager's suggestion and nature of cost. The variable cost are presented as follows:

**Table No. 4.6**  
**Variable Cost Sheet**

(Rs. in Million)

Particulars	Fiscal Year				
	2061/62	2062/63	2063/64	2064/65	2065/66
Generation cost	449	568	599	686	785
Transmission cost	151	162	169	193	223
Distribution expenses	1039	1193	1284	1477	1706
Royalty	253	269	291	251	244
Power purchase	5760	6392	6968	7437	8423
Administrative expenses	435	294	336	479	511
Total variable cost	8087	8878	9647	10523	11892
Change Percentage	-	9.78%	8.66%	9.08%	13.01%

Above table no. 4.6 shows the variable cost is in increasing manner, variable cost is increased by 9.78% in year 2062/63 and reached the amount Rs. 8878 million .In FY 2063/64 and FY 2064/65 the variable cost is increased by 8.66% and 9.08% respectively. In year 2065/66 the variable cost is increased by 13.01% and reached the amount Rs. 11892 million. The fluctuation is made by various factors such as different level of output, different rate in each year etc.

### 4.3.3 Semi-Variable Cost Analysis

Costs containing both the element of fixed and variable are considered as semi-variable cost. These cost are neither remain constant nor change proportionately as per change in production unit. According to their nature the semi-variable cost are shown below.

**Table No. 4.7**  
**Semi-variable Cost Sheet**

(Rs. in Million)

Particulars	Fiscal Year				
	2061/62	2062/63	2063/64	2064/65	2065/66
Generation cost	642	811	856	980	1122
Transmission cost	216	232	241	275	319
Distribution expenses	1484	1704	1834	2110	2437
Royalty	844	898	970	893	812
Administrative expenses	622	420	480	684	730
Total variable cost	3808	4065	4381	4888	5420
Change Percentage	-	6.75%	7.77%	11.57%	10.88%

Above table 4.7, semi-variable generation cost, transmission cost, distribution expenses and administrative expenses are segregated by 70% of variable cost and 30% of fixed cost in proportion. On the other hand, royalty is segregated by 30% of variable cost and 70% of fixed cost in proportion. All the segregated semi-variable costs are included in above fixed cost sheet and variable cost sheet. All the semi-variable cost is classified into fixed and variable proportion using 'Degree of Variability Method'. The degree of variability is determined by the suggestion and intuition of the guide and senior staff of the organization. Total semi-variable cost is in increasing trend, Total semi variable cost is Rs. 3808 million in year 2061/62 and increased by 6.75% in this amount and reached to Rs. 4065 millions in year 2062/63. NEA's total semi-variable cost in year 2065/66 is Rs. 5420 million which is increased by 10.88% on previous year figure.

#### **4.4 Cost-Volume-Profit Analysis of Nepal Electricity Authority**

The cost-volume-profit analysis is the process of studying relationship between cost, volume and profit. CVP analysis is a powerful tool in managerial decision-making, CVP analysis especially helps in cost control, cost reduction and profit maximization. We have to compute various ratios in cost volume profit analysis, which are contribution margin, profit-volume ratio, break-even analysis and margin of safety.

**Table No. 4.8**  
**Computation of Various Ratios of NEA**

(Rs. in Million)

S.N.	Particulars	Fiscal Year				
		2061/62	2062/63	2063/64	2064/65	2065/66
1	Sales revenue	12605	13332	14450	15041	15221
2	Variable cost	8087	8878	9647	10523	11892
3	Contribution margin	4518	4454	4803	4518	3329
4	P/V ratio (CM/Sales)	0.36	0.33	0.33	0.30	0.22
5	Fixed cost	6417	6552	5986	6078	7101
6	BEP (Fixed cost/PV ratio)	17825	19855	18139	20260	32277
7	% BEP on sales	141.41	148.92	125.53	134.69	212.06
8	Margin of Safety (AS-BES)	(5220)	(6523)	(3689)	(5219)	(17056)
BEP (Rs) considering other income and expenses						
9	Other income	618	640	1017	935	992
10	FC after deducting other income (5-9)	5799	5912	4969	5143	6109
11	BEP (Rs.) (10/PV ratio)	16108	17915	15058	17143	27769
12	Margin of safety (1-10)	(3503)	(4583)	(608)	(2102)	(12547)

#### 4.4.1 Contribution Margin

The difference between selling price and variable cost is known as contribution margin. In other words, fixed cost plus the amount of point is equivalent to contribution margin. It is particularly useful in determining the break-even point and target profit. It can be expressed as:

Contribution margin= Sales revenue-Variable cost

CM for the base year 2061/62= Rs. 12605 million- Rs. 8087 million  
= Rs. 4518 million.

The above table no. 4.8 shows that the calculation of contribution margin of NEA during the FY 2061/62 to 2065/66. Contribution margin of NEA is decreasing in fluctuating trend expect FY 2063/64 contribution margin of NEA is not satisfactory. Contribution margin for the FY 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 are Rs. 4518 million, Rs. 4454 million, Rs. 4803 million, Rs. 4518 million and Rs. 3329 million respectively. High contribution margin shows positive signal for high profit and low contribution margin leads to no profit or loss situation.

#### **4.4.2 Profit-Volume Ratio**

It is an important tool in studying the profitability of a business. It establishes a relationship between the contribution margin and sales volume. The two factor profit and volume are interconnected and dependent with each other. Profit depends upon sales, sales price to a great extent depends upon the volume of production. It can be determined by using the following formula.

$$\text{Profit volume ratio} = \frac{\text{Contribution Margin}}{\text{Sales}}$$

$$\text{'P/V ratio' for the base year 2061/62} = \frac{\text{Rs. 518 millions}}{\text{Rs. 12605 millions}}$$

$$= 0.36$$

From above calculation we figured out the profit volume ratio for the base year 2061/62 is 0.36. Similarly, through table no. 4.8 during FY 2061/62 to 2065/66. The PV ratio for the FY 2062/63, 2063/64, 2064/65 is 0.33, 0.33, 0.30 and 0.22 respectively. The figure shows the PV ratio in

decreasing trend. To increase the PV ratio the company always tries to reduce variable cost. Increase in contribution margin will increase in profit because fixed cost are assumed to be constant at all levels of production in the year.

#### 4.4.3 Break-even Point

Break-even analysis is that part of CVP analysis which tells about the level of sales at which revenues equal expenses thus showing a zero net income more precisely; such a sales points is called the Break-Even Point. Through contribution margin approach break-even point can be expressed as:

$$\text{BEP in amount} = \frac{\text{Net Fixed Cost}}{\text{P/V Ratio}}$$

$$\begin{aligned} \text{BEP for the base year 2061/62} &= \frac{\text{Rs. 6417 million}}{0.36} \\ &= \text{Rs. 17825 million} \end{aligned}$$

Therefore, the break-even point for the base year 2061/62 is Rs. 17825 million. The above table no. 4.8 shows the Rs. 17825 million Rs. 19855 million, Rs. 18139 million, Rs. 20260 million and Rs. 32277 million for the FY 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. Break-even sales is higher than actual sales NEA is suffering from loss continuously. To achieve profit, actual sales revenue needs to exceed the break even point of respective fiscal years.

The BEP can be determined through another approach known as graphical approach. Graphical presentation of BEP (Rs.) for the FY 2061/62 is shown below.

**Graph No. 4.3**  
**Break-even Sales**

Here,

Fixed cost= Rs. 6417 million

Variable cost= Rs. 8087 million

Total cost= Rs. 14504 million

Sales = Rs. 12605 million

BEP sales = Rs. 17825 million

Loss= Rs. 1899 million

In the above graph, sales revenue is shown as 'X'-axis and cost amount is shown as 'Y' axis. Graphs shows the sales, cost and break even level of NEA. Total cost curve is in increasing trend as increase in sales value. But fixed curve is parallel to x-axis. Total cost curve starts from fixed cost Rs. 6417 million. When sales revenue is zero, fixed cost is equal to total cost i.e. Rs. 6417 million. Sales revenue curve originate from the origin because when there is no sales volume there is no sales revenue. As the sales volume starts taking size sales revenue starts increasing. The

equilibrium point of total cost curve and total revenue curve is known as break even point i.e. Rs. 17825 million. NEA is not generating profit and suffering from loss because actual sales is lower than break even sales.

#### **4.4.4 Margin of Safety**

Margin of safety is the different between the actual sales revenue and the break even sales revenue. It is the position above the break even point. Margin of safety can be expressed as:

Margin of safety= Actual sales-Break even sales

'MOS' for the base year 2061/62= Rs. 12605 million -17825 million  
= Rs. (5220 million)

The above computation shows that the margin of safety for the base year 2061/62 is Rs. (5220 million). Table no. 8 shows the negative margin of safety during the FY 2061/62 to 2065/66. The amount of margin of safety are Rs. (5220 millions), Rs. (6523 million), Rs. (3689 million), Rs. (5219 million) and Rs. (17056 million), for the FY 2061/62, 2062/63, 2063/64, 2064/65 and 2065/66 respectively. After considering other income and expenses MOS is also negative. For better profitability situation positive margin of safety is required. Such situation is not fruitful to the company.

#### **4.5 Sensitivity Analysis: Assess the Impact of the Changes in Cost Volume Profit Variables**

Sensitivity analysis is the measurement of elasticity of the change in cost-volume-profit factors on break-even point or given profit. It is another popular technique of testing the cost volume profit variables. Profit is the main function among the variety of factors, CVP factors can be affected by change in volume, cost and prices, profit may be affected by the



change in price, volume, variable cost, fixed cost and combinations of factors, which shows proportionate relationship, positive relationship, inverse relationship and no relationship.

#### 4.5.1 Effect of Changes in Sales Value

Any positive changes in sales revenue will lead to increase in PV ratio, lowering the BEP and finally increasing profit. On the other hand if any negative change appears in sales revenue, it results decrease in P/V ratio, increases BEP and decreases profit. To see the effect of change in sales value, we increase and decrease sales revenue of FY 2065/66 by 10% making other things constant. We get the following result.

**Table No. 4.9**  
**Income Statement with 10% Changes in Sales Revenue**  
**for the Fiscal Year 2065/66**

(Rs. in Millions)

Particulars	Changes of Sales Revenue		
	Original	10% increase	10% decrease
Sales revenue	15221	16743	13699
Less variable cost	11892	11892	11892
Contribution margin	3329	4851	1807
Less: Fixed cost	7109	7101	7101
Profit/loss	(3772)	(2250)	(5294)
Change in profit/loss	-	1522	(1522)
P/V ratio	0.22	0.29	0.13
BEP in Rs.	32,777	24486	54623
% change in BEP	-	(24.14)	69.23

Above table shows that when sales revenue of NEA is increased by 10%. Net loss is reduced by Rs. 1522 million and PV ratio is increased to 0.29 from 0.22. When sales revenue is increased by 10% break even sales is reduced by 10% break even sales is reduced to Rs. 24,486 million from Rs. 32,277 million. The break even sales decreased by 24.14%, when sales revenue is decrease by 10% net loss is increased by Rs. 1522 million. PV ratio is reduced to 0.13 from 0.22 and the break even sales is increased to Rs. 5.4623 million from Rs. 32,277 million. The break even sales is increased by 69.23%

#### 4.5.2 Effect of Changes in Variable Cost

When the variable cost is changed without changing the sales revenue and fixed cost, we can find the change result in PV ratio, profit and BEP. Chain effect appears with any change in variable cost towards profit, if variable cost is lowered, then, PV ratio will increase, BEP will lower and profit rises. But if variable cost is increased, then it will lower PV ratio, increases BEP and finally reduces profit. To see the effect of change in variable cost, we increase and decrease variable cost of FY 2065/66 by 10% making other things constant. We get the following result.

**Table No. 4.10**  
**Income Statement with 10% Changes in Variable Cost**  
**For the Fiscal Year 2065/66**

(Rs. in Millions)

Particulars	Changes of Sales Revenue		
	Original	10% increase	10% decrease
Sales	15221	15221	15221
Less variable cost	11892	13081	10703
Contribution margin	3329	2140	4518
Less: Fixed cost	7101	7101	7101
Profit/loss	(3772)	(4361)	(2583)
Change in profit/loss	-	(1189)	1189
P/V ratio	0.22	0.14	0.30
BEP in Rs.	32277	50721	23670
% change in BEP	-	57.14	(26.67)

Above table 4.10 shows that variable cost of NEA is changed by 10%. When variable cost is increased by 10%, net loss of NEA is increased by Rs. 1189 million, PV ratio is decreased to 0.14 from 0.22. Break even sales is increased by 57.14% and reach to Rs. 50,721 million. When variable cost of NEA is decreased by 10%, net loss is increased by Rs. 1189 million and PV ratio is increased to 0.30. Break-even sales is reduced by 26.67% and reach to Rs. 23, 670 million.

#### 4.5.3 Effect of Changes in Fixed Cost

When fixed cost is changed it does not bring any change in contribution margin and PV ratio. But it changed net profit and BEP amount. If fixed cost rises in any special conditions like change in managerial policy, inflation and due to some external factors, the BEP will rise and profit falls. But if fixed cost falls, it will lower the BEP and raises profit. To see the effect of change in fixed cost, we increase and decrease fixed cost of FY 2065/66 by 10% making other things constant. We get the following result.

**Table No. 4.11**  
**Income Statement with 10% Changes in Fixed Cost**  
**for the Fiscal 2065/66**

(Rs. in Million)

Particulars	Changes of Sales Revenue		
	Original	10% increase	10% decrease
Sales	15221	15221	15221
Less: variable cost	11892	11892	11892
Contribution margin	3329	3329	3329
Less: Fixed cost	7101	7811	6391
Profit/loss	(3772)	(4482)	(3062)
Change in profit/loss	-	(710)	710
P/V ratio	0.22	0.22	0.22
BEP in Rs.	32277	35505	29050
% change in BEP	-	10.00	(10.00)

Above table no. 4.11 shows that changed in fixed cost does not bring any effect in contribution margin and PV ratio. But when fixed cost is increased by 10%, net loss is increased by Rs. 710 million and break even sales is increase upto Rs. 35,505 million from Rs. 32,277 million. The increase of break even sales is 10% more than original break sales. When fixed cost is decreased by 10%, net loss is decreased by Rs. 710 million. Break even sales is also decreased due to reduction in fixed cost and break even sales is become Rs. 29050 million from Rs. 32,277 million. So, we can say that there is proportionate relationship between break even point and fixed cost, where one leads to change another proportionately.

#### **4.6 Net Profit Position of NEA**

Profit is the excess amount over the total cost. Every organization requires profit. Without profit organization can not run smoothly and fail to achieve its goal. So, profit is compulsory to every organization. The table below shows the profit/loss position of NEA.

**Table No. 4.12**  
**Profit and Loss Position of NEA**

(Rs. in Million)

Fiscal Year	Profit/loss Rs	Rs. Change	% Change
2061/62	(1899)	-	-
2062/63	(2089)	(199)	10.48
2063/64	(1183)	915	(43.61)
2064/65	(1560)	(377)	31.87
2065/66	(3772)	(2212)	141.79

Above table no. 4.12 shows, NEA is suffering from loss since FY 2061/62 to 2065/66. NEA is not able to earn profit. In fiscal year 2061/62

NEA'S net loss is Rs. 1899 million. In FY 2062/63, net loss is increased by 10.48% and the net loss is Rs. 2098 million. It is able to decreased net loss in FY 2063/64 by 43.61% and also suffered from loss. Net loss of FY 2063/64 is Rs. 1183 million. In Fy 2064/65, it has Rs. 1560 million loss which is 31.87% more than FY 2063/64. In FY 2065/66, net loss is Rs 3772 million which is 141.79% more than FY 2064/65. In this fiscal year NEA has bear very high amount of loss than previous year.

To find out the correlation between actual sales revenue and profit or loss, the Karl Pearson's coefficient of correlation denoted by 'r' is used, correlation of co-efficient analyzes the degree and the direction of relationship between actual sales revenue and profit or loss. Negative correlation shows the variable are moving in opposite direction i.e. if the value of one variable increase, then the value of other variable decreases and vice versa. There should be negative relationship between actual sales revenue and profit or loss because the value of r is 0.30. (Taken from Appendix-II)

The probable error (P.E) of the correlation coefficient (r) is the basis of interpretation of the value of 'r'. In other words the significance of 'r' is tested with probable error of 'r'. Here the value of r is less than  $6 \times P.E$  (i.e.  $-0.30 < 1.62$ ) (Taken from Appendix II). It means the value of r is highly insignificant. So, it can be said that the profit will not follow the trend of actual sales revenue.

To find out the correlation between total cost and profit or loss, the Karl Pearson's coefficient of correlation is used. There should be negative relationship between total cost and profit or loss because the value of r is -0.78. (Taken from Appendix III) Here the value of r is less than  $6 \times P.E$ . (i.e.  $-0.78 < 0.72$ ) (Taken from Appendix III). It means the value of r is

highly insignificant. So, it can be said that profit will not follow the trend of the total cost.

#### **4.7 Major Findings**

Research work is done to find something new, based on the objective of the study. The major findings on the basis of various types of analysis are as follows:

- ) NEA's sales revenue is increasing in fluctuating trend. Sales revenue of NEA is not sufficient to cover the cost. Forecasted sales of NEA is in increasing level. NEA's actual revenue is lower than budgeted revenue.
- ) NEA has not segregated cost into fixed and variable. There was no practice of identifying semi-variable cost and their segregation into fixed and variable cost. CVP analysis is not practicing by NEA.
- ) Variable cost of NEA is more than its fixed cost in total cost structure.
- ) NEA fixed cost like interest and depreciation high. Long term loan of NEA are the main cause to increase interest.
- ) NEA has no effective plan and technique to reduce costs. Goals and objectives of NEA are not clearly communicated to all levels of management.
- ) NEA has less PV ratio and more BEP sales, as a result NEA is suffering from loss.

- ) Margin of safety in NEA is negative because break even sales is higher than actual sales. There is no safety margin in NEA.
- ) NEA's contribution margin is not able to meet its fixed cost, so, NEA is not earning any profit.
- ) NEA has various projects but not completed in specified time and cost of production are increased.
- ) Sensitivity test shows that the changes in various factors cause the increase and decrease in PV ratio, BEP, margin of safety etc.
- ) Correlation coefficient shows negative relationship between actual sales revenue and profit or loss. There is also negative relationship between total cost and profit or loss.
- ) NEA is not able to earn profit. Percentage of loss is very high. NEA has profit from operation but high amount of interest and depreciation creating loss.

## CHAPTER V

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Summary

Management can effectively achieves organizational objectives through efficient use of scarce and limited resources in a changing environment of business. Future is uncertain which creates risk and to avoid or reduce risk proper management is very essential. Cost volume profit analysis is an analytical technique for studying the relationship between cost, volume and profit which helps to manage future profit and cost. CVP analysis is a technique used to determine the usefulness of profit planning process of the organization. In fact, the entire field of profit planning is associated with the CVP relationship, without CVP analysis determination of profit planning and controlling processes are almost impossible or useless.

The main objective of the present study is to examine CVP analysis as a tool to measure effectiveness of profit planning of NEA. So, this study was undertaken to cost volume profit analysis to plan the profit. As per the objectives of the study, the secondary data were used and related other information were collected through informal interviews. The collected data were analyzed with analytical and descriptive approach for sales revenue analysis, cost analysis, PV ratio analysis, Break even analysis, sensitivity analysis and profitability analysis etc.

Above CVP analysis shows that the company has low contribution margin, low P/V ratio, high BEP and negative margin of safety. The sensitivity test of CVP analysis shows that if variable and fixed cost increases, the break even point will also increases and if they were



decreased then, the break even point also decreases. But at the of increase in sales price the break even point will decrease. It indicates that the relationship between cost and break-even point is positively correlated. Where as relationship between sales price and break even point is negatively correlated. Organization have bearing loss due to failure in controlling excessive expenses. Relationship between actual sales revenue with profit or loss is negatively correlated. Correlation between total cost with profit or loss is also negative. Company's condition is very poor and requires positive action to improve its position. Lack of detail information on scientific cost analysis and extra cost burden and loss of the company are the main reason behind not practicing profit planning and control tools like CVP analysis.

## **5.2 Conclusion**

Different types of profit planning tools, which are used in the academic field and in multinational companies of developed nation are not applied by NEA. NEA has not segregating cost into fixed and variable. Segregation of cost into fixed and variable is the fundamentals of CVP analysis. The company did not adopt the cost control programme. The accumulation and apportion of cost on the basis of cost center is not done by the company. Therefore, NEA has not been able to use CVP analysis.

Sales revenue of NEA is increasing in fluctuating trend. NEA is not producing sufficient electricity. Profit pattern of the company shows that the company is ineffective in the profit planning. The cost structure of NEA discloses variable cost and fixed cost which indicates the risk due to high variable cost and high amount of interest CVP analysis shows that the contribution margin did not cover the fixed cost. BEP of the company is greater than actual sales due to low PV ratio. The business of the

company is in high operating risk due to higher break-even sales. The analysis of cost behaviour facilitates the use of another CVP technique called as sensitivity analysis which support the decision making. The change in variable cost, fixed cost or sales price has certain impact on BEP. There is direct relationship between fixed cost and BEP.

The plans are prepared from top level and later it is communicated to the lower level. There is lack of authorities to formulate various plans in lower level management. Company has not analyzed its strengths and weaknesses. NEA has not able to utilized its capacity in optimum level, very high cost on large projects are another problem of NEA. Most of the public enterprises created financial burden to the government. To run NEA properly controlling of cost and participative management are essential. To strengthen the positive and to carry out PPC activities, the company should use the CVP analysis.

### **5.3 Recommendations**

On the basis of above study, the following recommendation seems to be fruitful to the management of NEA.

- ) NEA has not practiced CVP analysis. So it is suggested that NEA should practice CVP analysis and cost volume profit relationship should be considered while formulating profit plan.
- ) Classification of cost into variable and fixed as well as controllable and non-controllable must be made within specific framework of responsibility center and time.
- ) Cost plan of NEA are not systematically maintained. Separate cost control department need to be established to control cost.

- ) Cost planning and controlling should focus on the relationship between cost and benefits rather than incurring cost in order to heighten revenue.
- ) Sales revenue of NEA is in increasing trend but it is not sufficient to cover the cost and earn profit.
- ) Company need to restructure its capital structure as huge amount is paid as interest on long term loan every year. Such burden could be minimized through internal financing.
- ) Price rising is not only one alternative to increase sales revenue controlling is necessary to decrease the wasteful expenses. NEA should adopt the controlling tools.
- ) CVP analysis and PPC manuals should be communicated from top to lower levels. All personnel should be participated on decision making and planning process.
- ) All decision makers should be fully aware and understand the cost structure of their operation, otherwise CVP analysis will provide meaningless information.
- ) Systematic and periodicals performance reports should be strictly followed to trace poor performance and take corrective action immediately and timely.
- ) NEA should reduce variable cost and fixed cost as well as increase sales revenue to generate profit. This also helps in reducing break-even sales.

- ) Financial state of the company is in decreasing stage and it should implement new and effective marketing strategies to improve the company.
- ) NEA should try to reduce the volume of popular purchases and replacement should be made by its capacity utilization, ultimately it helps to increase profit.
- ) It is suggested that NEA should try to avoid the load shedding and gain peoples faith.
- ) NEA should invest financial resources efficiently, NEA should consider cost-benefit ratio in selection of project.

## BIBLIOGRAPHY

- Agrawal, G. R. (2004). *Dynamics of Business Environment in Nepal*, Kathmandu: M.K. Publishers and Distributors.
- Anthony, R.N. and Welseh G A (1977). *Fundamentals of Management Accounting*, Illinois: Richard D. Irwin Homewood.
- Bajracharya, P., Ojha, K.P., Goet, J. and Sharma, S. (2004). *Managerial Accounting in Nepalese Perspective*, Kathmandu: Asmita Books Publisher and Distributors Pvt. Ltd.
- Brown, J.L. and Howard. I.R. (1969). *Principles and Practice of Management Accounting*, London: McDonald's and Evans Limited.
- Chadwick, Leslie (1996). *The Essence of Management Accounting*, New Delhi: The Prentice Hall of India.
- Dangol, R.M. and Prajapati. K., (2001). *Accounting for Financial Analysis and Planning*, Kathmandu: Taleju Prakashan.
- Drury, Colin, (2000). *Management and Cost Accounting*, UK: Business Press Thomson Learning.
- Fago, G. (2003). *Profit Planning and Control*, Kathmandu: Buddha Academic Enterprises Private Limited.
- Garrison, R. H. (1985). *Managerial Accounting*, New York: John Wiley and Sons.
- Goyal, S.N. and Mohan, M. (1997). *Management Accounting*, Arga: Shahitya Bhawan Publication.
- Gupta, S.C. (1997). *Advanced Accounts*, New Delhi: S. Chand and Company.
- Gupta, S.P. (1992). *Management Accounting*, Arga: Shahitya Bhawan Publication.
- Hilton, R. W. (1997). *Managerial Accounting*, USA: McGraw-Hill Company Inc.

- Horngreen. C.T., Foster G. and Datar, S.M. (1999). *Cost Accounting a Managerial Approach*, New Delhi: Prentice Hall of India Pvt. Ltd.
- Jain, S. P. and Narang, K. L. (1992). *Cost Accounting Principles and Practice*, New Delhi: Kalyani Publishers.
- Jain, S.P. and Narang, K.L. (1993). *Advanced Accounting*, New Delhi: Kalyani Publishers.
- Joshi, S. (1999). *Public Enterprises Management*. Kathmandu: Taleju Prakashan.
- Kaplan, R. S. and Atkinson, A. A. (1998). *Advanced Management Accounting*, New Delhi: Printice Hall International.
- Khan. M.Y. and Jain, P.K. (1993). *Management Accounting*, New Delhi: Tata McGraw-Hill Publishing Co.
- Koontz, H. and O'Donnel C. (1990). *Principle of Management: An Analysis of Managerial Functions*, New York: Mc-Graw Hill Book Company.
- Kothari, C.R. (1990). *Research Methodology: Methods and Techniques*, New Delhi: Willey Eastern Limited.
- Kulkarni, P.V., (1992). *Financial Management, Bombay: Himalayan Publishing House*,
- Lynch, R.M. and Williamson, R. W., (1999). *Accounting for Management*, New Delhi: Tata McGraw Hill Publishing Company Limited.
- Maheshwari, S. N. (2000). *Management Accounting and Financial Control*, New Delhi: Sultan Chand and Sons Educational Publisher.
- Munankarmi, S. P. (2003). *Management Accounting*, Kathmandu: Buddha Academic Enterprises Pvt. Ltd.
- Pandey, I. M., (1999). *Management Accounting*, New Delhi: Vikas Publishing House. Pvt. Ltd.

- Shrestha, P. (1990). *Public Enterprise Management in Nepal*, Kathmandu: Ratna Pustak Bhandar.
- Van Home, J.C. (1998). *Financial Management and Policy*, New Delhi: Prentice Hall of India Pvt. Ltd.
- Welch, G.A. (1979). *Budgeting: Profit Planning and Control*, New Delhi: Prentice Hall of India Pvt. Ltd.
- Welsch, G. A. Hilton, R.W. and Gordon, P.N. (2000). *Budgeting Profit Planning and Controlling*, New Delhi: Prentice Hall of India Pvt. Ltd.
- Wolf, H.K. and Pant, P. R. (2005). *Social Science Research and Thesis Writing*, Kathmandu: Buddha Academic Enterprises Pvt Ltd.

### **Thesis**

- Acharya, Chiranjibi, (2001). *Profit Planning in Nepalese PEs: A Case Study of NEA*, An Unpublished Master's Degree Thesis, Shanker Dev Campus, Kathmandu.
- Bhatta, Gunakar, (1998). *Profit Planning in Nepal Electricity Authority*, An Unpublished Master Level Thesis, Shanker Dev Campus, Kathmandu.
- Dahal, Rabin, (2005). *Profit and Planning System and Financial Condition of Nepal Electricity Authority*, An Unpublished Master Level Thesis, Shanker Dev Campus, Kathmandu.
- Goet, Goginder, (1991). *Revenue Planning and Management in Nepal: A Case Study of Nepal Electricity Authority*.
- Gurug, Rajendra (2008). *Cost Volume Profit Analysis: A Comparative Analysis Between Nepal Telicom and Nepal Electricity Authority*, An Unpublished Master Level Thesis, Shanker Dev Campus, Kathmandu.
- Joshi Kamal Raj, (2004). *Revenue Planning and Cash Management of NEA*, An Unpublished Master Level Thesis, Shanker Dev Campus,

Kathmandu.

Namdak, Tenzin, (2005). *Cost Volume Profit Analysis of DDC*, An Unpublished Master Level Thesis, Shanker Dev Campus, Kathmandu.

Ojha, Khagendra Prasad, (1995). *Profit Planning in Manufacturing Public Enterprises; A Case Study of Royal Drugs Limited and Herbal Production and Processing Company Limited*.

Rijal, Madhav, (2005). *CVP Analysis as a Tools to Measure Effectiveness of PPC: A Case Study of NEBICO Private Limited*,

Sharma, Sagar (2002). *Management Accounting Practices in the Listed Companies of Nepal*.

Uprety, Dinesh Kumar, (1998). *An Analysis of Profitability Performance of NEA*,

**Report**

*Nepal Electricity Authority, Annual Report (2005-2009)*.

**Website**

[www.nea.org.np](http://www.nea.org.np)