

# Chapter I

## Introduction

### 1.1 Background

Industrialization is an effective means of achieving economic development. It is the major hope, which can raise the living standards and provide better quality of life in the country. In the absence of industrialization, Nepalese problems like poverty, insecurity and overpopulation cannot be solved. The central problem of economic development of the backward countries is industrialization. It is one of the major tools with the aid of which the vicious circle of backward and poverty can be broken. And it is also major instrument of progress, modernization and social change in developing countries. In this way, the industrial sectors become an important sector for development of a country. So there is a close relationship between general economic development and the development of industries.

Although, there are diverse views regarding the characteristics and mechanism of the process of industrializations. There is unanimity of through regarding its contribution to the economic well being of the people. The path to industrial development may differ but the objective is analogous, namely, to transform society economically and socially. Whether a country choose mini conglomerate industrialization or the wage goods dominated industrial development path or the heavy industry spearheaded route, hardly matters much so long as the country attains higher levels of economic development.

Like most other developing countries, one of the important aspirations of Nepal has been to bring about a structural change that would transform its agricultural economy into an industrial one. In Nepal now a days, industries are belong established every positively. But the life cycle of our industry is not so healthy. We are listening the news regarding shot down of industries. It is miserable condition for nation. The main problem of the industries in Nepal is bearing unnecessary cost. They do not have good idea about the cost sales and their targeted profit for this year or coming year. They do not know the real cost control tools. They do not have any good idea for cost volume profit and their relationship. Most of the industries in Nepal are lacking such knowledge. The major objective of any industry is to earn high profit. To meet that targeted profit, they must know how much they have to produce goods and

services or the cost of production to overcome that cost, how much should price be and that should their sales volume is. All these are possible when the manager of organization know about cost volume profit analysis.

Most of the businesses fail after a new year, sometimes months of starting because they tend to do anything for volume without thinking new its going to affect the bottom line. Cost volume profit analysis is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is the function of selling price of product demand, variables cost, fixed cost taxes, etc. the whole picture of profit planning is associated with cost volume profit interrelationship.

The key motive of business enterprise is to make and maximize profit. Profit does not happen by chance. It is to be managed. Cost volume profit analysis is a supplementary tool of planning for profit. Cost volume profit analysis is immensely helpful developing alternative strategies in sales planning and the cost estimation. This research work is associated with the analysis of cost volume profit of Gorakhkali Rubber industry limited (GIRL). A certain relationship exists between the variable like selling price, sales volume, expenses and taxes. Cost volume profit analysis is an accounting technique showing the relationship between these variables. So this research work is also relationship among the variables of GIRL.

## **1.2 Overview of Gorakhkali Rubber Industry Limited.**

The rapid construction of road network leads significant demand for automobile parts including tyres and tubes for vehicles. To fulfill the increase demand for tyres and indigenous production, Gorakhkali Rubber Industry Ltd. Was formed as a public limited company as per the company act, 2021 on Jestha 30,2041 (June, 1984) following a joined forces between two large commercial entities of Nepal namely salt trading Corporation and Nepal Oil Corporation.

The factory is situated at picturesque confluence of Marsyangdi and Daraundi River of Majua Khairani of Gorkha district. The industry is the first large scale unit established in Nepal in the interior and the rugged mountain region of the country.

The foundation stone of the factory was laid on push 25, 2043 B.S. The factory complex is spread over in an area of 30 hector of flat land. The technical know how and design for the factory was provided by the equipment supplier, M/S china national chemical construction corporation, china CNCC was also responsible for

installation and commission of the plant. The machines and equipments were imported from china under different payment agreement, which denominated in US dollars. Subsequent of devaluation, this loan has been converted to Nepali rupees and provided by a construction of local bank and financial institution.

The industry commenced trial production from Chaitra, 2048 B.S. and commercial production from Shrawan 2049 B.S. It was formally inaugurated by late His Majesty King Birendra Birabikaram shahadev on Marga 25, 2049 B.S. The factory-installed capacity is 88000 sets of tires. But industry is not operating in its total production capacity because of different problems i.e. lack of electricity supply, water supply and financial burden. It imports necessary raw material mainly from India and also from USA, Australia, Germany, Malaysia and Korea. The industry's market is India, Srilinka, Bangladesh and own nation Nepal.

The industry is mainly producing tyres, tubes, retread rubbers, retreated cement which is needed for the automobile. The industry being only one tire producing industry in the country has focused the goal of import substitute for tyres, tubes and flaps. The company is also planning to export tires to India, Bangladesh, Africa and other south Asia countries.

The products of the industry are of very quality and exportable. Presently about 55% of the total market is covered by this industry. The industry is fully devoted to expand its present market share within the country and in the south Asia as well. For this, it has already made the agreement with Modi group of India, for management, marketing and technical supports.

### 1.3 Statement of problem

The industrialization process in Nepal is developed very slowly. In spite of various all attractive policies of the government in respect of industrialization, new investment made on industrial sector is not satisfactory. The financial performance of established manufacturing industry is also not good. Cost to the industries discourages the new investment both in manufacturing and non-manufacturing sector. There may be various and different reasons for the poor performance of manufacturing industries. Such reasons should be investigated and should be taken corrective measures for the improvement of their performance.

Being a large-scale industry portion is invested from various sectors; therefore the, the successful operation of the industry is very much important. The success of the industry will not only attract the foreign investment in the country but also increase the private sector within the country. But the financial performance of the industry is not satisfactory and it is being a heavy loss every year since the time of its operation.

Now the business is being operated largely depends on how the business operation is planned. Poor performance is the outcome of poor planning, controlling and decision-making. The key motive of every business enterprise is to make and maximize profit. Profit doesn't occur automatically, it is to be managed. Cost volume profit analysis is a supplementary tool of planning for profit. CVP analysis is immensely helpful for developing alternative strategic in sale planning and cost estimation.

If the business enterprises are suffering from continuous loss then the profit plan, should be reviewed. This study is basically designed to solve the following problems by taking into account.

- ) What is the situation of CPV analysis in the company?
- ) Does the company practice the appropriate level of budgeting system?
- ) Is the company practicing CVP analysis for its profit planning?
- ) Are their any difficulties faced by the industry in the application of the CVP analysis?

#### **1.4 Objectives of the study**

The main objective of this study is to examine “cost volume profit analysis tool to measure the effectiveness of PPC of Gorakhkali rubber industry limited” to achieve the objective, the following sub objectives have been set;

- ) To examine the sales plan practice of the industry.
- ) To identify the relationship of CVP analysis and its applicability as a tool of budgeting.
- ) To explore the profitability and financial performance of GIRL.
- ) To study the risk return relationship of the company with the help of operation.
- ) To provide relevant suggestion, recommendations and practical ideas for improving the condition of GIRL.

#### **1.5 Significance of the study**

The main objective of profit plan is to forecast about the future events to overcome the risk from uncertainties. Very few studies have been made in relation to the tools of profit planning in Nepalese context and most of the studies are related to the profit planning and control of the public enterprise where CVP as one of the tools of PPC is hardly studied. This study is significance in the sense that it has treated to study the CVP analysis of the manufacturing company, which is one of the most important tools of PPC. This study further significant because it highlights the relationship of CVP as applicable tool of budgeting and it also highlights the sensitivity of cost volume profit variables. The study would be very useful for entrepreneurs, decision makers, researchers and the manager because it deals with the practice of CVP analysis of manufacturing industry which is very important part of PPC.

## **1.6 Limitation of the study**

This study covers the CVP analysis as a tool of PPC of GIRL. The limitations of this study are:

- ) The study covers the data of five years only I.e. from F/Y2059/60 to F/Y2063/64.
- ) Analysis is concentrated on managerial finance and according aspect and it doesn't cover the other areas of the enterprise.
- ) The comprehensibility and the accuracy of the study is based on the data availed from the management of GIRL and the response made by the respondent on the research questionnaire.
- ) The study is based on primary as well as secondary data i.e. questionnaire, interview financial statements collected from the company.
- ) Being a researcher as student and due to the limited time and resource constraints the study is neither comprehensive nor extensive.

## **1.7 Organization of the study**

The entire study has been organized into five main chapters as:

### **1. Introduction**

The first chapter deals with role of industrialization development in Nepal, a brief review of GIRL, statement of problem, objective of the study, limitation of the study, significance of the study and the design of the study.

### **2. Review of Literature**

The second chapter deals with conceptual framework including the fundamental concept of PPC and the tools of PPC. It also deals with the various theoretical aspects of the CVP analysis and includes the review of previous research work.

### **3. Research Methodology**

The third chapter deals with the research methodology followed to achieve the purpose of the study have been described. It consists of the research work.

#### **4. Presentation and analysis of data**

The fourth chapter deals with the data collected through the various sources that have been presented. It mainly consists of the analysis of sales plans; various cost plans, fixed cost plan and other relevant factors are analyzed from the profit and loss account, balance sheet and cash flow statement of the company. Apart from this, sensitivity analysis, risk measurement and CVP analysis with product mix also be analyzed and the findings will be summarized.

#### **5. Summary, conclusion and recommendation**

The fifth chapter, the last chapter of the study deals with the summary, conclusions and recommendations.

Besides this, bibliography, appendices are also present in this report.

## **Chapter II**

### **Review of literature**

#### **2. Conceptual Framework**

##### **2.1 Cost volume profit analysis and its use in PPC**

Cost volume profit analysis is the study of relationship between the variables: cost, activity volume and profit. What happens if a slight change occurs in volume of activity or cost or required profit is examined in this relation? It is the one of the most popular tool in PPC. PPC remains incomplete without CVP.

CVP analysis is an analytical tool for analyzing the relationship among cost, price, profit, sales and production volume. Mainly, there are three elements in CVP analysis. They are cost, sales and production volume, and profit. All these terms are interconnected and dependent on one another. For instance, profit per unit of a product depends on its selling price and cost of sales. The selling price to a greater extent will depend on the cost and depend on the volume of production. It is highly essential for the management to have the complete knowledge about the interrelationship among these. A study concerning this inter connection is undertaken through cost volume profit analysis. C-V-P analysis is extremely helpful in profit planning and control, management decision and cost control.

Before incorporating profit plans into a detailed budget, it is useful to obtain some preliminary information on the feasibility of those plans. Cost-volume-profit analysis is one way of doing this. By manipulating cost-volume-profit relationships, management can determine the sales volume corresponding to a desired profit. Management might then evaluate the feasibility of this sales volume. If the profit plans are feasible, a complete budget might be developed for this activity level. The required sales volume might be infeasible because of market conditions or because the required volume exceeds production or service capacity, in which case management must lower its profit objective or consider other ways of achieving it. Alternatively, the required sales volume might be less than management believes the firm is capable of selling, in which case management might raise its profit objective.

Cost-volume-profit (CVP) analysis is generally defined as a planning tool by which managers can evaluate the effect of a change(s) in price, volume, variable cost, or fixed costs on profit. Additionally, CVP analysis is the basis for understanding contribution margin pricing, related short-run decisions, target costing, and transfer



pricing. As one of managerial accounting's most basic analytical tools, CVP analysis is covered in all introductory managerial accounting texts.

Hence, CVP analysis examines the behavior of total revenue, cost, and profit as the output level (volume), selling price, variable costs, or fixed costs changes. CVP analysis helps managers to answer "what-if"- type questions: What if volume increases-how will profit, revenues, and/or costs be affected? What if we raise our price- what will be the effect of profit? In effect, CVP analysis is a planning tool that utilizes information about cost behavior to provide managers with an overview of the effects of short-run financial changes.

## **2.2 Concepts of costs**

In general sense, cost means, "the price paid for something." cost is the amount of resources given up in exchange for some goods or services. The resources given up are generally in terms of money or if not in terms of money, they are always expressed in monetary terms. Cost is a measurement, for the purpose of accounting, of the cash value of whatever a firm has parted with (or is liable to part with) when making an expenditure. It is the exchange price associated with business transaction at the point of recognition. Cost is the net purchase price plus all reasonable and necessary expenditures to get the asset in place and ready for use. The term 'cost' itself is without any significant meaning and, therefore, it is always advisable to use it with objective or phrase that will convey the meaning intended, such as prime, direct, indirect, fixed, variable, controllable, opportunity, imputed, sunk, differential, marginal, replacement and the like. Each such description implies a certain attribute or characteristic which is important in computing, measuring and analyzing the cost. Costs are resources sacrificed or forgone to achieve specific objectives.

Cost is the sacrifice made, usually measured by the resources given up, to achieve a particular purpose. An important issue in both managerial and financial accounting is the timing with which the costs of acquiring assets or services are recognized as expenses. An expense is defined as the costs incurred when an asset is used up or sold for the purpose of generating revenue.

A sacrifice or giving up of resources for a particular purpose, frequently measured by the monetary units that must be paid for goods and services is cost.

"Cost means economic sacrifice, measured in terms of standard monetary unit, incurred or potentially to be incurred, as a consequence of a business decision to

achieve a specific objective.” (**Committee on cost concepts and standards of American accounting association**)

Cost is “the amount of expenditure (actual or notional) incurred or attributable to given thing.” (CIMA London).

Hence, cost means cost of production which relates to the monetary expenditure of a firm on various factors of production. It is the amount of resources given up in the exchange for some goods, services or activities. It is the amount spent in producing or manufacturing the product, the amount paid for something by a dealer or other.

### **2.2.1 Cost behavior and classification**

Cost behavior analysis is the study of how specified costs respond to changes in the level of business activity. Knowledge of cost behavior helps management plan operations and decides between alternative courses of action.

Good managers must not only be able to grasp the conceptual underpinnings of cost behavior, but they must also be able to apply those concepts to real world data that do not always behave in exactly the expected manner. Cost data is impacted by complex interactions. Consider for instance the costs of operating a vehicle. Conceptually, fuel usage as a variable cost that is driven by miles. But, no doubt aware that the efficiency of fuel usage can fluctuate based on miles. Beyond that, tires wear faster at higher speeds; brakes suffer more from city driving, and on and on. Vehicle insurance is seen as a fixed cost; but portions are required (like liability coverage) and portions are not (collision coverage). Now, the point is that assessing the actual character of cost behavior can be more daunting than you might first suspect. Nevertheless, management must understand cost behavior and this sometimes take a bit of forensic accounting work. So, a good manager must learn to use information to make informed decision about which business prospects to pursue. Managerial accounting methods provide techniques for evaluating the viability and ability to grow or “scale” a business. These techniques are called cost volume profit Analysis {CVP}.

Before can begin to understand how a business is going to perform over time and with shift in volume, it is impressive to first consider the cost structure of the business. This requires drilling down into the specific types of cost that are to be

incurred, and trying to understand their unique attributes. On the basis of behavior or variability the cost can be classified into three types as:

{1} variable cost

(2) fixed cost

{3} mixed cost

### **1. Variable cost**

Variable cost will vary in direct proportion to changes in the level of an activity. For example, direct material, direct labour, sales commission, fuel cost for a trucking company, and so on; may be expected to increase with each admission units of output.

A variable cost change in total in proportion to a change in the level of activity {or cost driver}.

The activity base is the item or event that causes the incurrence of a variable cost. It is easy to think of activity base in terms of units produced, but it can be more than that. Activity can relate to labour hours worked, unite sold, customer processed, or other “cost driver”. For instance, dentist will likely use anew pair of disposal gloves for each patent seen, no matter how many teeth are being filled. Therefore, disposable gloves are variable and key on patient count. But, the material used for filling is a variable that is tried to the number of decayed teeth that are required. Some patients have none, some have one, and others have many. So, you see that each variable cost must be considered independently, and with careful attention to what activity drives the cost.

### **2. Fixed cost**

Quite the opposite of variable costs is fixed costs. Fixed costs do not fluctuate with changes in the level of activity. Assume that a company leases the manufacturing facility where the portable digital music players are assembled. Assume that rent is as 200; 000 no matter the level of production. The rent is said to be a “fixed” cost because total rent will not change as output rises and falls. It is must important for you to observe that the fixed cost per unite will decline with increase in production. This attribute of fixed costs is very important to consider in assessing the scalability of a business proposition. There is numerous type of fixed cost. Example includes

administrative type salaries, rents; property taxes, security; networking infrastructure support; and so forth.

Fixed costs remains unchanged in total as the level of activity or cost driver varies. (Ronald W. Hilton: 2003; p277)

### **3. Mixed costs**

Many costs contain both variable and fixed components. These costs are called mixed or semi variable. If you have a cell phone, you probably know more then you wiss about such items. Cell phone agreements usually provide for a monthly fee plus usage charge for excess minutes, text messages, and so forth. With a mixed cost, there is usually some fixed amount, plus variable components tied to an activity. mixed cost are harder to evaluate because they change in responses to fluctuations in volume, but the fixed cost elements means the overall change is not directly proportional to the change in activity. To simply things, just decide which type of cost {fixed and variable} is the most important for the particular items, and then classify the whole item according to the more important characteristic. For example, in a telemarketing business, if your phone call volume changes are normally grater then your line access changes, you'd classify the entire bill as variable.(Ronald W. Hilton: 2003; p287)

### **2.3 Volume**

Volume states the level of activity usually measured in terms of units or rupees value. But it is not necessary always that the volume is to be expressed in terms of sales revenue or sales revenue or production units. But it can be expressed in terms of machine hours. It states the quantity or amount of production or sells in a given period, especially in accounting period. A volume of activity of an organization concentrates one's mind towards capacity utilization. Remaining other things same an organization operating with its normal capacity ( or maximization capacity if necessary for short-run) is said to be good which can utilize its facilities optimally. Volume maximization and optimum utilization of the organizational resources is one of the challenging jobs, which is possible only when right man at right time in right place is possible. (Garrison, R.H. 1985:235)

## 2.4 Profit

Generally profit is known as the part of income of the firm. Profit is the motivating force in the business. Success of business depends on profit. Profit promises to provide satisfaction to consumer. We can simply define the word 'profit' as the primary measurement of success of management effectiveness in business enterprise. In other words, profit means the excess of total revenue over total cost of production. Usually, profits do not just happen, it can be managed.

Management think of profit as a tangible expression of the goals it has set for the firm; a measure of performance for the achievement of its health, growth and continuity of the company.

The term profit has different meaning to different people concentrated towards it from different angles. Profit is the source of income in the sense of tax collector or government. Similarly, in economic terms profit or pure profit called economic profit stated is the return over and above the opportunity cost (i.e. the income, which businessmen might expect from the second best alternative use of the resources). Basically, two concepts or theories are available in our study in regard to the term profit;

- ) Accounting profit
- ) Economic profit

## 2.5 Analysis

Analysis is the act of investigating something about the foundation and relationship between the parts that make up it. It is carried out for the improvement and betterment along with care of the product or thing necessary in present or in future. Similarly, in applied research the term analysis simple, means to the investigation upon the market or subject in hand, its core foundation or relationship in relation to socio-political, economic, legal, technological, competitive environment.

## 2.6 Cost–volume profit Analysis: a tool of profit planning and control

Cost–volume–profit (CVP) analysis examines the behaviour of total revenues, total costs and operating income as changes occur in the output level, the selling price, the variable cost per unit and or fixed costs of a product (Horngreen, Datar and Foster:2003,

Cost-volume-profit analysis is a systematic method of examining the relationship between changes in activity (i.e. output) and changes in total sales revenue, expenses and net profit. As a model of their relationships CVP analysis simplifies the real world conditions that a firm will face. Like most models, which are abstractions from reality, CVP analysis is subject to a number of underlying assumptions and limitations. Nevertheless, it is a powerful tool for decision making in certain situations (Drury: 2000, p. 175)

Most of the business fail after a few years, sometimes months, of starting because they tend to do anything for volume without thinking how it is going to affect bottom line. Cost-volume-profit analysis is a management accounting tool to show the relationship between the elements of profit planning. Profit planning is the function of the selling price of product, demand, variable costs, fixed costs, taxes etc. the whole picture of profit planning is associated with cost-volume-profit interrelationships. (Bajracharya, Ojha, Goet and Sharma: 2004, P.225).

CVP analysis is an important media through which is the management can have an insight into effects on profit on account of variation in cost and sales and take appropriate decisions. Profit planning can be done only when the management has the information about the cost of the product & the selling of the product.

The key motive of business enterprise is to make and maximize profit. Profit does not happen by chance. It is immensely helpful for developing alternative strategies in sales planning and cost estimation. CVP is an accounting technique showing the relationship between the above mentioned variables. This technique is equally important in profit making and non-profit making organization.

Cost volume profit analysis is a management accounting tool to show the relationship between the ingredients of profit planning. Profit planning is the function of selling price of the product, the variable costs and the volume to be sold. The entire scope of profit planning associated with CVP interrelationships. A wisely used technique to study CVP relationship is break even analysis. Breakeven analysis is concerned with the study of revenues and costs in relation to sales at which the firm's revenue and total costs will be exactly equal (or net income is zero). Thus the break-even-point (BEP\_ may be defined a point at which the firm's total revenues are exactly equal to total costs, yielding zero income. The 'no profit' 'no loss' is a break

even print or a point at which losses cease and profit begins (Khan & Jain, 2000 P. 320).

## **2.7 Purpose of CVP analysis**

Cost volume profit analysis helps management in a number of ways. The following purposes are served by it (Dangol: 2004)

- i. Calculation of profit resulting from a budgeted sales volume.
- ii. Calculation of sales volume to break-even.
- iii. Calculation of sales volume to produce desired profit.
- iv. Effect or changes on price, costs and profits.
- v. Determination of new break-even point for changes in cost and selling price.
- vi. Measurement of effect of changes in profit factors.
- vii. Choosing the most profitable alternatives.
- viii. Determining the optimum sales mix.
- ix. Determination of capacity and equipment selection.
- x. Long term decision on continuance of products.
- xi. Make or buy decisions on sub-assemble or part.
- xii. To contemplate the increase or decrease in profits due to the change in method of production, etc.

## **2.8 Application of CVP analysis in profit planning and control**

Cost-volume-profit analysis is an important tool for profit planning. It has been defined as a managerial tool showing the relationship among cost selling price, profit and volume of activity. CVP analysis can be applied in the following respects (Dangol: 2004, p. 125)

- a) It helps in fixation of selling price.
- b) It is helpful in cost control.
- c) It also assists the management in understanding the behaviors of cost and helps in budgetary control.
- d) It helps in determining the level of output where all the costs can be met.

- e) It assists the management in profit planning.
- f) It also assists the management in performance evaluation for the purpose of management control.
- g) It helps very much in making managerial decisions such as make or buy a part, drop or continue a department or product line, accept or reject a special order, selection of a profitable product mix etc.

## **2.9 Approaches to cost-volume-profit analysis**

The CVP relationships can be analyzed through different approaches which are:

- i. Contribution margin approach.
- ii. Formula (equation) approach.
- iii. The graphic (break even chart) approach.

### **2.9.1 Contribution Margin Approach:**

Contribution margin is the difference between the sales revenue and variable cost of production. Contribution margin consists the fixed cost and profit i.e. contribution margin is the amount that contribute the coverage of all fixed costs and to the generation of profit.

The contribution margin income statement approach to cost volume profit analysis allows the preparation of pro-forma statement from the available information. BEP and other required CVP relationships can be explained through a contribution margin statement whose philosophy is all fixed cost are period costs that should be deducted from the contribution margin of the same period only the variable costs vary proportionally to the level of output or sales.

It can be expressed as:

$$\text{Contribution} = \text{sales} - \text{variable cost}$$

Or

$$\text{Contribution margin} = \text{Fixed cost} + \text{profit}$$

Contribution margin is usually expressed as a percentage sales which is known as contribution margin ratio or profit volume ratio. That is,



$$\text{CM Ratio or PV ratio} = \frac{\text{Contribution Margin}}{\text{Sales}} = 1 - \frac{\text{Variable cost}}{\text{Selling Price}}$$

(Dangol, 2004:173)

### 2.9.2 Formula Approach:

The most popularly practiced approach to the break even point and cost volume profit analysis is the formula, also known as the equation. It is particularly because the equation provides the most general and the easiest to remember-approach uses an algebraic equation to calculate the break even point. The answers provided by solving the equation may sometimes, need to be rounded to whole numbers of units or lot sizes. The rounding of break even points is always done upward because this will provide a small profit rather than the small loss that would be shown from rounding downward (Raiborn, Barfield and Kinney: 1993 p. 305).

The calculation in the equation approach is similar to that of the contribution margin statement approach. The equation is merely a restatement of the other.

$$\text{BE sales values} = \text{FC} + \text{VC} \pm \text{profit}$$

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

<b>Contribution Margin Approach</b>	<b>Symbol or Equation</b>
Sales volume (units)	Q
Selling price per unit	P
Sales revenue (Rs.)	$Q \times P$
Less: Variable costs	$Q \times \text{VCPU}$
Contribution margin	$Q \times P - Q \times \text{VCPU}$
Less: Fixed costs	FC
Net Profit	$Q \times P - Q \times \text{VCPU} - \text{FC}$

Therefore,

$$\text{BE Sales value} = \text{FC} + \text{VC} \pm \text{profit}$$

$$\text{BE Sales Units} \times \text{SPPU} = \text{FC} + (\text{BE Sales Units} \times \text{VCPU}) \pm \text{profit}$$

### 2.9.3 The Graphic Approach to CVP Analysis:

A break even chart is used to graphically depict the relationships among revenues, variable costs, fixed costs and profit (or losses). The no profit, no loss point (the break even point) is located at the point where the total cost and total revenue lines cross. Below this point, the firm losses, and above this point, the firm earns profit (Bajracharya, Ojha, Goet & Sharma, 2004: p 231 & 232)

In the graph given below the fixed costs remain constant within the relevant range; the fixed cost curve is parallel to 'OX' axis. Variable cost slope downward from the origin to right but the slope depends on variable cost ratio. The total costs curve parallels the variable cost curve. So the angle 'O' equals the angle 'V', it is because Total Cost = total fixed costs plus total variable costs at Volume 'Q'.

$$\text{Total costs} = \text{TFC} + Q \times \text{VCPU}$$

At volume 'Q + n'

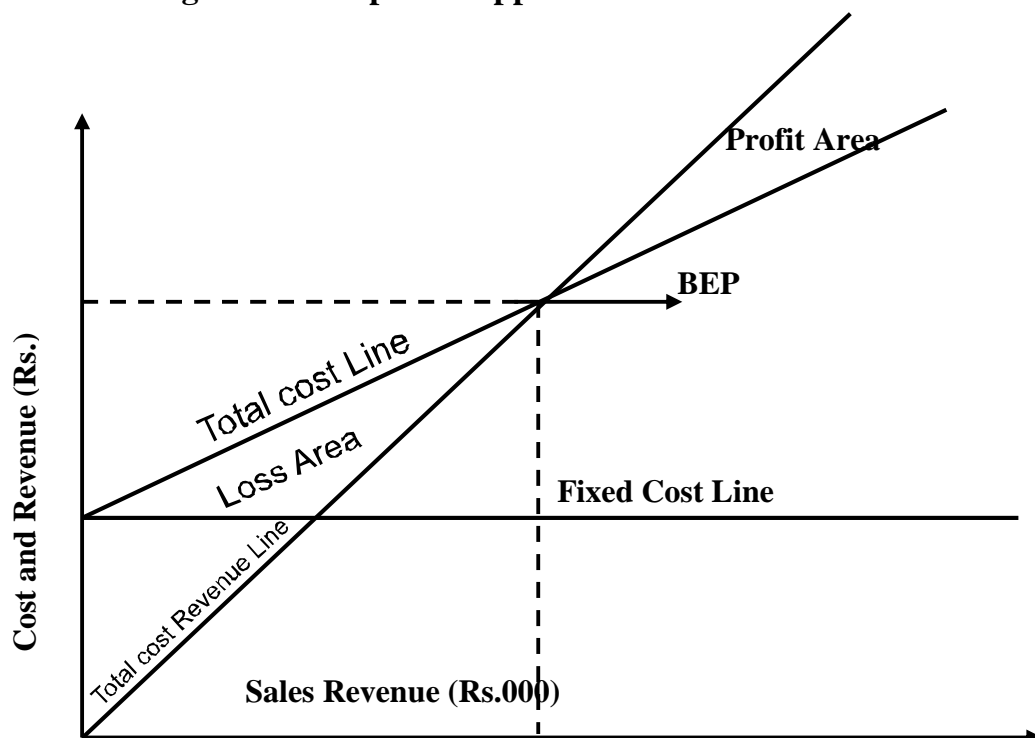
$$\text{Total Costs} = \text{TFC} + (Q + n) \times \text{VCPU}$$

$$\text{Total Costs} = O + n \times \text{VCPU}$$

$$\text{Total costs} = \text{Variables costs}$$

That's why the slope of the total cost curve equals the slope of variable cost curve.

**Figure 2.3 Graphical Approach to CVP**



The above graph clearly shows that if the company can reach the point of BEP it can generate sufficient revenues to cover all its operating expenses. At this point,

the total revenues equal the total cost. Here, the revenue curve breaks up (intersects) the total cost curve, that's why this point is called Break Even Point. In short, Break Even Point is that point where, Total Sales Revenue = Total Costs.

### **2.9.3.1 Application 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: p 182).

- ✎ Determination of the 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, make or buy decisions and drop and/or add decisions.

### **2.9.3.2 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: p. 182-p. 183):

- All cost can be classified into two parts, fixed cost and variable cost. There is no 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 remain 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 remain essentially unchanged in the sort run.

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

### **2.9.3.3 Limitations of Break-Even Analysis**

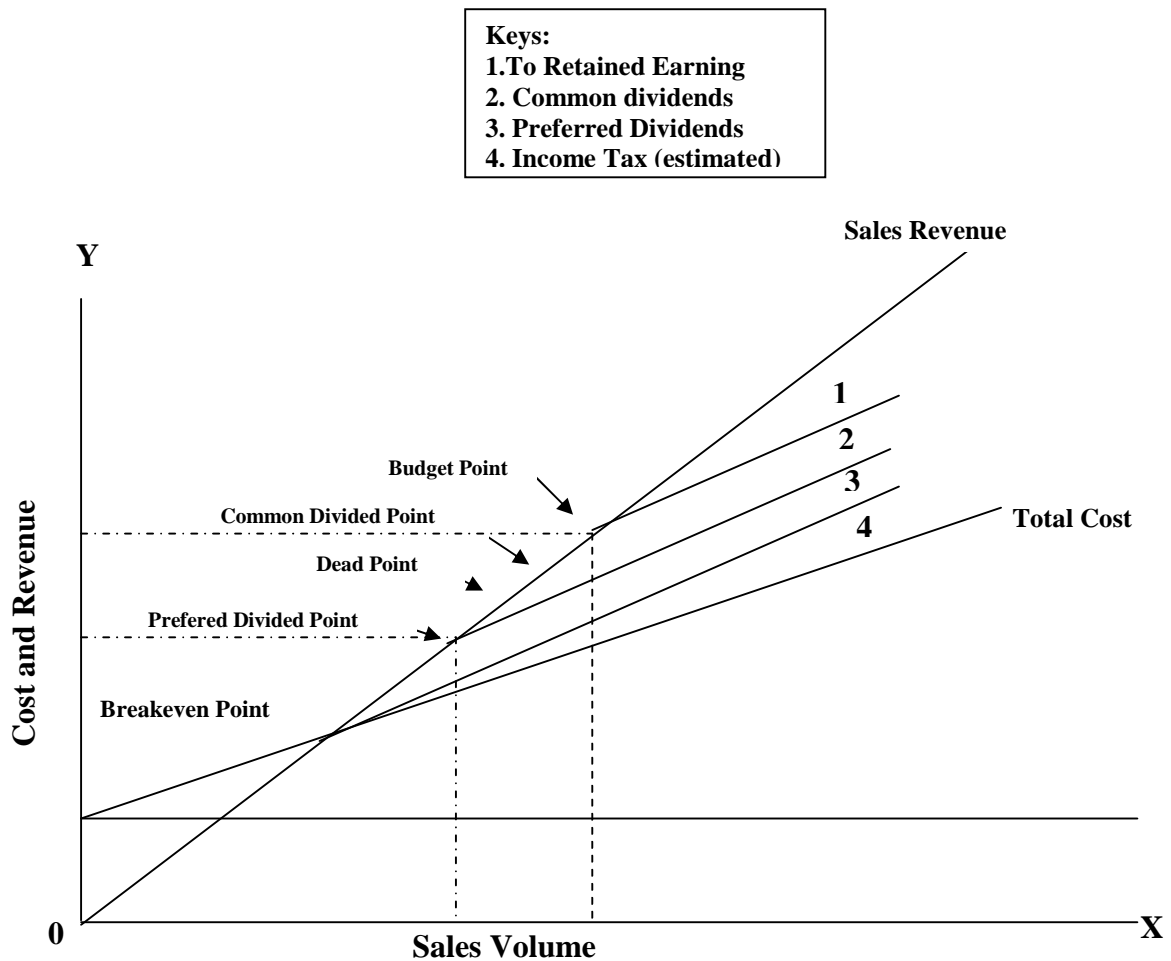
Break-even analysis in many business situations can be used for effective decision making, but there are many short comings or limitations in its analysis and interpretations. Some of these can be listed as (Maheshwari, 2000: p. 183-p. 184).

- ✎ The assumptions of producer's market phenomenon 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.
- ✎ Customers may be given certain discount on purchase to promote sales. This revenue may not be perfectly variable with level of sales output.

### **2.10 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, the arithmetical manipulations generally involve averages; hence the results should never be interpreted as precise. Rather, the analysis may be characterized approximately 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:p 467-468)

**Figure No. 2.4 Cost Volume Profit Analysis**



*Source: (Welsch, 1997: p468)*

Above break-even chart with economic characteristic indicates few of the economic characteristics of a business, which are (Welsch, 1979: p468):

- ✎ 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.

## 2.11 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 the 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 chance 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 variables costs by bringing improvement in the manufacturing process. Margin or safety can be ascertained by using the following formula (Munankarmi, 2003: 127). :

Margin of safety = (Actual Sales Value – Break even sales value)

$$= \frac{\text{Profit}}{\text{Profit – Volume Ratio}} \quad \text{in amount}$$

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

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

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

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 refusing fixed cost if possible.
- ) With reducing variable cost (with reducing the cost of raw material, wages and other direct cost).
- ) With substituting product line by more profitable one.

### **2.12 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 weighed average of the P/V ratios for the entire product, the weights being the relative proportion of each product's sales. 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: p 187)

### **2.13 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 weighed average unit contribution. This is the average of the several product unit contribution margin weighed by the relative sales proportion of each product.

Sales mix can be defined as the relative combination as of two or more products represented in total. It is not only the sales revenue that makes profit. The proportion of the sales contributed by different products generally changes the amount of profit. Managers try to achieve that combination or mix that will yield the greatest amount of profit, if a company sells more than one product, these may not be equally profitable. So the company's profit will depend upon the ratio of each product's sales to total sales revenue. Profit large promotion of total sales than if sales consist mostly of low margin item. Changes in sales can cause great variations in a company's profit. A shift to low margin can cause the total profit to decrease even though total sales increase. On the contrary, a shift in the sales mix from low margin item to high margin items can cause the reverse effect total profit may increase even though total sales decrease (Bajracharya, Ojha, and Sharma, 2004: p 260).

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

) Calculate Contribution Margin or Profit-volume Ratio for each product.

) Calculate proportion of sales mix in units or as follows:

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

) Calculated Weighed average for all products as follows:

$$\begin{aligned} \text{Weighed average} &= [\text{Sales Mix (units)} \times \text{Unit Contribution Margin}] \\ &= [\text{Sales mix (value)} \times \text{P/V ratio}] \end{aligned}$$

) Calculate Break-even Point (BEP):

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

## 2.14 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, numbers of output of its choice (desires). But in real words it is not possible, because of some critical factors like finishing machine or raw material or labour. These critical factors in the CVP analysis are known as constraint.



### **2.15 CVP analysis with a single constraint**

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's 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: p 146)

### **2.16 CVP analysis with Multiple Constraints**

Where more than one scarce resource exists, the optimum production program 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 constraints 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 of 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 p 148)

### **2.17 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: p 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.

## **2.18 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; p 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.

) 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 statistical tool.

## **2.19 Special Problems in cost- volume –profit analysis**

Cost volume- profit analyses 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;p513-518):-

### **The Activity Base**

When two or more products or activities are combined for break-even analysis, the activity base is usually in amount. Production unit is used for single product. Eh 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 is 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 desire. Management considers 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-ordinal gains and losses are non-recurring and unusual; therefore, they should be excluded. Non-operating incomes and expenses and recurring but they are not related to ongoing operations. Management considers the policy may be to ; a) include the non-operating incomes and expenses b) exclude the non-operating incomes and expenses.

### **2.20 Risk Measurement: the operating leverage**

Operating leverage Is a measures of the extent to which fixed costs are being used in organization. Te 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. Concisely, organizations that are highly capital intensive have a cost structures 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 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 factor is determined as under (Munankarmi, 2003:p145).

$$\text{Degree of operating leverage} = \frac{\text{Contribution Margin}}{\text{Net income}}$$

### 2.21 Sensitivity Analysis

Sensitivity Analysis is the measurement of elasticity of the change in cost, volume and profit factors or break even point or given profit. The strategist should focus more on the factor, which is more sensitive or responsive for profit. To measure the sensitivity of cost volume profit factors one can see the impact of certain percentage or amount change in volume, price or cost factors on net profit. In other words, sensitivity analysis is the measurement of responsiveness in outcome with the changes in determinant variable. We know that the goal of a business enterprise is to maximize profit. Profit is the excess of revenues over the total costs.

Net profit = Total sales revenues- Total costs

$$= \text{Sales units} \times \text{SPPU} - \text{Sales Units} \times \text{VCPU} - \text{Fixed Cost} - \text{Taxes}$$

So that, Profit = F (Sales volume, selling price VC, FC, Taxes etc)

Means, Profit are the function, Price, VC, PC, Taxes and so on.

But none of the factors remain unchanged sometimes the manager can intentionally change the price and cost factors as a part of strategic decisions. But the strategy should focus more on he factor, which is more sensitive or responsive for profit. Therefore, to measure the sensitivity of cost-volume-profit facto5rs, we can see the impact of certain percentage or amount change in volume, price or cost factors on net profit (Bajracharya, Ojha, Goet and Shrma: 2004: p 245).

### 2.22 Review of related studies:

There are very few research paper concerning cost-volume-profit analysis has been conducted. Most of the researches are in the area of the profit planning and control. Very few dissertations have been submitted related to cost-volume-profit analysis. Out of the previous research studies only one research is conducted to

analyze the cost volume profit of private enterprise and the study is limited by various constraints. Therefore, this study is attempted to review the previous research work on profit planning and control as well as management accounting .As CVP is one of the tools of PPC, the previous studies related to PPC are reviewed

1) Dumre, (1997) has conducted a research on the topic “Profit Planning Practice in Nepalese Public Enterprise. A case study of DDC” The study is analysis concerned with the appraisal of Dairy Development Corporation and examines that in what extent the company is applying profit planning system Mr. Dumre has covered the data of five years .In his research paper he has used both primary and secondary data by various . He has listed the following major findings.

- ) To achieve the basic objective, DDC has not clearly defined its main objective in annual goal or target.
- ) The production plan depends upon sales plan but in case of DDC the production plan is basic plan of sales plan because supply side is more important than demand.
- ) The reason of failure to raise profit in Nepalese manufacturing PEs is lack of knowledge about the market situation and lack of systematic planning. It is the situation of DDC.
- ) The commercial performance of DDC is poor, so the enterprise is not in the position to bear the financing into research and to increase plant capacity by internal fund.
- ) There is not separate costing department in DDC. Costing is done by traditional method and there is no practice of the cost as variable and fixed or controllable and non-controllable or direct and indirect etc.
- ) There is no proper planning for cost control mechanism and performance reporting.
- ) DDC has lack of budgeting experts, skilled planners and entrepreneurship Planning department has no adequate authority to decide and create new ideas to formulate various plans.

**Dumre has recommended the following points:**

- ) To improve performance of DDC, there should be systematic planning and should also hire the profit planner, because the concept of profit planning for Nepalese manufacturing PEs is very new and also necessary to earn profit for the development of enterprise.
- ) DDC should maintain proper co-ordination within the organization. Line and staff authorities and responsibilities should be clearly defined.
- ) A separate costing department should be established in DDC.
- ) DDC should consider about the product line to improve its profit. Market studies on demand, supply and pricing of milk and dairy products should be carried out.
- ) DDC should have a proper financing and investment strategy based on its long range planning.
- ) DDC should make every effort to run the existing plants to utilize the idle equipment and addition of capital and manpower should be done by a well defined purpose to relate closely with the production.

2) Thapa (2000) has tried to point out some features and problems of profit planning in the context of Nepalese manufacturing enterprises study on profit planning of Dairy Development Corporation and Sita Ram Dairy Milk, submitted to the Central Department of Management, TU Mr. Thapa has listed the following major findings.

- ) DDC has concentrated its whole effort on the survival of the company.
- ) Sales figure (both targeted and achievement) of SRD are more inconsistent and variable than that of DDC.
- ) Both companies have positive correlation between actual and target sales.
- ) SRD's capacity utilization is poorer than that of DDC's capacity utilization.
- ) SRD's has highly been successful to maintain co-ordination than DDC.

- ) Overall responsibility of profit planning is under finance department in SRD whereas it is under account department in DDC.
- ) Both companies have not proposed profit planning except sales and production plan.
- ) DDC and SRD have been suffering from operating loss for many years. The main cause is low contribution margin ratio, high fixed cost and under utilization of capacity.

Mr. Thapa has recommended the following aspects to improve DDC's and SRD's planning and performances:

- ) Long term objective should be clearly formulated so as to make a clear distinction between profit motive and social motive and entrepreneurship is the first requirement for the success of any business.
- ) These companies are facing the problem of under capitalization by which production is affected. So to enhance the production capacity the necessary financial management should be over viewed.
- ) DDC and SRD should follow marginal cost pricing in addition to cost plus pricing. Adopting marginal cost pricing, both companies can retain all potential customers.
- ) Responsibility centers should be clearly defined. Reward and the punishment system for all the performance of related responsibility center should be maintained and it should be operated on purely commercial basis.
- ) The aspect of marketing management is necessary for evaluation from time to time.

3) Bhusal, (2001) has conducted the research on the topic" A Comparative study on Profit planning in Manufacturing and Non-manufacturing Public Enterprises of Nepal" .he had focused his study to highlight the current practice of profit planning and its effectiveness in Nepalese public enterprises. The study covers only 5 year 2051/052 to 2054/055 in his research paper he has used primary as well as secondary data.

Major findings of his studies were as follows:

- There is no adequate and clear cut co-ordination among various units in the organization.
- Objectives of the enterprises are controversial. There is conflict between profit and social goals.
- There is inadequate planning of profit due to lack of planning experts.
- There is lack of entrepreneurship and commercial concept in over all operation of the enterprises.
- The plans are based on ad-hoc and unrealistic forecast.
- There is red-tapism and delay in the implementation phase as shown by the achievement to below than the targets.

**Recommendations:**

- ) All the managerial level personnel must be participated in developing the profit planning.
- ) To eliminate red tapism, unnecessary formalities should be avoided which creates delays in decision making and other functions.
- ) All the possible tools of analysis such as CVP analysis, flexible budgeting, forecasting should be considered while preparing profit plan.
- ) Proper motivational program and reward and punishment system must be conducted.
- ) Price fixation and other managerial decisions should be free of government intervention.

4) Thapa (2002), has conducted a research entitled “Profit planning in Manufacturing Enterprises. A case study of Birgunj Sugar Factory Limited” She has focused her research in the application of profit planning in manufacturing companies.

Thapa’s study is based on primary as well as secondary data. The study period has covered five years from FY 2051/52 to 2055/56. In her research, she has pointed out the various findings and recommendation which are as follows:

Findings



- ) The management of the BSFL applied annual sales and production budget. There is substantial gap between sales target and achievement each year.
- ) Objectives of BSFL are not clear and measurable and top level management executives are only involved in planning and decision.
- ) There is not intra and inter department co- ordination and lack of co-ordination with other concerned authorities.
- ) There is poor policy as to sales, production, inventory and material budgets Attention toward cost structure and control program is not existed.
- ) There is no system of systematic forecasting.
- ) Expenses are not identified as fixed and variable and BSFL is unable to use contribution margin analysis approach
- ) There is no practice of preparing budget like raw materials, capital expenditure, direct labor budget, cash budget, performance report etc.

### **Recommendations**

- ) Budget should be prepared on realistic ground BSFL should try to minimize the gap and find out the causes of variation between planned and actual results.
- ) BSFL should study the present cost structure and develop cost effectiveness program for planning profit. There should be a good system of dividing cost into fixed and variable.
- ) To increase the financial performance of BSFL, capital, manpower and available assets and resources should be maximum utilized rather than increasing the volume.
- ) BSFL should analyze BEP for product or company as a whole for the proper planning of profit.
- ) BSFL should consider certain management, technical and financial issues.
- ) There should be motivation in employees, co-ordination within organization, participation of employees and they can be held accountable for their

authorities and responsibilities. BSFL should aware of latest technology invention and quality of product and cost incurrence there of.

5) Sharma (2003) has conducted a research entitled "Management Accounting Practices in listed companies of Nepal". He has focused his study to examine and study the practice of management accounting tools in the listed companies of Nepal. Mr. Sharma's research study is based only on primary data. Stratified random sampling with proportionate allocation of percentage is followed to draw the sample. In his study, he has pointed out various findings and recommendations which are as follows:

- ) Different types of management accounting tools which are taught in the colleges are not found applied by the listed companies of Nepal.
- ) Management accounting is to help managers in overall managerial activities by providing information and helping in planning, controlling and decision making.
- ) Nepalese listed companies are in infant stage in practicing of management accounting tools such as capital budgeting, annual budgeting, cash flow, ratio analysis, zero based budgeting, activity costing, target costing and value engineering.
- ) Lack of information and extra cost burden are the main reason behind not practicing such tools.
- ) As Nepal is proceeding towards globalization and to get membership (now already got the membership) of WTO, companies are recommended to apply management accounting tools to fit with the global environment.

6) Rijal(2005) has conducted a research entitled "Cost- Volume- Profit Analysis as a Tools to Measure Effectiveness of Profit planning and control: A case stud of Nebico private Limited " he has centered his study to examine CVP analysis as a tool in manufacturing industry and to analyze the CVP and its impact in profit planning.

Mr. Rijal's study is based on primary and secondary data. The study period has covered five years. Mr. Rijal has pointed out various findings and recommendations .Some remarkable findings were as follows:

- ) The company's variable cost is high in proportion than fixed cost in total cost amount, which contribute for lower contribution margin.
- ) The Company has high fixed costs (i.e. high salary and wages, technical and computer fees, depreciation, interest provident fund and subsidies).
- ) In Nepalese manufacturing Company especially in Nebico, there is no any plan to reduce cost. There is lack of effective cost control programs or techniques.
- ) The profit trend of the company is not satisfactory. S compared to profit, proportion is very low with fluctuated trend.
- ) The company has no detailed of any systematic expenses plan. The fixed, variable and mixed expenses plan is the necessary elements for profit planning and control.
- ) In the company, there is no effective inventory policy. The inventory management, raw material handling and controlling system are not efficient and effective.
- ) The board of directors is the main authority in price fixing and it directly interferes to price of biscuit and confectionery products.
- ) Nebico Pvt. (Ltd.) has not proper practice of segregating the costs into fixed and variable or controllable and non- controllable.
- ) There is not proper co-ordination among production, administration, distribution, inventory and sales department.
- ) Nebico Pvt. 9Ltd.) has not utilized its capacity.

### **2.23 Research Gap**

There is a significant gap between present research work and the previous research works. There are hundred of researches which are conducted mainly on profit planning and control and management accounting of public enterprises. In most of the researchers, profit planning tools are analyzed in one way or the other but their impact are rarely explained. Cost-Volume-Profit analysis and the sensitivity of their variables in modern business is a current issue but these facts are rarely studied by the previous researcher. To fill this gap, the researcher is intended whole heartedly to

conduct this research. For this purpose the researcher will examine the current practice of Cost-Volume-Profit analysis in the manufacturing industry, namely Gorakhkali Rubber Industry limited. Probably this might be the first research study carried out of one of the non-public enterprises on this topic in Nepal

# **CHAPTER III**

## **RESEARCH METHODOLOGY**

### **3.1 INTRODUCTION**

Research Methodology deals with the road map of the study. It deals with the way, the data are collected analyzed, figured and necessary conclusions and recommendation are made. It helps to analyze, examine and interpret various aspects of research works such aspects of cost volume profit analysis, related to an effective tools of profit planning. In this research work, various statistical techniques are applied in the research methodology. Research methodology is the way to solve systematically about the research problem (Kothari, 1990: P 39)

As the basic objectives of the present research is to highlight the current practice of cost volume profit analysis in Nepalese industry. In according with the basic objectives other sub-objectives are also formulated and research methodology is followed to achieve the objective of the research study. The major contests of research methodology followed in course of this study are as followed.

### **3.2 Research Design**

In order to make any type of research planned and systematic research design is necessary which fulfill the objectives of the study. Generally research design means defining procedures and technique which guide to study and propound design is the arrangement of conditions for collection and analysis of data in such a manner that it aims to combine relevance to the study purpose with economy in procedure. This study attempts to show the relationship among cast, volume and various functional budgets for their achievement and effective application within the conceptual framework of profit planning for solving the problems that have accused in GRIL. Therefore, this study is closely related to various accounting statements as well as the

actual results of the budget. Those information and data are presented by analytical method. But the qualities aspect of the research such as effectiveness of CVP in the industry, views of various managers and personnel and the theoretical presentations are explained in words wherever necessary. Therefore, analytical as well as descriptive research will be applied as the research design for the study.

### **3.3 Period Covered**

The period covered by the study is five years for trend analysis and one year for the analysis of cost volume profit variables and related aspects. The period covered is from FY 2060/61 to 2064/65.

### **3.4 Nature and Sources of Data**

The main source of the research is based on secondary data which has been taken mainly from annual report, balance sheet, auditors' report, P/L account, official records and publication GRIL. Previous dissertations and other related published and unpublished documents of industry.

### **3.5 Statistical Tools used**

Crude data are managed and analyzed in proper tables and formats. Interpretation and explanations are made wherever necessary.

To analyzed the colleted data, financial and statistical tools are used which are mean, regression, graphs, BEP chart, bar diagram, percentage ratio etc. similarly the accounting tools used as per necessary are contribution, margin, breakeven point, sensitivity analysis, etc.

### **3.6 Research Variables.**

Variables are two types. There are independent and dependent variables. Dependent variables depends one another variable. It changes causes of other variables. In dependent variables are the variables which can change other variables

or the variable whose value is given that is called independent variable and the variable. That value is to be predicted is called dependent.

There are three factors of CVP analysis i.e. Cost volume and profit which are depend and interconnected with each other. So, those factors are dependent variables. But, while testing the relationship between these variables, cost and volume (sales) are taken of independent variables whereas profit is taken dependent variable.

## Chapter IV

### Presentation and Data Analysis

#### 4.1 Sales Plan of Gorakhhali Rubber Industry Limited

Sales Planning process is a part of PPC because, it provides for the basis management decisions about marketing and based on those decisions it is an organized approach for developing sales plain. If sales plan is not realistic, most other parts of overall profit planning are not realistic; therefore a sales plan should be realistic. Gorakhhali Rubber industry limited doesn't have long range and short range sales plan. It has not properly maintained the annual sale budget. Since the industry doesn't plan sales therefore actual sales value has been analyzed actual sales value means the total monetary value of units sold of tyres, tubes, flaps, related rubber and related cement within the period of one year by GRIL. the following table shows the actual sales revenue collected by GRIL for five year from FY 2060/61 to 2064/65.

**Table No. 1**  
**Gorakhhali Rubber Industry Limited Sales Revenue**

<b>Year</b>	<b>Sales Revenue (Rs.000)</b>	<b>% Change</b>
2059/60	400985	-
2060/61	351620	(12)
2061/62	377500	7.36
2062/63	403018	6.76
2063/64	363993	(9.75)
2064/65	413540	13

*Source: Annual Report 2008*

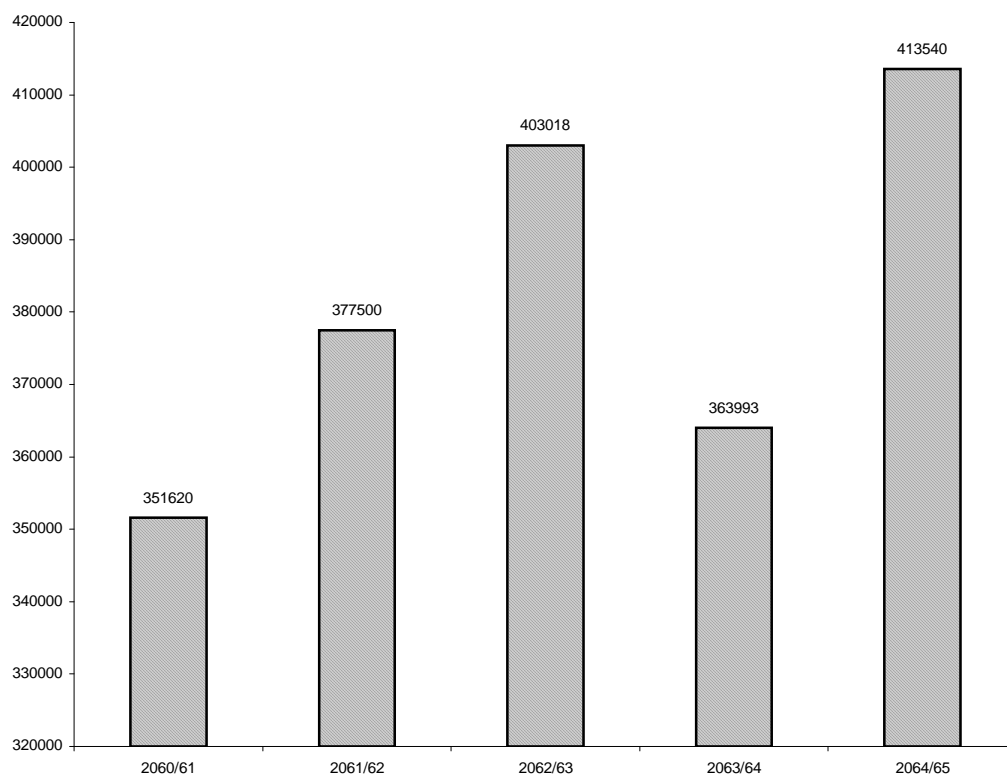
From the above table, it becomes clear that the total sales revenue of GRIL is fluctuating. In the FY 2060/61 and 2064/65, negative fluctuation which is 12% and 9.75% respectively. And other FY, sales revenue is positive fluctuation.



There are various significant reasons which are responsible for the variation in sales revenue and demand conditions of the products, cost of the products, political situation of the country political conflict, socio-political condition of the country, government policy, tough competition with imported product etc. Apart from the above mentioned causes there are other national and international reasons such as depression in international economic activities, transportation problem due to insecurity, rapid increment etc directly cause the fluctuation collected from export of tyres is minimum and zero as well as the last three years.

**The Presentation of the above total sales figure will be more effective. by following graph.**

**Figure 4.1: Total sales revenue**



## 4.2: Time series analysis of sales revenues

To analyze the trend of actual Sales, least square method can be used to estimate the possible future sales given time or year. A straight line trend will show the relationship between time period and actual sales of the relevant year. In this method it is assumed that the sales consistently by the change (increase or decrease) with the change in time and such change can be expressed by the component of time factor. In this method time factor is considered as independent factor and sales is considered as dependent factor upon time. Then straight line trend of actual sales (y) depends upon the time (x) which is expressed as:

$$Y = a + bx$$

For the calculation, the value of a (constant) and b (variable) can be obtained by solving the following two equations.

$$\sum y = na + b \sum x \quad \text{-----1}$$

$$\sum xy = a \sum x + b \sum x^2 \quad \text{-----2}$$

(See in appendix no. II)

Therefore,

$$a = 381934.2$$

$$b = 11033.3$$

### Equation

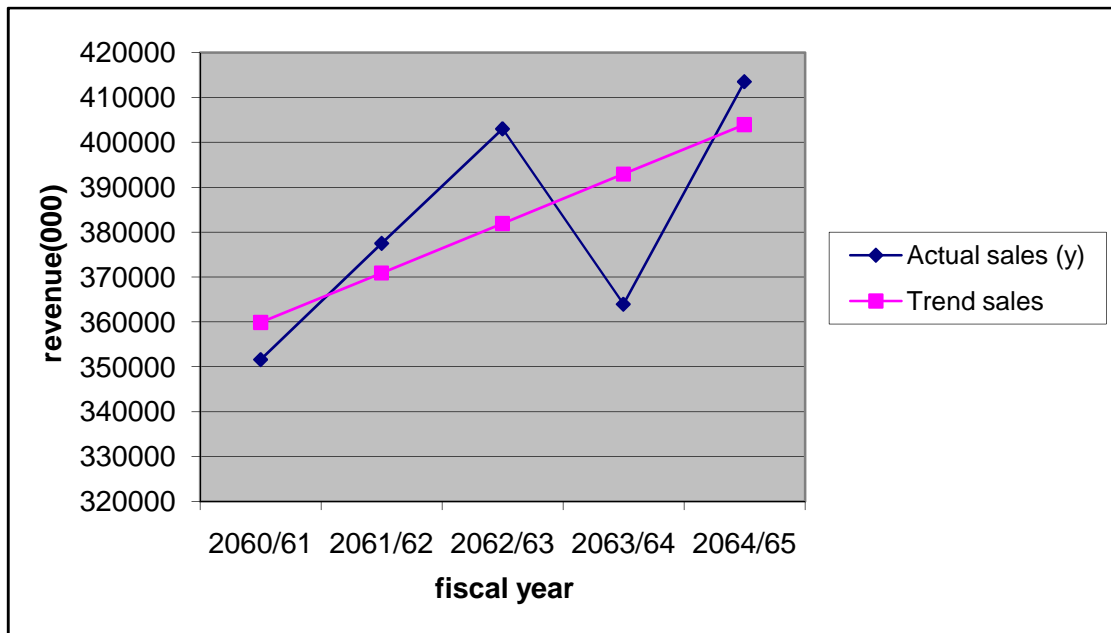
$$y = a + bx$$

$$y = 381934.2 + 11033.3 \times 6$$

$$y = 448134000$$

Therefore, if the trends change, the possible sales for the year 2064/65 will be Rs. 448134000. The presentation of the above sales figure with the trend will be more effective by following graph.

**+Figure 4.2: Time series analysis of Sales Revenue**



### **4.3 variable cost analysis of GRIL**

Variable costs are those cost which varies in direct proportion to change in output or activities level but per unit cost is constant within a certain period generally for a financial year. The industry as variable cost per unit is varying in different years, according to GRIL's cost detail sheet the variable costs are presented in the table below.

**Table No. 2**  
**Variable cost analysis of GRIL**

(Rs 000)

<b>Particular</b>	<b>2060/61</b>	<b>2061/62</b>	<b>2062/63</b>	<b>2063/64</b>	<b>2064/65</b>
<b><u>1. cost of sales</u></b>					
Raw materials	178593	188789	236008	218385	203836
Packaging materials	9107	4494	5144	5551	4852
Electricity and energy	43555	40803	46864	42371	45302
<b>Total</b>	<b>231253</b>	<b>234086</b>	<b>288016</b>	<b>266307</b>	<b>253990</b>
<b><u>2. Administrative costs</u></b>					
Traveling and daily allowance	2201	2830	2819	2111	2127
Printing and stationary	1293	871	670	346	437
Communication	1559	1666	1714	1299	1019
Books and magazines	-	-	37	44	45
Entertainment	363	396	698	424	375
Donation	214	126	200	117	126
Office supplier	612	479	448	541	499
Annual function	-	723	439	12	19
Legal and professional	1019	-	-	-	-
Meeting allowance	137	253	298	223	249
Audit fee	60	61	73	80	90
Trading expenses	76	108	207	81	91
Water and electricity	-	213	469	417	568
Fuel of vehicles	-	-	1835	2019	2217
Other expenses	2139	1619	1201	2892	2799
Bank commission	507	434	417	460	663
Managerial expenses	2307	-	-	-	-
<b>Total</b>	<b>10487</b>	<b>9777</b>	<b>10425</b>	<b>11072</b>	<b>11324</b>
<b><u>B. selling and distribution cost</u></b>					
Cash and discount	15635	12755	12113	19272	17325
Export expenses	-	-	227	-	-
Transportation	1808	2777	1656	1368	1836
Loading and unloading	97	59	20	20	35
Reimbursement expenses	521	3996	3355	5461	4915
Others	126	142	-	-	-
Selling Discount	13432	8489	20382	-	3950
<b>Total</b>	<b>36314</b>	<b>27099</b>	<b>38878</b>	<b>26123</b>	<b>28061</b>
<b>Total variable cost (1+2+3)</b>	<b>278056</b>	<b>270962</b>	<b>337319</b>	<b>303502</b>	<b>293375</b>
<b>Change %</b>	<b>4.62%</b>	<b>1.20%</b>	<b>4.97%</b>	<b>5.85%</b>	<b>2.35%</b>

*Source: Annual Report 2008*

The table shows that the fluctuation on VC from fiscal year 2060/61 to 2064/65. In the fiscal years 2060/61 to 2064/65, the percentage changes on VC are 4.62%, 1.20%, 4.97%, 8.85% and 2.35% in respective years.

Above table shows that there is variation in variable cost of sales, administrative cost and selling and distribution cost for different years. Different factors are responsible for changing in cost of sales such as fluctuation in price of electricity in the domestic market. Administrative cost is slightly fluctuated. the cause of the fluctuation of the administrative cost, traveling and daily allowance, printing and stationary, communication, entertainment cost, audit fee, meeting allowance etc are responsible cost of the reimbursement of tyre, cash discount given to customers, transportation cost etc are responsible for fluctuating of variable costs.

#### **4.4 Fixed Cost Analysis of GRIL**

Fixed cost are the costs which remain constant in total despite the changes in the level of activity within every year (within relevant range) as the production units increase fixed cost per unit decrease, it is because same cost will be decreased in more production units. But fixed costs in total may vary for different fiscal year. The fixed cost of GRIL is presented in the table below.

**Table No.3**  
**Fixed Cost Analysis of GRIL**

(Rs.000)

<b>Particular</b>	<b>2060/61</b>	<b>2061/62</b>	<b>2062/63</b>	<b>2063/64</b>	<b>2064/65</b>
<b><u>1. Cost of Sales</u></b>					
Repair and Maintenance					
Plant and Machinery	10795	4194	4139	3139	3036
Construction infrastructure	105	-	89	81	94
<b>Total</b>	<b>10901</b>	<b>4194</b>	<b>4228</b>	<b>2220</b>	<b>3130</b>
<b><u>2. Administrative Cost</u></b>					
Repair and Maintenance	838	821	699	553	566
Employee expenses	38222	40615	44648	43933	44914
Tax and fees	143	203	140	662	563
Advertisement and formation	1175	91	103	83	92
Insurance	2306	1804	1779	1742	1925
Preliminary expenses	-	-	115	137	147
Technical expenses	-	4113	3207	2060	2560
<b>Total</b>	<b>42684</b>	<b>47647</b>	<b>50691</b>	<b>49170</b>	<b>50767</b>
<b><u>3. Selling and distribution</u></b>					
Sales promotion	2007	1752	2466	1067	2343
Sales Bonus	2669	1789	1813	3434	2550
<b>Total</b>	<b>4676</b>	<b>3541</b>	<b>4279</b>	<b>4501</b>	<b>4883</b>
<b><u>4. Other Fixed cost</u></b>					
Depreciation	34761	32199	28910	26911	30912
Interest	57089	57912	64455	55931	58321
<b>Total</b>	<b>91830</b>	<b>90111</b>	<b>93365</b>	<b>82849</b>	<b>89933</b>
<b>Total Fixed Cost</b>	<b>130111</b>	<b>145493</b>	<b>152563</b>	<b>138733</b>	<b>148013</b>

*Source: Annual Report 2008*

The above table shows that the fluctuation on total fixed cost form FY 2060/61 to 2064/65. It is in increasing order for first three fiscal years than, it is decrease in remaining two fiscal year. The total fixed cost for the fiscal year 2060/61 is Rs 130111 and in the fiscal year 2064/65 is Rs 148013.

This variation is caused by the variation in cost of sales, administrative cost, selling and distribution cost and other fixed costs normally depreciation and interest. The industry is paying a huge amount of interest for the loan borrowed from bank and financial institutions.

#### 4.5 Semi- variable cost Analysis

Semi variable costs are the one which remain some for certain relevant range and then change as per the activity level. The industry has not particular method to segregate the semi variable costs. According to the high level financial officer and other managerial personnel, semi variable cost are classified into variable and fixed by the relevancy their nature and the judgment of the related officers on going through the interview with companies senior officers, they have the practice of separating variable costs into fixed and variable but no particular method has been used except the judgmental basis .therefore, the above mentioned cost were classified into variable and fixed as per the suggestion and detail given by the senior staffs of the industry.

#### 4.6 Profitability Analysis of GRIL

**Table No. 4**

**Profitability analysis of Gorakhkali Rubber Industry Limited**

**Amount (Rs.000)**

<b>Fiscal year</b>	<b>Gross profit</b>	<b>Operating Profit</b>	<b>Net Profit</b>
2060/61	106470	15495	(76355)
2061/62	94567	13643	(87355)
2062/63	114433	11644	(18720)
2063/64	98672	8027	(74815)
2064/65	110542	9656	(63575)

*Source: Annual Report 2008*

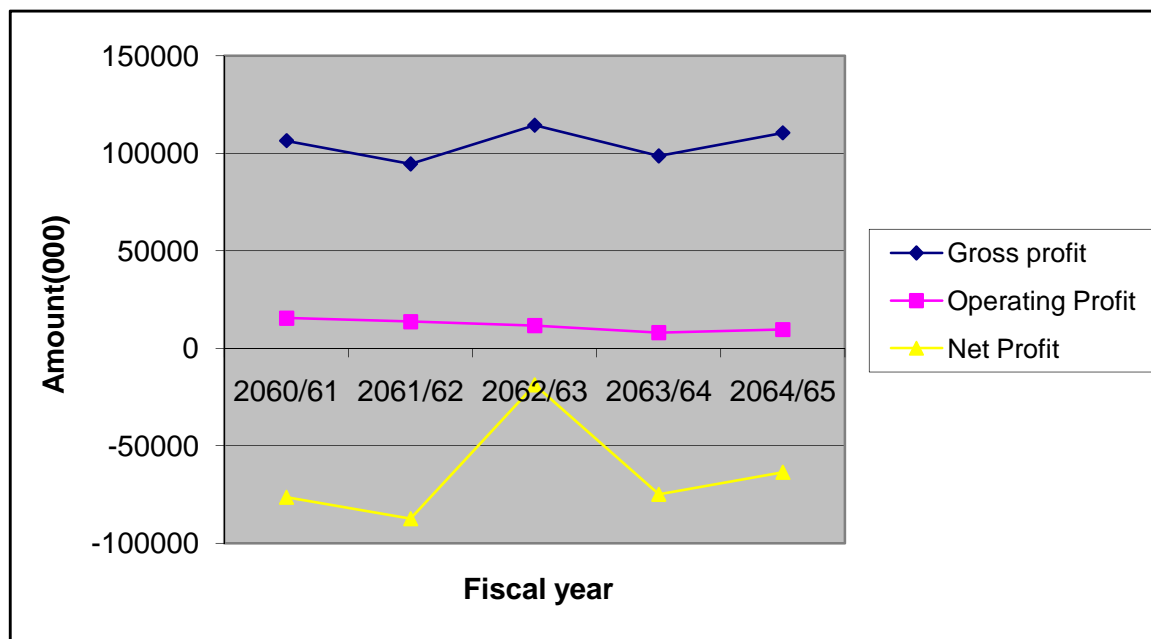
The above table predicts that the company has been suffering from net loss for years. There is variation in the amount of net loss. It is very miserable condition for any industry.

The industry is suffering net loss from so many years. The amount of loss is highly fluctuated because in some of the years the industry's performance was satisfactory. There are numerous aspects for continuous loss of the industry which are liquid political condition of the industry, unstable industrial environment, tough competition with the imported tyres and tubes, increasing cost, fluctuation in the price of saw material in the international market etc, apart from the above mentioned factors there are other internal and external factors causing the continuous loss of the industry which are low utilization of capacity, excessive strikes and bands price problem due to under utilization of the production capacity. The industry is able to make operating profit (profit before interest and depreciation) in each year from 2060/61 to 2064/65. But due to the huge amount of interest paid to Asian development, Nepal Bank, HMG Nepal I highly responsible for the loss suffered by the industry on the other hand due to high original cost of the plant and machinery, depreciation is further responsible.

Gross profit, operating profit and net operating profit is shown by the following graph.



**Figure 4.3: GP, OP and NP**



#### 4.6.1 Gross profit Margin Ratio

**Table No.5**

#### Gross profit Margin Ratio of Gorakhkali Rubber Industry Limited

<b>GP Margin Ratio for the FY 2060/61</b>	<b><math>\frac{106470}{400985}</math></b>	<b>26.55%</b>
<b>GP Margin Ratio for the FY 2061/62</b>	<b><math>\frac{94567}{351620}</math></b>	<b>26.89%</b>
<b>GP Margin Ratio for the FY 2062/63</b>	<b><math>\frac{114433}{403018}</math></b>	<b>28.39%</b>
<b>GP Margin Ratio for the FY 2063/64</b>	<b><math>\frac{98672}{363993}</math></b>	<b>27.19%</b>
<b>GP Margin Ratio for the FY 2064/65</b>	<b><math>\frac{110342}{413540}</math></b>	<b>26.36%</b>

The Gross margin ratio in the year 2060/61 is 26.55%. And in the year 2061/62 is 26.89%. From the above calculation, it is clear that there is no high variation in gross profit margin. The range of gross profit margin is 26% to 29%.

It is identified that there are lots of competition in the tyre market. GRIL has been facing high competition on its sales cost of goods sold and other factors. So, the gross profit margin is low in different years. It is not good for the company itself because gross profit should cover other operating and non operating cost as well as it should cover financial cost. This percentage of GP margin ratio represents the comparatively low gross profit margin which cannot be assumed as good management.

#### **4.6.2: Net Profit Margin Ratio**

**Table No 6**  
**Net Profit Margin Ratio of GRIL**

<b>NP Margin Ratio for the FY 2060/61</b>	<b><u>(76355)</u> 351620</b>	<b>-21.71%</b>
<b>NP Margin Ratio for the FY 2061/62</b>	<b><u>(87355)</u> 377500</b>	<b>-23.14%</b>
<b>NP Margin Ratio for the FY 2062/63</b>	<b><u>(187220)</u> 403018</b>	<b>-4.64%</b>
<b>NP Margin Ratio for the FY 2063/64</b>	<b><u>(74815)</u> 363993</b>	<b>-20.35%</b>
<b>NP Margin Ratio for the FY 2064/65</b>	<b><u>(63575)</u> 413540</b>	<b>-15.37%</b>

This result shows that the company has suffered the huge amount of net loss and this is not the indication of efficiency of the business and utilization of resources. But still this figure indicates that on rupee increase in sales helps to further increase of loss by 21.71%, 23.14% , 4.64%, 20.55% and 15.37% for the fiscal years 2060/61 to 2064/65 respectively.

## 4.7 Cost Volume Profit Analysis of Gorakhakali Rubber Industry Limited

**Table No. 7**

### **Income statement for the year 2060/61 to 2064/65**

Particulars	Years				
	2060/61	2061/62	2062/63	2063/64	2064/65
Sales Revenue	351620	377500	403018	363993	413540
Less variable cost	278056	270962	337319	303502	293375
Contribution margin	73774	106538	65699	60491	120165
Less fixed cost	150111	145493	152563	138733	148013
5. Net Profit (3-4)	76337	38955	86864	78242	27848

The above table shows that the negative net income. The values of the net income for the five years are Rs.76337000, Rs.38955000 Rs. 86864000 Rs. 78282000 and 27848000 respectively years in 2060/61 to 2064/65. The cause of negative net income, FC and VC costs are responsible the production and sales revenue is very low as the compared with fixed cost.

## 4.8 Analysis of contribution margin ratio BEP and margin of safety

Contribution margin is difference between sales amount and the variable cost. It is also an amount which is equal to fixed cost plus the profit contribution margin can be written in the formula from as :  $CM = \text{sales Revenue} - \text{variable cost}$  for the table below contribution margin of the company is fluctuating between FY 2060/61 and FY 2064/65.

Contribution margin ratio is also known s profit volume ratio as the contribution margin fluctuates generally, CM ratio also fluctuates and the case is same here.

**Table No. 8****Analysis of contribution margin ratio, BEP and margin of safety**

(Rs. In '000')

Particular	Year				
	2060/61	2061/62	2062/63	2063/64	2064/65
Sales revenue	351620	377500	403018	363993	413540
Contribution	73774	106538	65699	60038	120165
CM ratio PVR(CM/Sales)	21%	28%	16%	17%	29%
BEP (fixed cost / PVR)	714814	519618	953519	816076	510389
BEP as percentage of sales	203.29	137.64	236.59	294.2	37.45
Margin of safety (AS- BE sales)	363194	142118	550501	152083	96849
MOS percentage of sales	103.30	37.64	136.59	129.20	114.83

*Source: Annual Report 2008*

The above table shows that the calculation of CM for the FY 2060/61 to 2064/65. CM is fluctuating trend for five years. High CM is signal of high profit; low CM is the signal of low profit. From the above table one can clearly know that CM is very low. It does not cover the fixed cost, by result, the company is bearing huge amounts of loss so management should try to be increased the value of the PV ratio by reducing the variable cost or by increasing the selling price.

The above table shows that the fluctuation on BEP for each fiscal year 2060/61 to 2064/65. The BEP is higher than the actual sales. Which show that it is necessary to increase in sales to cover cost and management should plan for its cost reduction.

The margin of the safety for the study period is negative because the BEP sales is greater than actual sales. BE sales must be equal to actual sales or actual sales should be greater than BE sales.

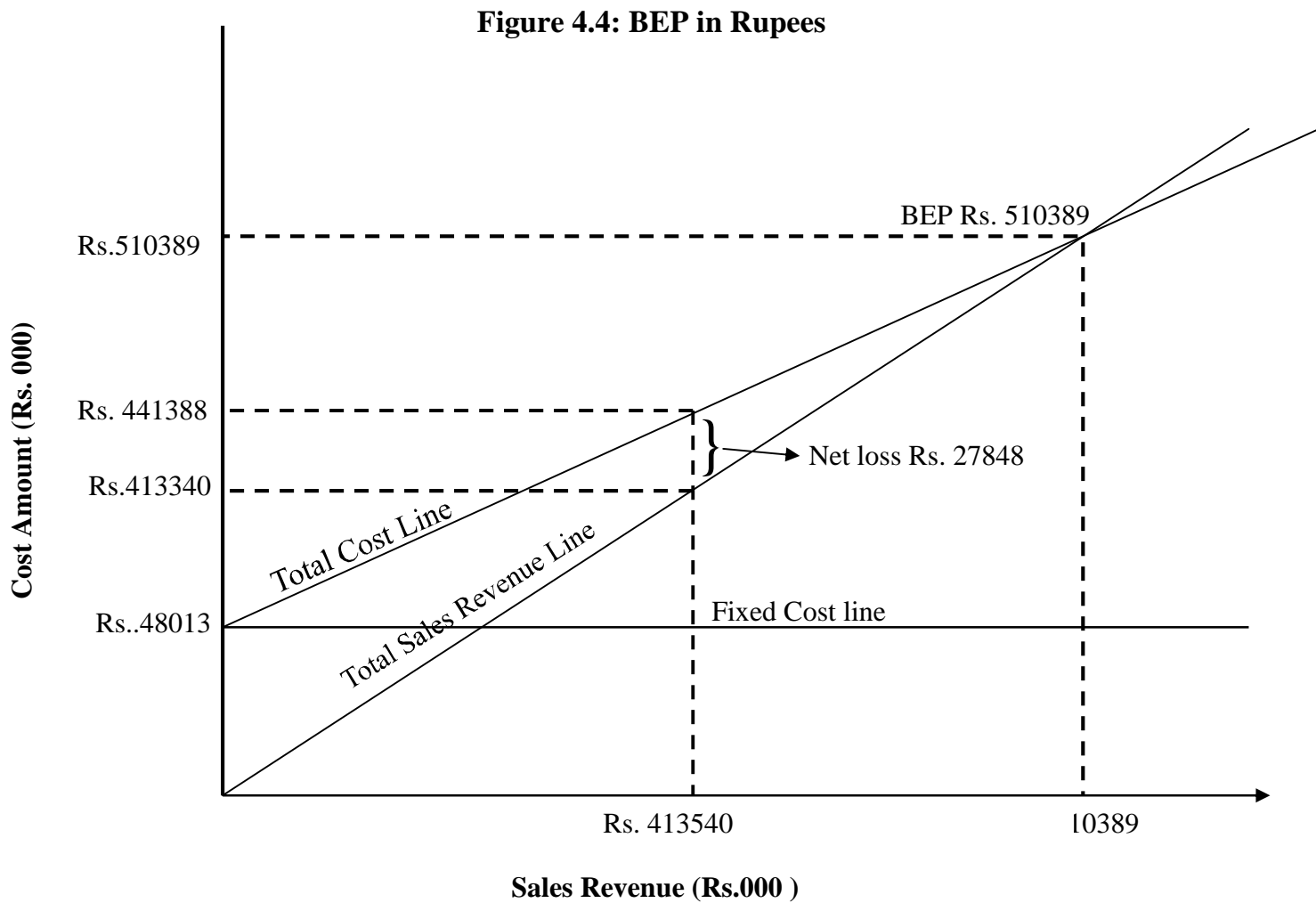
Following computation shows the

BEP in Rs fY 2064/65

$$\begin{aligned} \text{BEP in Rs.} &= \frac{\text{fixed cost}}{\text{Pv ratio or cm ratio}} \\ &= \text{Rs.510389000} \end{aligned}$$

This computation can be represented in the graphical figure which is as follows.

Graphical Representation of BEP (Rs.) for the FY 2064/65)



A simple break even chart of GRIL for the fiscal year FY 2064/65 is shown in the above. Sales revenue is shown is x-axis and cost amount is shown is y axis the required information and BEP chart for other years are given in above chart. For the above chart the total fixed cost of the industry is Rs 14,80,13,000. It is parallel to x axis. Since, e variable cost of the industry directly varies with unit of production, therefore it is slapping upward to right side. If no pro function is made variable cost is zero but still the company should bear the fixed cost of Rs 14,80,13,000, total sales revenue curves, originates from the origin because sales revenue is zero when sales volume is zero and as the sales volume increase, sales revenue also increases. He equilibrium point in the graph where total sales revenue and total cost cross with each other is known as break even point below this point .the company cannot cove is cost as a result it suffers the loss and above this point sales revenue exceeds the total cost which provides the profit to the economy. In the figure above GRIL has not even reached the breakeven condition i.e. total cost Rs. 441388000 exceeds the total revenue Rs. 413540000 resulting the loss of Rs. 27848000 for the year 2064/65. it industry is always suffering loss because of the high fixed cost namely interest and depreciation. Production and sales volume is shown poor condition. It is shown that the production volume increase, the profit will be increased

#### 4.9: Measuring Risk: degree of operating leverage (DOL)

**Table No. 9**

Income statement and DOL of Gorakhkali Rubber Industry Limited

Particulars	2060/61	2061/62	2062/63	2063/64	2064/65
sales revenue	331620	403018	363993	403012	413540
less VC	278056	270962	337319	303502	299375
CM	737744	106538	65699	60491	120165
less fixed cost	150111	14593	152563	138733	148013
Net income	76337	38455	86864	78282	27848
Add Interest	57089	57912	64455	55931	58321
EBIT	19248	18957	22409	22351	30473
DOL	3.65	5.61	2.93	2.71	3.94

*Source: Annual Report 2008*

The above table shows that the DOL is high each and every year so that the industry is in risky condition. Similarly, the above table shows that if sales will increase by 1% then the operating loss will increase by 3.65, 5.61, 2.93, 2.71 and 3.94 times from FY 2060/61 to 2064/65.

DOL for the year 2064/65 =  $\frac{120165}{30473}$

$$120165 - 148013 + 58321$$

= 3.94 times

The DOL of GRIL is 3.94 times which means every percentage change in sales causes 3.94 times greater percentage change in net operating income. More than approximately 25.38% decline in sales revenues causes more than 100% ( $25.38 \times 3.94$ ) decline the existing level of net operating income. Therefore, a levered firm is always riskier than an un-levered firm in bad times. But in good times, a levered firm's net operating income increases in higher production than the increase in sales. Therefore it is riskier for GRIL when the time is riskier for GRIL when the time is not favorable or the market condition is not satisfactory.

#### **4.10 Sensitivity analysis; assessing the impacts of the changes in cost volume profit variables.**

##### **4.10.1 Assess in the impact when selling price is changed.**

Break even point will also be changed if selling price or value is changed it because change in selling price brings the change in profit volume ratio and finally brings the change in break even point change in selling price also brings the change in profit loss.

**Table No. 10**

#### **Sensitivity analysis of Gorakhakali Rubber Industry Limited.**

##### **Income statement by 10% change in selling price of Year 2064/65**

**Rs(000)**

<b>Particular</b>	<b>Original Sales Revenue</b>	<b>10% increase in Sales Revenue</b>	<b>10% Decrease in Sales revenue</b>
Sales	413540	454894	372186
Less VC	293375	293375	293375
CM	120165	161319	78811
Less fixed cost	148013	148013	148013
Net income	-	13503	69202
Change in Net income	-	51.51%	612%
PVR	29%	35.51%	21.18%
BEP in Rs.	510389	416821	698833

*Source: Annual Report 2008*

The above table shows that when sales value is increased by 10% net loss is decreased and net profit is Rs. 13503000. Similarly profit volume ratio is increased to 35.51% from the 29% the breakeven amount is decreased to Rs416821 form the Rs. 510389.



When the sales value is decreased by 10% net loss is increases by Rs 69202. PV ratio is only 21.18% when sales volume is decreased but BEP amount is increased to Rs 698833 form original BEP of Rs 510389.

The above table shows that, selling price has increased. That causes the increase in the selling price and ultimately sales revenue will be increased. But fixed cost is constant so that the sales revenue is higher than the profit and PVR are also high. Due to the constant of FC and increasing PVR, the industry's BE sales will be decreased.

In opposition, selling prices is decreased that causes to the decrease in selling price, the sells revenue will be decreased. But fixed cost is constant. The cause of constant of the fixed cost and decrease in sales revenue, the minimized the gap of sales revenue and total cost so that the profit and PVR is also decreased. Due to the decrease in PVR, the BE sales will be increased.

#### **4.10.2 Assessing the impact when variable cost is changed**

If the variable cost is changed without changing the selling price and fixed cost, we can easily product the result. When variable cost is increased profit volume ratio will be increased as a result profit will be decreased and vice –verse when variable cost is decreased.

**Table No. 11**

**Sensitivity analysis of Gorakhakali Rubber Industry Limited**

**Income Statement by 10% change in variable cost of the Year 2064/65**

**(Rs,000)**

<b>Particular</b>	<b>Original VC cost</b>	<b>10% increase in VC cost</b>	<b>10% Decrease in In VC</b>
Sales in Revenue	413340	413540	413540
Less VC	293375	3927125	264037
CM	120165	90828	149502
Less fixed cost	148013	148013	148013
Net income	27848	57085	1499
PVR	29	21.96	36.15
BEP in Rs.	510389	704824	409441

*Source: Annual Report 2008*

From the above table, when no change is brought in VC, the CM is Rs. 12,01,65,000. But when, the VC is increased by 10%, the net loss of the company is increased because the CM is not enough to cover the fixed cost. But in the other hand when VC is decreased by 10% CM is increased but the loss of the company is decreased. when the change is brought in VC, profit volume ratio is also changed and as a result BEP sales value is also change only 10% increased in VC, BEP is reached by Rs. 704824000 from 510389 and only 10% decrease in VC BEP is also decreased the value reached Rs 40,94,41,000 from 51,03,89,000.

#### 4.10.3 Assessing impact when fixed case changed

**Table No. 12**

Sensitivity Analysis of GRIL

Income statement by 10% change in fixed cast

(RS,000)

Particulars	Original FC	10% Increase	10% Decrease
sales	415340	413540	413540
less	293375	293375	293375
em	120165	120165	12065
less FC	148013	162814	133211
Net income	27848	42649	13047
PX	29%	29%	29%
BEP in Rs.	510389	561427	459348
% Changed		10%	13.91%

*Source: Annual Report 2008*

In the above table shown that 10% increase in FC, net loss is increased, it is because more amount of FC is to be covered by the same amount of CM. As a result BEP amount is also increased when the FC is increased. When the FC decreased by 10%, BEP amount is also decreased by 13.91% and the net loss is decreased. It is because less amount of fixed cost is to be covered by same amount of cm.

**Table No. 13**  
**Gorakhakali Rbber industry limited**  
**Product wise income statement for FY 2064/65**

Particular	Products				
	Truck	%	Non-truck	%	Total
Sales Revenue	248124	60	165416	40	413540
Variable cost	161356	55	132019	45	293375
Contribution margin (1-2)	86768	72	33397	28	120165
Attributable F.C.	46063	-	37687	-	83750
Product CM (3-4)	40705	-	4290	-	36415
Joint fixed cost	-	-	-	-	64263
Net income (5-6)	-	-	-	-	27848
CM ratio	35		20	-	-
Product breakeven FC/CM ratio	422894		740065	-	-
Company breakeven Rs.					510389

*Source: Annual Report 2008*

As per the information provided by the industry the proportion of sales mix is 60% and 40% from truck and non truck tyres respectively. The contribution margin ratio for truck and non truck tyres is 0.34 and 0.20 respectively .the weighted average of each product and BEP is calculated as follows:

For truck tyres:

$$\begin{aligned} \text{Weighted average} &= \text{SM} \times \text{PV Ratio} \\ &= 60 \times 0.35 \\ &= 21 \end{aligned}$$

For non truck tyres:

$$\begin{aligned} \text{Weighted average} &= \text{SM} \times \text{PV Ratio} \\ &= 40 \times 0.20 \\ &= 8 \end{aligned}$$

$$\text{Total weighted average} = 21+8 = 29$$

$$\text{BEP in Rs.} = \frac{\text{fixed cost}}{\text{weighted average}} \times \frac{148013}{0.29} \times \text{Rs.} 510,389,000$$

From the above table, the product contribution margin Rs. 40,705,000. the contribution margin ratio is 0.35 for the truck. The product break even point is Rs. 422,894,000 . On the other hand for non truck the product contribution margin is negative ie Rs. 4,290,000 but the company as a whole in positive product contribution margin of Rs 36,41,5000. the contribution margin ratio for non truck 0.20 which is very low a compared to truck's contribution margin ration. The break even sales for truck is Rs. 5,10,389,000. which is independent with sales; mix. The company break even is in between two products break even value because net income generated from the product truck is utilized to recover the loss incurred from the product non truck. It is abviouses form the table that truck products are more profitable than non truck products.

#### **4.11 Major findings**

From the analysis of the various data collected by primary and secondary sources, the major findings of the study are as follows:

- 1) Sales plan of GRIL is not properly maintained. The industry uses the various methods for sales planning like market survey: distribution networks etc. But up to date record is not maintained. So they have poor budgeting system. Sales trend of GRIL shows the negative and positive directions which can further increase and decrease in the net loss for future. The sales trend is very fluctuating.
- 2) GRIL does not practice the scientific and appropriate cost classification technique. Costs are classified into fixed and variable as per the decision of the management.
- 3) Out of the total cost of GRIL variable cost is almost 60% in every year which cause the low contribution margin. GRIL is in high interest bracket, out of the total fixed costs almost 60% is to be paid for interest.

And the profitability of the company is greatly influenced by high fixed cost.

- 4) The industry does not have any detailed and systematic practice of planning of cost which is one of the essential elements of profit planning and control.
- 5) The profitability of the industry is very poor. Every year the industry is suffering from loss. The financial position of the industry is not satisfactory. Gross profit margin ratio and net profit margin ratio are not satisfactory.
- 6) GRIL has recently made an agreement with Modi Group of India for management, marketing & technical support. GRIL believes that this agreement will help to extend its marketing share in India as well as in other Asian countries.
- 7) GRIL is utilizing only 35% capacity. The full capacity of the industry is 3 shifts per day but it is running with one shift per day only which is one of the reasons of high of its product.
- 8) As the degree of operating leverage is very high the industry is at risk. If the sales revenue slightly decreases it suffers huge amount of loss and vice-versa.
- 9) The industry facing the problem of raw materials dependency and fluctuation in the international price of rubber, sometimes it also faces the problem of raw material security as well.

## **Chapter V**

### **Summary, Conclusion and Recommendation**

#### **5.1 Summary**

In the present era, industrialization has become essential element for the development of the country. Industry promotes economic development by providing employment & by mobilizing the unutilized resources. Therefore, the strong need of public sector and private sector is felt for the growth and economic development of the country through industrialization . By the realization of this fact, many public and private enterprises were established.

But unfortunately the performances of Nepalese enterprises are remained unsatisfactory due to various factors such as lack of clear – cut goals and objectives, poor planning, corruption in public enterprises, political motivation of top level management etc. in Nepalese organization, effective and efficient planning system is rarely found in practice. Comprehensive profit planning and control system which is considered as the life blood of any organization and keeps the organization alive, assures the future and creates the soundness on it, is not fully utilized and most of the managers are lacked of it.

Gorakhkai rubber industry limited is only one rubber industry of the country and its main objective is to produce tyres and tubes of exportable quality which substitutes the import of tyres and tubes.

The main objective of his study was to highlight the cost- volume-profit analysis as a tool to measure the effectiveness of profit planning and control of Gokahakali Rubber industry limited. So, the study was fully devoted to examine the CVP analysis of the industry. Apart from he qualitative data related to CVP, other , behavioral aspects of comprehensive profit planning and control were also studied. As per the objective of the study, various primary and secondary data were collected for five years from Fy 2061/62 to Fy 2064/65.

The collected data from primary and secondary sources were analyzed with descriptive and analytical approach. Sales trend analysis, costs analysis, profitability analysis BEP analysis, sensitivity Analysis, product mix analysis etc. were done with the help of both statistical and financial tools. Primary data were collected by direct interview with the concerned employees and questionnaire filled by senior level staffs of GRIL whereas secondary data were drawn from the various documents like annual Reports of GRIL, newsletter etc, published by industry and concerned authority. From the various analyses of cost-volume-profit variables, the company shows different results. The industry has low contribution margin ratio, high fixed costs and low margin of safety. The degree of operating leverage shows the industry has very risky position and it incurs further the loss if the situation is pessimistic. The financial position is not sound as gross profit and net profit margin and net profit margin ratios are not satisfactory . The industry is continuously suffering loss every year because of its high fixed for interest to long term loan the industry . The industry claims that it has followed scientific cost classification techniques but the proof of cost expenses plan could not be found. According to high level, managers, of the industry financial division has the responsibility of the budgeting: profit planning and control but due to the lack of sufficient financial resources and detail information, GRIL has not practiced CVP analysis technique as a tool to measure the effectiveness of profit planning and control.

## **5.2. Conclusion**

The analysis shows there is a vast gap between theory and practice in the context of Nepalese industries. Different types of profit planning tools are taught in colleges but their application is hardly found in Gorakhkali Rubber Industry. It is taught in the colleges and university that budgeting is a tool of profit planning and control but GRIL has not prepared proper sales plan. Due to the lack of budgeting system, the actual data could not be compared with the planned for the variable analysis has not been done. The industry has neither practiced the scientific cost allocation technique nor the cost plan for the



period. The industry has not practiced CVP analysis as a tool of profit planning and control.

From CVP analysis it is found that the industry has low contribution margin and high fixed cost. Employee expense has played the key role to increase the administrative fixed cost. Similarly interest paid for long term loan to, Nepal Government, Nepal Bank Limited and other commercial banks is also very high. Due to high fixed cost associated with interest and depreciation, BEP sale is very high for the industry. The company has always been run below BEP and the loss of the business is being accumulated every year. The sensitivity analysis in response to change in variable cost revenue is comparatively high but it is same in case of fixed cost. The product mix analysis shows that truck tyre is more profitable than that of non-truck tyre. Similarly, degree of operating leverage of the company shows that the company is in risky position; Underutilization of capacity has become a big issue for the organization. As the decision making power is concentrated in top level management, participative management approach to set the goals is rarely found in the organization.

If the management does not start utilizing full capacity right now and initiate the effective cost control program, Gorakhkali Rubber Industry Limited may bear further loss in future and this might be a bitter experience in the history of industrial sector of the country.

### **5.3. Recommendations**

As Nepal has already got the membership of WTO, BIMSTEC, SAFTA and other International Organizations, Nepalese industries should fit with this environment. Nepalese products will be in the trap of cut throat Competition. The future of the Nepalese industries largely depends on their strategic fit and for this, managers should be aware of the current business issues and their impact in own business. To have strategic advantage over the competitions,

Nepalese industries required identifying the various tools of accounting and the relevant aspects should be analyzed and applied. Gorakhkali Rubber industry has a lot of potential not only within the country but also in South Asian region. Having the monopoly power in tyres and tubes, it has not covered the market by its product as it should do. There are various factors/aspects to be recognized by the management of the industry. On the basis of the findings of the research study, the following recommendations are given to improve the present condition of the industry:

- ) Gorakhkali Rubber industry Limited should clearly define its goals and objectives. And management should make sure that each & every employee is aware of the organizational objectives, which are the basic foundations of planning because conflicting goals always create confusions in their application phase.
- ) The industry do not have proper practice of budgeting. Therefore, it is recommended that the company should develop the budgeting practice, which is one of the tools of profit planning. To improve the financial condition of the industry, it should develop annual (tactical) and long term profit plan.
- ) GRIL do not have separate costing department. Costing is done by traditional methods combining with judgment basis and no precise distinction has been made regarding the nature of the cost as fixed or variable, controllable and non-controllable, director indirect etc. So the industry should establish a separate costing department, if possible and cost classification must be made within a specific framework of responsibility and time.

- ) As the share of the industry in .Nepalese market is only about 55% of the total market. The company should - follow effective advertising policy and other promotional campaigns. Marketing specialists should involve to increase present sales volume and to find new areas where profit potential is high. The industry should further expand its products to international market especially in south Asia.
  
- ) The industry should consider the cost-volume-profit relationship while fixing the price of its products.
  
- ) The industry does not have any detailed and systematic practice of cost plan, which is one of the essential elements of profit planning and control. Therefore, it is recommended to initiate the cost planning system. -
  
- ) GRIL is bearing huge amount of fixed costs for employee expenses which is not a good for the organization. Therefore, the industry should initiate the cost control program
  
- ) Price rising is not only one alternative to increase revenue or sales amount, controlling is necessary and by which wasteful expenses are automatically decreased. Therefore, it is recommended to adopt effective controlling tools.
  
- ) GRIL has invested big amount in fixed costs for generate profit by maximum utilization of available resources, but analysis shows the poor utilization of fixed assets. Therefore, the industry should put stress .on effective utilization of fixed assets.
  
- ) GRIL is paying a huge amount as interest on long term loan, which is not good for the industry. So it should emphasize internal financing to

minimize such burden. Therefore, GRIL must restructure its capital structure so that the interest burden will decrease.

) The industry is running only at 35% of its full capacity and one shift per day. This problem is solely responsible for high per unit cost of tyres. Therefore to compete easily with exported tyres, the industry should utilize its full capacity, so that per unit cost of tyre will be comparatively low.

) The products of GRIL are of very high quality but still the industry is bearing huge amount of cost every year for reimbursement of tyres. Therefore, reimbursement policy should be very strong and followed strictly.

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**Appendix:-II**  
**Gorakhkali Rubber industry limited time series analysis**

(Rs. 000)

Year (x)	Actual sales (y)	X= x- x	xy	X <sup>2</sup>	Trend sales
2060/61	351620	-2	-703240	4	359867
2061/62	377500	-1	-377500	1	370900
2062/63	403018	0	0	0	381933
2063/64	363993	1	363993	1	392967
2064/65	413540	2	827080	4	404000
Total	1909671	0	110333	10	

Here, Given,

$$\sum y = 1909671$$

$$\sum x = 0$$

$$\sum x^2 = 10$$

$$\sum xy = 110333$$

Normal Equation

$$\sum y = na + b\sum x \text{ -----1}$$

$$\sum xy = a\sum x + b\sum x^2 \text{ -----2}$$

Putting the value of given value in normal equation,

$$\text{Or } 1909671 = 5a + 0b$$

$$\text{or } 110333 = 0a + 10b$$

$$\text{Or } a = \frac{1909671}{5}$$

$$\text{or } b = \frac{110333}{10}$$

$$= 381934.2$$

$$= 11033.1$$



**Appendix -I**  
**Gorakhkali Rubber Industry Limited**  
**Organizational Structure**

