CHAPTER - I
INTRODUCTION

1.1 General Background

Nepal lies in the line of least development country of the world with per capita income of $ 320 (World Bank Report 2009). Agriculture is the backbone in the economy. It is the main source of employment and national income. More than 63% of the total population are engaged in these sectors (Report of the World Bank and NRB 2009). Agricultural sectors like fisheries, poultry, farming, and dairy exist in urban areas of Nepal. Dairy is one of the significant occupations. Milk is the best food for promoting the body growth. Buffalos and cows are mainly use for milk production. Milk is the first food of human life ands has remarkable combinations of food elements like protein, carbohydrate, minerals, and vitamins that promote body growth. Dairy also represents the basic agricultural industry for the people engaging in production of milk and milk product. Agro-based country like Nepal must focused on agro- based industry. Among the agro-based industry, Dairy sector plays a vital role .In Nepal, Dairy Development Corporation (DDC) is a Leader firm in Dairy industries.

Industry, business, trade and commerce development indicates the life state of the people of the country. For the rapid development of Nepal, it is essential to develop the industrial sector. And for the development of industrial sector, there should be adequate industrial infrastructure as well as appropriate technology and private sector can't alone result in economic development of the country. Thus, government can play a major role in establishing different kinds of public enterprises Public enterprises help many areas such as balanced regional development, pubic welfare to generate employment opportunities, export promotion etc.

"Public enterprises without a plan can achieve something a plan without public enterprises is likely to remain in papers" *(Hanson; 1993:347).*

Government has established various PEs in the different fields such as public utility, manufacturing enterprises, trading enterprises, financial enterprises, etc. Although, Nepal is a poor country, development based virtually in the hands of the foreign aids or policy. Among Nepalese enterprises, dairy development corporation (DDC) is one of the public concerned established to bring improvements in production, processing, preservations, sales and distribution of milk and milk production i.e. cheese, butter, ghee, yoghurt, etc

The whole population as well as the milk products user population of our country is increasing day by day. Therefore, their importance of milk and milk products has increased. The increasing trend of population is shown in Table: 1.1.

Table: 1.1

Growth of Population in 1911-2002

Year in B.S.	Population "000"	Growth Rate
1968	5639	-
1978	5574	-013
1988	5533	-0.07
1998	6284	1.16
2008	8473	2.3
2018	9413	1.65
2028	11556	2.07
2038	15023	2.66
2048	18491	2.08
2058	22700	2.20

Source: CBS (2002) Statistical Pocket Book, 2002.

The central Bureau of statistics has recorded that the number of people living in urban areas has increased to 13.2% in 2002 compared to 12.4%in1991. The demand of the agricultural products, including milk for consumption purpose had increased due to increase in population. And also urbanization made the demand for milk and milk products high. The farmers, who lived near the city, were supplying milk products, without consideration of nutrition and hygienic value, thereby affecting the health of the peoples.

Therefore, with the rising demand or market and to control the water mixing practice, government realizes to install the dairy program inside the country after 2009 B.S. As a result, dairy development commission was converts into Dairy Development Board in 2019 B.S. (1962 A.D.)

Before 2007 B.S., the environment was also not favorable to develop the industrial sector and the government had passed keeping the nation in political icons instance. From 2013B.S. the government started 5 Years development plans which are also running now and the government has been operating the development works according to these plans.

1.2 Concept of Cost Volume Profit Analysis

Individually ‘cost’ means price paid to acquire produce/ accomplish/ maintain anything, ‘volume’ a mass or quality of something or amount, and ‘profit’ means the ratio of such pecuniary gain to the amount of capital invested and analysis in resolution, separation or breaking into parts. In total CVP analysis is the effect on profit of changes in selling prices, services fees, cost, income tax rates and the organization’s mix of products and services. CVP analysis provides management with a comprehensive overview of the effect on the revenue and cost of all the kinds of short run financial changes. CVP analysis provides the manager with a powerful tool for identifying those courses of action that will or will not improve profitability. The entire gamult of profit planning is associated with CVP inter relationship. CVP analysis provides a sweeping overview of the effect on profit of all kinds of changes in sales, volume, expenses and product mix and sales price.

Usually the CVP analysis provides the answer to the following questions: *(Pandey; 1988:541)*

- What minimum levels of sales need to be achieve to avoid losses?
- What should be the sales level to earns a targeted profit?
- What will be the effect of Changes in prices, cost and volume on profit?
- How will profit be affected when sales mix is changed?
- What will be the new BEP under changes in cost, prices, volume and sales mix?

The CVP analysis is of immense utility management as it provides an insight into the effects and interrelationship of factors, which influence profit of the firm. It is with the help of CVP analysis that the finance executive is enabled to present facts and figures in accurate reports and easily understood charts to management for action.

1.3 Introduction of DDC

Dairy Development Corporation (DDC) was established in B.S. 2026 (1996) under the corporation Act, B.S. 2021(1964). Under the corporation are to provided guaranteed market and fair price to the rural milk producers and to supply hygienic pasteurized milk and others standard dairy products to the urban consumers. Prior to the establishment of the corporation a separate Dairy Development Board was constituted to carryout the task of dairy development in Nepal in wider scale. The dairy development activities in Nepal started in Tusal Village of Kavre district B.S.2009 (1952) on experimental basis with a small scale milk processing plant under the development of agriculture. In the year B.S. 2010/11, At the initiative of Dairy Development board, the Central Dairy plant was established and it started milk collection, processing and marketing activities from the year B.S. 2014/(1957).

Major objectives of DDC

- Provide a guaranteed market for milk to the rural farmers with fair price.
- Supply pasteurized milk and milk products to urban consumers.
- Develop organized milk collection system to meet increasing demand for pasteurized milk and milk products.
- Develop and organized marketing system for milk and milk products.

1.4 Statement of the Problems

Profits are planned and managed. And profit planning and control is a tool that can handle organizations present situation smoothly. So, saying success is not the matter of chance of profit does not just happen. Cost-Volume Profit Analysis, under the profit planning control, provides techniques of profit planning framework.

DDC has suffered losses year after year. The inconsistent sales revenues , low contribution margin having high fluctuating variables and fixed cost, low productivity of the DDC, compelled and excited me to find out the causes of such losses and thus, write my thesis of this topic.

In another side DDC generated profit from FY 2059/60, which is the giant leap of improvement as compared to the past continuous losses. But I see there great fluctuation in profit and losses every fiscal year. In FY2062/63, DDC suffered from loss of RS. 25541,921 and in FY2063/64, DDC enjoys profits Rs. 14702495 and then in FY2064/65, corporation get loss of RS 89790000. This research also deals and provides the reason for such fluctuation performance.

The problems faced while across going into the corporation are listed below:

- Low profit earning
- Less productivity of labor
- Great fluctuation in profit
- Inconsistent revenues
- Maximum Leakages

1.5 Objectives of the Study

The main objective of this study is to examine "Cost –Volume Profit analysis of DDC" to determine the relationship between cost, volume, and profit and profitability of the DDC.

The following sub-objectives have been set to achieve the main objectives.

- To analyze the profitability and sensitivity of DDC in relation to sales.
- To analyze the productivity of the labor by using different productivity ratios.
- To evaluate the variances between budgeted and actual achievement of the corporation.
- To analyze the cost volume profit of the corporation and its impact on its profit planning.

1.6 Significance of the Study

This research work is the study of the practice of CVP analysis of DDC. This study will be useful to various parties in various ways and those are stated below:

- It examines the applications of CVP analysis of the corporation.
- It provides necessary theoretical as well as contemporary situational conceptions to make appropriate decisions for DDC.
- It is also useful for interested parties, loan investor, foreign donors, suppliers etc.
- It may also help DDC to take corrective measures to the related department of the corporation.
- It provides literature to the researchers, who want to perform further research in this field.

1.7 Limitations of the Study

The effects of this research work have been made to present and analyze the facts clearly, truly and within the boundary. However, non-availability of FY2064/65 and FY2065/66 data, as it is on the auditing process, confined this research work towards the analysis of past five years (i.e. 2059/60 to FY2063/64).

To sum up, this study enlists the following limitations:

- Used secondary data is a serious limitation.
- Shortage of time and sources to collecting data.
- The data of FY2064/65 and FY 2065/66 were not available as it was in the auditing process.
- The study is based on secondary data (inclusion discussion and financial statement collected from company).
- This report has been confined to the data provided by the personnel of the company.
- It covers the CVP analysis of only five years (FY 2059/60 to 2063/64).

1.8 Organization of the Study

The study has been organized into five major chapters. The chapters were outlined below:

Chapter-I	Introduction
Chapter-II	Review of Literature
Chapter-III	Research Methodology
Chapter-IV	Presentation and Analysis of Data
Chapter-V	Summary, Conclusion and Recommendation

Chapter-I : Introduction

This chapter contained the brief introduction of the subject matter i.e. General Background of the Study, Brief Overview of Public Enterprises, Brief Overview of DDC, statement of the problem, Objectives of the study, significance of the study.

Chapter-II: Review of literature

This chapter dealt with the review of literature of related study .It contained conceptual review and major studies related with this research.

Chapter-III :Research Methodology

This chapter contained the research methodology used in this study. It included Research Design, Nature and sources of Data, Period covered, Data Processing Procedure, Financial and Statistical Tools used for the study.

Chapter-IV :Data Presentation and Analysis

Various data were gathered by from applying the different methods. The collected data as computed as required by the research objectives. In this chapter the different types of data were interpreted and analyzed with the help of various analytical tools and techniques followed by findings.

Chapter-V: Summary, Conclusion and Recommendation

This chapter covered Summary, Conclusion and Recommendation of this study.

CHAPTER-II

REVIEW OF LITERATURE

2.1 Conceptual Framework

CVP analysis plays a vital role in profit planning. CVP analysis segregated the total cost into two parts: fixed and variables costs. Up to a limit of production, fixed cost remains unchanged but variable cost increase an decreases with respect to the increment and decrement of volume of production. Therefore, in order to make profit, it is necessary to examine weather the capacity is fully utilized or not or if there is any part to reduce cost. Because minor changes in cost may result the high differences in profit whereas, the efficient use of reasons any reduces the cost and it may give the opportunity to make more profits.

CVP analysis is effective in respect of short - term planning. It enables to study the effect of business activities on the expenses. Understanding of the aforementioned relationship plays a considerable role in correct prospective business planning and budgeting. CVP analysis helps managers to see the effect of different strategies and decisions on business activities. With the results of the analysis managers will be able to answer the following:

- What should be the levels of sales to cover all expenses?
- What should be the volume of products enabling to get the required profit?
- How the increased business activities would effect precedes expenses and profit?
- And many other questions.

CVP analysis can be used for, the whole organization and its small units departments, sections and productions lines. CVP analysis studies the interrelation of units. During the analysis we estimate these interrelations and, therefore, the organization's margin of profit.

In a single product organization, when cost behavior is accurately explained by fixed variable framework, CVP analysis is undoubtedly a precise, valuable tool for decision making. Unfortunately, this scenario rarely reflects reality. Most organizations are multi product and ABC would indicate that cost behavior is generally more complex than a simple fixed- variable framework would suggest.

The constant sales mix concept underlying most textbook treatments of multi-product CVP assumes that fixed costs should be apportioned between products based on their shares of total weighted contribution margin.

This implicitly supposes that each fixed cost is incurred for the benefit of all products. The ABC methodology suggests that this assumption is unlikely to be appropriate when products consume differing levels of overhead resources. Using more detailed analysis of fixed costs between product lines, ‘direct’ break – even points for individual products can be calculated.

Accounts and mangers need to have to clear understanding of the assumptions underlying CVP models which they use for decisions making purpose and need to use the model which is most appropriate for the decisions at hand.

2.1.1 Assumptions of CVP Analysis

It is essential that anyone preparing or interpreting CVP information should be aware of the underlying assumption on which the information has been prepared. If these assumptions are not recognized, serious errors may result and incorrect conclusions may be drawn from the analysis. They are as follows: *(Drury; 2000:248-253).*

- A**ll other Variables Remain Constant**

It is assumed that all variables other than the particular one under consideration have remained constant throughout the analysis. In other words, it is assumed that volume is the only factor that will cause cost revenues to change. However, changes in other variables such as production efficiency, sales mix, price levels and production methods can have an important influence on sales revenues and costs. If significant changes in these other variables occur, the CVP analysis presentation will be incorrect.

- **Simple Products or Constant Sales Mix**

CVP analysis assumes that either a single product is sold or, if a range of products is sold, that sales will be in accordance with a predetermined sales mix. When a predetermined sales mix is used, it can depict in the CVP analysis by assuming average revenues and average variables costs for a gives sales mix.

BEP is not a unique number; it varies depending on the composition of the sales mix. Because the actual sales mix is different from the budget sales mix, the actual average unit contribution is different from that used in the budget BEP calculations.

Thus, the BEP and the expected profit or losses at various output levels will also change. Any CVP analysis must therefore be interpreted carefully if the initial product mix assumptions do not hold.

- **Complexity- Related Fixed Cost does not Change**

CVP analysis assumes that complexity related cost remain unchanged. Cooper and Kaplan illustrate that many so-called fixed cost vary not with the volume of items manufactured but the range of items produced (i.e. complexity of the production process). Complexity - related costs do not normally vary significant in the short run with the volume of production. If a change in volume does not alter the range of production then it is likely that complexity - relates fixed costs will not after but if volume stays constant and the range of items produced changes then support department fixed cost will eventually change because of the increase or decrease in product complexity.

CVP analysis assumption will e violated if a firms seek to enhance profitability by production proliferation, i.e. by introducing new variants of products based on short-term contribution margins. The CVP analysis will show that profits will increases a sales volume increase and fixed cost remains constant in the short term. The increased product diversity, however, will case complexity-related fixed cost to increase in future periods and there is a danger –which long- term profits may decline as result of products proliferation. The CVP analysis incorporate the fixed cost requires handling the diversity and complexity within the current product range, but the costs will remain fixed only if diversity and complexity are not increased further. Thus, CVP analysis will not capture the changes in complexity- relate arising from changes in the range of items produced.

- **Profits are calculated on a Variable Costing Basis**

The analysis assumes that the fixed costs incurred during the period are charged as an expense for that period. Therefore, variable profit calculations are assumed. If absorption-costing calculations are used, it is necessary to assume that production equals to sales for the analysis to predict Absorption costing profits. If this situation does not occur, the inventory levels will change and the fixed overheads allocated for the period will be different from the amount actually incurred during the period. Under Absorption Costing, only when production equals sales will e the amount of fixed overheads incurred are equals to the amount of fixed overheads charged as expenses.

- **Total Costs and the Total Revenues are Linear Functions of Output**

The analysis assumes that unit variable cost and selling price are constant. This assumption is only likely to be valid within the relevant range of production.

- **Analysis Applies to Relevant range only**

CVP analysis is appropriate only for decisions taken within the relevant production range and that it is incorrect to project costs and revenue figures beyond the relevant range.

- **Cost can be accurately divided into their Fixed Variable Elements**

CVP analysis assumes that costs can be accurately analyzed into their fixed and variable elements. Even though, separations of semi- variable costs into fixed and variable elements are extremely difficult in practice. Nevertheless, a reasonably accurate analysis is necessary, if CVP analysis relevant information for decision -making.

- **The Analysis Applies only to a short- term time horizon**

In the short term, the costs of providing a firm's operating capacity such as property taxes and the salaries to the senior managers are likely to be fixed relation to the change in activity. Decisions on the firms intended future potential level of operating capacity would determine the amount of capacity cost to be incurred. These decisions will have been made previously as part of the long term planning process.

Once these decisions will have been made, they cannot be easily reversed in short term. It takes time to significantly expand the capacity of plant machinery or reduce capacity. Furthermore, plant investment and abandonment decisions should not be based on short term fluctuations in demand within a particular year. Instead, they should be reviewed periodically a part of the long term planning process and decisions based on predictions of long run demand over several years. Thus, capacity costs will tend to be fixed in relation to changes in activity within short term periods such as one year. However, over long term period significant changes in volume or product complexity will causes fixed costs to change.

It is therefore, assumed that is the short term, some costs will be fixed and unaffected by changes in volume. In the short term, volume is the most important variable inflecting total revenue, costs and profits. For this reasons, volume is given special attention in the form of CVP analysis. However, in the long run, other variables besides, volume, will cause costs to change. Therefore, the long term analysis should incorporate other variables, besides volume and recognizes that fixed cost will increase or decrease in steps in response to changes in the explanatory variables.

2.1.2 Terms Used In CVP Analysis

Mostly used terms are as follows: *(Fago; 2003: 253-258).*

- **Variable Cost**

The cost, which varies according to the level of production or output, is called variable cost. It fluctuation in total amount but total to retain unchanged per units as production activity changed. Material cost, direct cost, etc are variables cost. There is a linear relationship between the volume and variable cost i.e., the cost increase or decrease as the volume increased or decreases.

- **Fixed Cost**

The cost, which remains unchanged to an entire range of production or out put, is called fixed cost. Thus, fixed cost is the cost, which remains constant in respect to the changes in the output within a relevant rage. The main characteristics of fixed costs are that it is fixed within a rage whereas in per unit cost, it will change. For example, rent, insurance, etc.

- **Semi- Variable Cost**

Semi variable cost is the cost, which remains fixed to a certain range of output and varies thereafter in accordance with the change inactivity. IN other words, the cost, which has characteristics of fixed and variable cost, is called Semi- variable cost. It is even called mixed cost. For example, Lighting, Indirect material. Indirect labor Cost of Overtime, Repair and maintenance, etc.

- **Step Fixed Cost**

It is the fixed cost, which remains constant up to certain level of capacity. After meeting the capacity, there is an increment in the fixed cost by certain amount. Regularly, the fixed cost will in increase up to the point, where the cost, meets its existing capacity.

- **Break Even Analysis**

Break Even Analysis is a logical extension of Marginal Costing. It is based on the same principle of classifying the operating expenses into fixed and variable. Now a same day, it has become a powerful instrument in the hands of policy makers to maximize profit.

The B/E analysis is a specific way of presenting and studying the inter- relationship between the cost volume and profit. It provides information to management in the most precise manner.

The B/E analysis established a relation between the revenues and cost with respect to the volume. It indicates the level of sales at which cost and revenue are in equilibrium. The equilibrium point is normally called BEP.

Break –Even Point (BEP)

The BEP can be defined as that point of sales at which the total revenue is equal to all cost. For BEP to occur, it is necessary that firm same variable and fixed cost. If all the cost of the firms is variable, no profit no loss or BEP would be at Zero sales volume. On the other hand, if all costs were fixed, the BEP would occur at a point where revenue is equal to total cost. The BEP can be computed in terms of units as well as Rupees.

$$\text{BEP (units)} = \frac{\text{Total Fixed Cost}}{\text{Unit Selling Price} - \text{Uni t variable Cost}}$$

$$\text{BEP (Rs)} = \frac{\text{Total Fixed Cost}}{1 - \frac{\text{Unit Variable Cost}}{\text{Unit Seling Price}}}$$

In order to understand the B/E analysis three concepts should be understood.

1. Contribution Margin
2. P/V Ratio
3. Margin of Safety

Contribution Margin

It is the difference between the sales and the marginal / variable cost of sales and it contribution towards fixed expenses and profit.

Contribution Margin = Selling-Variable Cost

For e.g.

Selling Price	Rs.25/-
Less: Variable cost per unit	<u>Rs.15</u>
Contribution margin	Rs.10

P/V ratio

It is an important tool in studying the profitability of a business. It establishes relationship between contribution and the sales value.

It van be also found the relationship between the change in the contribution and change in the sales. It is written in the form of percentage.

Example, in above case, if the fixed expenses is Rs. 100,000/- and sales unit is 20,000, the contribution will be Rs 20,000/- (20000×10), which is sufficient to meet fixed expenses and profit left is Rs. 100000/- . And if the output is 10000, then the contribution will be Rs. 100000(i.e. 10000×10), which is just sufficient to bear the fixed expenses. And, if the output is 5000 units, contribution will be Rs. 50000/- which is not sufficient to meet fixed expenses and the result is a loss of Rs.50000.

Thus, contribution will first go to meet fixed expenses and then to profit.

Margin of Safety

It is difference between the actual sales and the BEP sales. One of the assumptions of marginal costing is that the production or the output will coincide the sales. So, margin of safety is also the excess of production over BEP output. Sales or output above BEP is known as margin of safety because it gives some profit whereas at BEP only fixed expenses are recovered.

Margin of Safety = Actual Sales- BE Sales = $\frac{\text{Profit}}{\text{P/V Ratio}}$

For e. g.

If present sales is Rs.40, 0000 and BE sale is Rs. 300000, margin of safety (MOS) will be Rs 100000(i.e. Rs 400000- Rs 300000) or 25% (i.e.$\frac{100000}{400000} \times 100$)

2.1.3 Sensitivity CVP Analysis

Sensitivity of CVP analysis is the study of the CVP analysis in the different stages or in the different situation in which the related terms of CVP, cost (fixed and variable, volume and profit changes). If changes occur in one term, such as in cost (Variable and fixed cost independently), we studied its effect or changes, which may be positive or negative, on profit, on sales volume, on contribution margin, on selling price, etc. respectively. It helps t he company to maintain its original BEP in the change situation.

Small changes is one factor of CVP can change the BEP or profit, or in other words, BE or profit is influence in response to the change in selling price, variable cost and fixed cost. When changes are expected in selling price, in ratio of variable cost factors, or in the amount of fixed cost, an analysis of the cost-volume - profit relationship can determine the effect of such changes on period's profit and BEP.

2.1.4 Methods of Segregating Mixed and Semi Variable Costs

CVP analysis requires the segregation of all costs into fixed and variables. So, the semi-variable costs should also be segregated into variable accordingly. The segregation of the semi- variable cost done through one of the following methods: *(Maheswari; 2000: 162-165).*

- **Levels of Output Compared to Levels of Expenses Methods**

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

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

- **Range Method**

This method is similar to levels of output compared to level expenses except that only the highest and lowest points of output are considered out of various levels. This method is also called "High and Low Method".

Procedure:

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

Variable Rate = $\frac{\text{Difference in Cost "Y"}}{\text{Difference in Activity"X"}}$

Compute the Fixed Cost as:

Fixed Cost Portion= (Total Semi Variable Cost - Variable Cost)

➢ Degree of Variability Method (DOV)

In this method, the degree of variability is note for each of semi – variable expenses. Some may have 70% variability while others may have 30 % variability. The method is easy to apply but difficult is faced in determining the degree of variability.

➢ Scatter- graph Method

In this Method, the given data are plotted on graph paper and line of best fit is drawn whereas semi – variable expenses is plotted on the vertical axis(y- axis) and activity measure is plotted on the horizontal axis(X- axis).

Procedure:

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

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

➢ Least Square Method

One of the popular for CVP analysis is regression analysis. Regression analysis is a statistical mathematically, the average relationship between the dependent variable (Y) and the independent variable(X). The regression method does include all the observed data and attempts to find a line of best fit. To find the line of best fit, a technique called least –square method is used.

It is based on the mathematical techniques of fitting a education with the help of number of observations. The linear equation can be assumed as;

Y = a+bX and the various sub- equation shall be,

$\sum Y$ = na + b$\sum X$

$\sum XY$ = a$\sum X$+$\sum X^2$

Similarly, the equation can be fitted for any number of orders of degree depending upon the number of observation available and the accuracy desired.

Unit variable cost and fixed cost can be computed by using the following formula.

$$b = \frac{N\sum XY - \sum X \sum Y}{N\sum X^2 - (\sum X)^2}$$

$$a = \frac{N\sum Y - \sum X}{N}$$

Where,

Y= Total Cost

a = Fixed Cost

b= Unit variable Cost

N= No. of Series

X =Production Units

$\sum = Sum\ \ of$

2.1.5. Special Problems in CVP Analysis

CVP analysis is applied to individual products or parts of a business and to company as a whole. In the latter case, there are three special problems may be encountered: *(Drury; 2000: 263-268).*

- **The Activity Base**

When two or more products or activities are combined for BEP analysis, the activity base is usually in amount. Product units are used for single product. The activity base is must be in additive units using a common denominator of volume or output in multiple products. Therefore, for the company as a whole, net sales amount are usually the only satisfactory common denominator because manufacturing, selling and administrative activities are expressed in combinations.

- **The change in Inventory**

Normally, the budget changes in inventories (i.e. finished goods and work – in process) are immaterial in amount and thus maybe disregarded in CVP analysis. On the other hand, when the changes in budget inventory are significant: it should be included in analysis. Including the effect of inventory changes in CVP analysis requires subjective judgments about what management might do (about making inventory changes) at different volume and the conceptual precision is desired. Management considers two practical approaches or policies in inventory changes often used.

a. Disregarded the inventory changes
b. Include the inventory changes

- **The Non- Operating incomes and Expenses**

Non- operating income (gains) and expenses (losses) and extraordinary gains and losses, if material in amount, cause another problem in CVP analysis. The basic issue is weather they should be included or excluded. Extra- ordinary gains and losses are no- recurring and unusual: therefore, they should be excluded. Non operating incomes ad expenses are recurring but they are not related to ongoing operations. Management considers the policy may be to:

a. Included the non- operating incomes and expenses;
b. Excluded the non- operating incomes and expenses;

2.1.6. Utility of CVP or B/ E 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 profits. The utility of the break- even analysis lies in the following advantages: *(Brown & Howard; 1969: 353-355)*.

- It is simple basic device to understand accounting data.
- It is a useful diagnostic tool.
- It is provides basic information for further profit improvements studies.
- It is useful method for considering the risk implications of alternatives actions.

The breakeven analysis is a simple concept to comprehend and interpret the accounting data. Many business executives and others are unable to understand accounting data contained in financial statement and reports. When these data are presented through break- even charts, it becomes very easy to grasp and interpret them. However, the executives using break even analysis should remember the limitations of this device and should not attach too much value to it.

The break even analysis is a useful diagnostic tool. It indicates to management the causes of increasing break even point and falling profits. The analysis of these causes will reveal to management what actions should be taken. As a practical matter, knowledge of where the break even point lies can be quite useful to management in determining the need for action. However, an increasing break even point should not always be a matter of alarm to management. The important information to be analyzed is break even as a percentage of capacity. If the break even point as a percentage of capacity is increasing, it indicates unfavorable conditions. It is his kind of situation which needs immediate action. It is possible that due to plant expansion absolute break even point may increase, but capacity May be increase. This situation, where the break point as a percentage of capacity does not increase, is not unfavorable.

In the break even analysis, we compute BEP and P/V ratio prepare break even charts and P/V graphs and analyze and report the effect of changing factors on profits. These whole set of information is important to evaluate the reasonableness and usefulness of profits plans and other budgets and forecasts prepare by management. The break eve analysis, thus, provides the basic information for profit improvements studies and it is a useful starting point for detailed investigations.

The desirability of an action should be considered on the basis of its profit as well as risks. If profit alone is considered, a firm may commit to a risky action. The break-even analysis, to some extent, is a useful method for considering the risk implications of alternative actions. Considering the effects of the alternative actions on the break-even point can approach the problem of risk evaluation. From one alternative, a firm may expect higher profit and also a higher break-even point, while another alternative maybe produce comparatively lower profit but also entail a lower, break-even point. In taking a decision, the firm should not only consider the profits expected form the alternative but also the probability of reaching the BEP. If the probability of achieving the BEP sales is low, the firms should prefer the second alternative where the BEP will be reached earlier.

2.1.7 Limitations of CVP or B/E Analysis

The BEP or CVP analysis is a simple and useful concept. But it is based on certain assumptions, which have been discussed earlier. These assumptions limit the utility and general applicability of the B/E 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: *(Dangol; 1997:545-546).*

1. It is difficult to separate costs into fixed and variable components
2. It is not correct to assume that the total fixed cost would remain unchanged over the entire range of volume
3. The assumption of constant selling price and unit variable cost is not valid
4. The B/E analysis is a short-term concept and has a limited use in long rang planning
5. The B/E analysis is a static tool

2.1.8 Approaches of Calculating Break-Even Point

There are two approaches to calculating the break-even point for a firm: the contribution-margin approach and the equation approach: *(Dangol;1997:557-559).*

1. The Contribution-Margin Approach

a. Based on Amount Profit Contributed

This approach is based on the concept of the contribution margin, or the amount that each unit contributes toward covering fixed expenses and generating profit. Mathematically, the contribution margin per unit is calculated as follows:

Contribution Margin = Selling Price – Variable Expenses per Unit

b. Break-even is where Fixed Expenses are Covered

If the contribution margin is the amount the each unit contributes toward covering the fixed expenses, the break-even point in unit, or the point where the fixed expenses are covered can be found in the following manner:

Break-even Sales (in Units) = $\frac{\text{Fixed Expenses}}{\text{Contribution margin per Unit}}$

c. Break- even in Dollars

To find the break-even point in dollars simply multiply the break-even point in unit by the selling price. Alternatively, one can use the contribution margin ratio, which is the contribution margin expressed as a percentage of the selling price. Thus:

Break-even Sales (in Dollars) = $\frac{\text{Fixed Expenses}}{\text{Contribution Margin Ratio}}$

2. The Equation Approach

Sales- total Variable Expenses – Total Fixed Expenses = Profit

Break-Even Sales (in dollars) = Total Variable Expenses + Total Fixed Expenses

Sales (in units) = $\frac{\text{Fixed Expenses+Target Net Income}}{\text{Contribution Margin per Unit}}$

Sales (in Dollars) = Total variable Exp. + Total Fixed Exp. + Target Net Profit

2.1.9 CVP Analysis with Multiple Products

1. Multiple Products Require Weighting Sale Mix

Most firms have more than one product line, and CVP analysis may be adapted for these firms. The same basic equations are used; however, the sales mix must weight the contribution margin. The sales mix is the number of units sold of a given product relative to the total units sold by the firm (*Bajracharya, Ojha, Sharma & Goet; 2005:260).*

Example: If a company sells 8000 units of product A and 2000 units of product B, the sales mix is 80% A and 20% B.

2. Weighted Average Contribution Really a Market Basket

A weighted average unit contribution margin is calculated by multiplying a product's contribution margin by its sales mix percentage, and then summing the results for individual products. The result is often dividend into fixed expenses (as before) to arrive at the break-even point in units. In this case, however the units are really a market basket of the various goods in the sales mix percentage *(Bajracharya, Ojha,Sharma & Goet; 2005:260).*

3. Final Step

As a final step, the sales mix percentage is multiplied by the number of "units" to calculate the individual product sales to break even. It should be evident that a change in a firm's sales mix will alter the company's break\even point *(Bajracharya, Ojha,Sharma & Goet; 2005:260).*

2.1.10 CVP Relationships and the Income Statement

Traditional Includes Cost-of Goods Sold

The traditional income statement for a manufacturer includes a cost-of goods-sold figure that combines variable costs and fixed manufacturing overhead. The statement's format does not group costs by behavior but rather by function, thus making CVP analysis difficult.

Contribution Highlights Cost Behavior

The contribution income statement is presented in a format that highlights cost behavior. Variable expenses are subtracted form sales to produce a total contribution margin. Next fixed expenses are subtracted the yield the period's net income. This format is used for variable costing.

2.1.11 Cost Structure and Operating Leverage

Cost structure refers to the relative proportion of fixed and variable existing in an organization. An automated manufacturing plant would have a high proportion of fixed costs whereas a direct labor-intensive plant would have a high proportion of variable costs. Any organization has some choice as to its cost structure.

A company's cost structure has a significant effect on the way in which profits fluctuate in response to changes in sales volume. The greater the proportion of fixed costs in a firm's structure, the greater will be the impact on profit from a given percentage change in sales revenue. This results from the fact that firm with relatively higher fixed costs (and relatively lower variable costs) will have a higher contribution margin ratio.

Operating leverage is a measure of how sensitive net income is to percentage changes in sales. Operating leverage is greatest in companies, which have a high proportion of fixed costs relative to variable costs. A firm with high fixed costs and low variable costs has high operating leverage; the ability to highly increase net income from an increase is sales revenue. In other words, after the break-even point has been reached, a larger amount of contribution margin will fall to the bottom line in a high fixed cost structure than if the cost structure had been comprised mostly of continuing high variable costs, which continue to eat away at net income after the break-even point is reached. Of course, the risk is also greater because if the break-even point is not reached, losses will be greater in the firm with high operating leverage.

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

2.2 Review of Thesis

Many studies have been conducted in the profit planning in the context of Nepalese business firms. But in the most, CVP analysis has given less priority than others or it can be said that only few studies are mainly focused on CVP analysis. And whatever few researchers have been made, are not also in depth. Mostly CVP analysis is done only under the heading of profit planning and control in Nepal.

Few researchers have been reviewed under the topic of profit planning and control in Nepal.

Badu, (1996) tried to point out some features and problems of *"Profit Planning in Nepalese Manufacturing Public Enterprises and the Selected Dairy Development Corporation (DDC)"* as a base for study.

The main objectives of his research work were:

a. To analyze the various functional budgets adopted in those enterprises.
b. To examine the capacity utilization of DDC
c. To assess the financial performance of DDC using BEP analysis

His research covered the time period of five year from 2049/50 to 2053/54. Research methodology was mostly through secondary procedure and only for some information, primary data were used.

Findings Produced:

1. DDC has practiced short term rather than long term planning
2. Lack of segregation of cost into fixed and variable
3. DDC has problem of maintaining the quality of the products.
4. No proper management to supply milk in the urban areas because of the difficulties in collecting surplus milk from rural market.
5. Financial position of the DDC is not good.

Dumre, (1997) has submitted the thesis on the topic *"Profit Planning Practice in Nepalese Public Enterprise: A Case Study of DDC".* The study was mainly concerned with the appraisal DDC and examines that in what extent, the Company is applying PPC system. The main Objectives of his research work were:

1. To analyze the sales Revenue trend of DDC.
2. To analyze the various functional budgets adopted by DDC.
3. To analyze the production function overhead expenses and other reasonable activities of DDC.

Findings Produced:

1. DDC has not been clearly defined its main objectives in annual goal or target.
2. The production plan depends upon sales plan but in case of DDC, the production plan is the basic plan of sales plan as supply side is given more importance.
3. The reasons of failure to raise profit in Nepalese manufacturing PEs are lack of knowledge about the market situation and lack of systematic planning.
4. Costing is done by traditional method and there is no segregation of cost into fixed and variable.
5. No proper planning for cost control mechanism and performance reporting.
6. Lack of budgeting experts, skilled planners and entrepreneurship. Planning department has no adequate authority to decide and new ideas to formulate various plans.
7. Commercial performance of DDC is poor. So, DDC can't afford to finance into research and increase plant capacity by internal fund.

Aryal, (2000) has submitted a thesis on *"Profit Planning of Manufacturing Enterprises: A Case Study of DDC"*. The study mainly focused on the appraisal of DDC and examined that in what extent the corporation is applying with PPC. The main Objectives of his research work were:

1. To analyze the sales Revenue trend of DDC.
2. To analyze the various functional budgets adopted by DDC.
3. To analyze the production function overhead expenses and other reasonable activities of DDC.
4. To analyze Variance and ratio analysis of DDC.

Findings Produced:

1. There is substantial gap between sales target and achievement of each year
2. Regression line about sales of DDC indicates a positive trend
3. DDC has not satisfactorily achieved its specific goals. Following are the main causes:
   a. Under capitalization
   b. Over staffing
   c. Not fully autonomy
   d. Corruption
4. DDC shows the following strengths and weaknesses:
   a. STRENGTHS:- No problems of Sales
      - Foreign Donors
      - Experienced Staffs
      - Local Milk
      - High Quality Product
   b. WEAKNESSES: Political Jurisdiction
      - Competition with other private diary
      - Lack of skilled manpower
      - No sufficient stock/sales in summer season
      - Autonomy is a bank paper.

Thapa, (2000) has submitted thesis on the topic *"Problems of Profit Planning in Manufacturing Public Enterprises: A Comparative Study of DDC and Sita Ram Dairy"*. He has tried to:

Dig out some features and problems of profit planning in the context of Nepalese manufacturing enterprises.

Findings Produced:

1. DDC has concentrated its whole efforts on the survival of the company
2. Employees are not more careful of their duties sin DDC comparatively with SRD.
3. Sales figures (target and achievement) of SRD are more in consistent than of DDC
4. SRD has highly been successful to maintain co-ordination than DDC
5. Both companies have positive correlation between actual and target sales in both industries.
6. DDC has been producing 11 types of products and SRD has been producing only 3 types of products.
7. Both companies have not proposed PPC except sales and production plan
8. DDC and SRD have been suffering from operating losses for many years. The main causes are low contribution margin ratio, high fixed cost and under utilization of capacity.
9. Both companies pricing methods are cost plus pricing and standard cost pricing.

Kharel, (2003) has submitted thesis on the topic "*Comprehensive Budgeting Process in Public Corporation in Nepal: A Case STUDY of DDC*". He had tried to examine profit Planning and control system applied by DDC by using statistical tools like percentage, mean, standard deviation, variation, correlation and financial tools like variance analysis, CVP analysis have been used to analyze the data.

Main objectives are as follows:

1. To analyze the functional budgets on sales and production sector of the DDC.
2. To analyze the various accounting ratios, measures the profitability and efficiency of the DDC.

3. To analyze the budget target and its achievement along with reason of deviation, if any.

Findings Produced:

1. DDC has planned only short term or for coming fiscal period
2. DDC had not separate planning department and planning experts.
3. DDC has not collected all milk offered by the farmers. It has not been able to grant the loan to the farmer's requirement.
4. The government interferes to the price of raw milk and milk products. The Board of DDC lies as a showpiece.
5. DDC has not applied any inventory policy. The inventory has increasing trend.
6. The gap between actual production and actual sales are high
7. The actual sales are lower than BEP sales
8. DDC has suffering the political pressure on employee's selection. Almost employees are appointed by the government directly rather than evaluation of candidate's ability.

Adhikari, (2004) has submitted on the topic, *"Profit Planning in Manufacturing Enterprises: A Case Study of DDC"*. The following are the specific objectives of his study.

a. To analyze, the functional budgets on sales and production sector of the DDC.
b. To analyze, various accounting ratios, measure the profitability and efficiency of the DDC.
c. To analyze the budget target and its achievement along with the reasons of deviations, if any.

Findings Produced:

1. DDC has practiced short-term planning rather than long –term planning.
2. Production and sales of DDC is increasing annually although the growing rate is fluctuated.
3. DDC has no proper practice in segregating into fixed and variable.
4. Most of the budgeted figures are higher than actual figures

5. DDC has prepared direct labor budget only based on technical and administration. It has not prepared according to time and rate.
6. Capacity utilization is very high but the productivity ratio is low
7. CVP analysis shows that DDC is operating below BEP sales.
8. Timely accounting and auditing works are not maintained
9. Financial statement and accounting system are out of the financial rules.

Namdak, (2005) has submitted thesis on the topic "*Cost-Volume-Profit Analysis of Dairy Development Corporation*". The following are the specific objectives of his study.

a. To analyze, profitability and sensitivity of DDC in relation to sales.
b. To analyze the relationship between cost volume and profit as a tool of budgeting.
c. To analyze the productivity of labor along with different productivity ratios.

Findings Produced:

1. DDC has not been practicing CVP analysis and no method adopted segregate fixed and variable cost.
2. DDC hasn't been segregating fixed and variable cost
3. DDC has practiced short term planning rather than long term planning.
4. DDC has low contribution margin ratio
5. Corporation has high fixed cost
6. Low productivity of labor has been shown
7. DDC has no effective inventory policy
8. Over utilization of capacity of machines resulted high repaired and maintenance cost
9. Very low profitability in relation to sales.

Dhakal, (2006), has conducted research work on *"Cost Volume Profit Analysis of Dairy Development Corporation"*. Main objectives are:

This study concerned to examine the practice of CVP analysis & its effectiveness in DDC. The time period covered by this research was five years.

Findings

- DDC hasn't been segregating fixed and variable cost, care has been taken in this research to differentiate fixed cost and variable cost with help of degree of variability method.
- DDC hasn't been practicing CVP analysis till now and there is no method adopted to segregate fixed and variable cost.
- DDC has low contribution margin ratio in all the five year under study.
- DDC has high wages & either availability of manpower is more than requirement or inefficiency of workers resulting in low productivity of labor.

Rijal, (2007), has conducted a research on *"Cost Volume Profit Analysis Tools to Measure Effectiveness of Profit Planning and Control; A Case Study of NEBICO Private Limited."*

He has centered his study to examine CVP analysis as a toll in manufacturing industry and to analyze the CVP and its impact in profit planning. It covers five years financial statement.

The major finding are as follows:

- The company's variable cost is in proportion than fixed cost in total cost amount, which contribute for lower contribution margin.
- The company has high fixed cost (i.e. salary and wages, technical and computer fees, depreciation, interest, provident fund and subsides)
- Company has no any plan to reduce cost. There is lack of effective cost control programs or techniques.
- The company has no effective inventory policy. The inventory management, raw material handling and controlling system are not efficient an effective.
- The board of directors is the main authority in price fixing and it directly interferes to price of biscuit and confectionary products.
- Nebico Pvt. Ltd. has not proper practice of segregating the costs into fixed and variable or controllable and non controllable.

- There is no proper co-ordination among production, administration, distribution, inventory and sales department.
- Nebico has not utilized its capacity.

Shrestha (2008), has conducted a research entitled "*Cost, Volume And Profit Analysis Of Commercial Bank: A Case Study Of Himalayan Bank Limited".*

This study concerned to examine the practice of CVP analysis & its effectiveness in Commercial Bank ,in this study the secondary data had been used mostly and related other information had collected by informal interview for segregating cost, Cost analysis, contribution margin analysis, P/V ratio analysis & Break Even analysis. The time period Covered by this Research was six years from FY 2061/62. The major findings are as follows:

- CVP analysis has not practiced yet.
- There is no Practice of segregating cost into fixed and variable. The costs are roughly classified and that classification is not scientific and appropriate.
- All the level of management is not involved in profit planning and decision making of the Bank.
- There is no complete and comprehensive budgeting system.
- Lack of the system of SWOT analysis. Liberalized policy of Government, skill manpower, good management team, use of computer technology etc. are strength of Bank where as unable to provide service in rural area, market competition, conflict in Nation, Industries and Business closed down are weakness and threat.

Sijakhwo, (2008), has conducted a research entitled "*Study on Application of Cost-Volume-Profit Analysis as a Management Tool in Bhaktapur Craft Paper Ltd*".

This study concerned to examine and study the practice of management accounting tools in the Company. This study is based on secondary data only and accuracy of this study is based on true response and the data available from the company. The time period Covered by this Research was seven years from FY 2056/57.

Findings:

- Different types of management accounting tools, which are taught in the colleges, are not found applied by the Company.
- There is no Practice of segregating cost into fixed and variable by using statistical technique i.e. least square method.
- Proper estimation is not used while making projected or budgeted costs, profit and volume of the company
- Mixed costs or semi-variable costs were segregated by using least square method.

Pradhan, (2009), has conducted a research entitled *"Cost Volume Profit Analysis of Public Enterprises of Nepal (A comparative analysis between Nepal Telecom and Nepal Electricity Authority).* The following are the specific objectives of his study.

a. To analyze, profitability and sensitivity of DDC in relation to sales.
b. To analyze the relationship between cost volume and profit as a tool of budgeting.
c. To analyze the productivity of labor along with different productivity ratios.

Findings:

- Segregation of fixed and variable cost is ignored by both enterprises. Cost volume profit analysis is not plasticizing by these enterprises no any method has been adopted to segregate to segregate cost into fixed or variable.
- Actual operating income of the NTC is increasing in fluctuation of trend.
- Variable cost of NTC is very less compare to its fixed cost and contribution margin ratio of NTC is very high. But NEA has variable cost and its contribution margin ratio is less.
- NTC is running in profit but NEA is suffering from less. No any systematic plans have been implemented for preventing the loss and improve profit of these enterprises.
- Fixed cost of NTC is high in the comparison to variable cost. Employee cost and administration expenses are high. In NEA fixed cost like interest and depreciation are high. Long term loan in NEA are the main cause in increase interest.

- High PVC ratio of NTC reduced the break even level of the company where as NEA has less PV ratio and BEP sales are more. As a result NTC is earning profit but NEA is suffering loss.

Adhikari, (2009), has conducted a research entitled "*Cost - Volume - Profit Analysis of "Nepal Lube Oil Limited".* This study concerned to examine the practice of CVP analysis & its effectiveness in company, in this study the secondary data had been used mostly and related other information had collected by informal interview for segregating cost, Cost analysis, contribution margin analysis, P/V ratio analysis & Break Even analysis. The time period Covered by this Research was seven years from FY 2056/57.

Findings

- CVP analysis has not practiced yet.
- There is no Practice of segregating cost into fixed and variable. The costs are roughly classified and that classification is not scientific and appropriate.
- There is no complete and comprehensive budgeting system.
- As Nepal is proceeding towards globalization and net membership of WTO, companies are recommended to apply management accounting tools to fit with the global environment.

Research Gap and Justifications

There is a gap between the present research and the previous researches.

The previous research study dealt with profit planning and control, as an aggregate. And, mostly, all the researches applied are mostly similar-same financial tools, statistical tools and also results and recommendations also resembles very much.

Since DDC has been incurring losses year after year in-depth analysis should be done to find out the major causes of such losses. Broad profit planning and control techniques would not be effective to dig out the real causes.

So, CVP analysis, as being the major tool to find out the profitability of the short-term tactical plan, that's why, this study has been performed. In fact, it is a kind of full fledged research work.

So, this study paper is designed to highlight the major causes of continuous losses recent improvement's reasons and high fluctuation and in profit and loss every year, which remained different from previous researches.

CHAPTER – III
RESEARCH METHODOLOGY

3.1 Research Design

Research design provides the overall framework or plan for the activities to be undertaken during the research study. Since, this study revolves around the relationship between cost, volume and profit, intensive analysis of historical and descriptive research design is used to analyze the performance of past five years from FY 2059/60 to 2063/64. To fulfill the objectives of this study, primary and secondary data are used. It also focuses on the affect on profit to change in volume and cost.

3.2 Sources of Data

The source of data is both primary and secondary collected from the central office of DDC. The primary data are collected through discussion with the concern authority. The secondary data are taken from annual reports, auditor's reports, balance sheet and profit and loss accounts, cost sheets, and unpublished previous thesis relating with the DDC and other published data, etc.

3.3 Population and Sample

DDC is taken as population here. CVP analysis focused wholly on DDC and not centered to particular branch of DDC or particular product. Hence, there is no difference between sample and population in this case.

3.4 Data Collection and Analysis

"Collecting data is the connecting link to the world of reality for the researcher" *(Wolf and Pant; 2005:197)*. Data are collected from the concerning the differentiation of fixed and variable costs and other related elements of the P/L a/c from the concerned authority of Central office of DDC. And since, they are not using CVP analysis, a thorough discussion with them provide a legitimate estimation of fixed and variable cost.

Secondary data are collected from annual reports, Sinhabalokan, auditor's report, balance sheet and P/L a/c, cost sheets and other thesis concerned mostly with the DDC.

The analysis of data are done by using different tools such as, averages, percentages, and all the CVP related ratios are used to find out the relationship among the three elements- cost, volume and profits. All the findings are presented in categorized, systematic, graphical and tabulated form.

3.5 Statistical Tools

Collected data were analyzed using accounting, statistical and mathematical tools. Tables, charts and graphs are demonstrated to make the report more comprehensive and striking. The accounting tools used are: contribution margin, break-even point, etc. The statistical tools used are: average, standard deviation, correlation etc. and the mathematical tools used are: percentage, mean and difference, etc.

Arithmetic Mean $(\bar{X})$

Arithmetic mean is a given set of observation is their sum divided by the number of observation. In such case, all items are equally important. It depicts the characteristic of the whole group. It is an envoy of the entire mass of homogeneous data. Generally, the average value lies somewhere in between the extremes i.e. the largest and the smallest items. It is calculate as follows:

Arithmetic Mean(x) = Mean $(\bar{X})$ = $\frac{X_1+X_2+X_3}{n}$

Mean $(\bar{X})$ = $\frac{X_1+X_2+X_3 \ldots\ldots\ldots\ldots X_n}{n}$

Where,

ΣX = Sum of the sizes of items

$(\bar{X})$ = Mean

N = Number of items

Standard Deviation (σ)

Karl Pearson first introduced the concept of standard deviation in 1983. Standard deviation is the positive square root of the arithmetic average of the squares of all deviation measured from the arithmetic overage of the series. The standard deviation measures the absolute dispersion of a distribution. The greater the amount of dispersion the greater the greater the amount of dispersion the greater the standard deviation i.e. greater will be the magnitude of the values from their mean. A small standard deviation means a high degree of uniformity of the observation as well as homogeneity of a serves.

Standard deviation is denoting by a Greek letter 'σ' (sigma) and is calculating as follows:

$$\text{Standard deviation (S.D.)}\ (\sigma) = \sqrt{\frac{\sum(\mathrm{Xn}-\bar{\mathrm{X}})^2}{\mathrm{n}-1}}$$

Where,

$\bar{X}$ =The average (mean)

X_n = the individual observation

n = Total number of observation

Correlation Coefficient

The correlation analysis is the technique used to measure the closeness of the relationship between the variables. It helps is in determining the degree of relationship between two or more variables. It describes not only the magnitude of correlation but also its direction. The coefficient of correlation is a number, which indicates to what extent two variables, are relate with each other and to what extent variations is one leads to the variation in the other.

$$\text{Simple Correlation Coefficient (r)} = \frac{\mathrm{N}\sum \mathrm{x_1x_2} - (\sum \mathrm{x_1})(\sum \mathrm{x_2})}{\sqrt{\mathrm{N}\sum \mathrm{X_1^2} - (\sum \mathrm{x_1})^2}\sqrt{\mathrm{N}\sum \mathrm{X_2^2} - (\sum \mathrm{x_2})^2}}$$

Correlation may be positive or negative which lies between ± 1. Simple correlation between interest rate on deposit and deposit amount interest rate on lending and credit or lending amount and is compute in this thesis. The correlation between interest rate on deposit and deposit amount is positive. Interest rate on lending and lending amount is negative when inflation increases, interest rate also increases in same direction and vice versa. For our study, following reference is used.

- Correlation may be positive or negative and ranges from -1 to +1 when r = +1 there is positive or negative and ranges when r = 1 there is prefect negative.
- Correlation, when r =0, there is no correlation and when r < 0.5 then there is low degree of correlation.
- When 'r' ties between 0.7 to 0.999 (or -0.7 to -0.999) there is high degree of positive or negative correlation.
- When 'r' lies between 0.5 to 0.699, there is a moderate degree of correlation.

CHAPTER - IV
PRESENTATION AND ANALYSIS OF DATA

Profit planning and control helps in facilitating effective performance of management systems. It is the ultimate objective of the management to maximize profit over the long-term, consistent with its social responsibility. In order to make profit it is necessary to examine whether the capacity is utilized properly or not or if there is any part to reduce cost because minor changes in cost may result high difference in profit, whereas the efficient use of resources may reduce the cost and it may give opportunity of more profit and CVP analysis can be the most important technique to utilize the cost in effective and efficient way. CVP analysis is a way to quickly answer a number of important questions about the profitability of a company's products or services or company as a whole.

There is high demand of cheaper goods in Nepalese market. To produce cheaper goods, maintaining the profit, CVP relation of the firm should be properly analyzed. There are only two possible ways to get higher profit; one is to increase the price and the other is to reduce the cost of production. Increasing the price of the product would reduce the demand, which eventually reduces the profit. So, increasing the price has long-term and multiplying effects. The second alternative is to make possible reduction in the cost. This is determined by the CVP analysis. It finds out the ways to reduce the cost and increase the profit. CVP analysis deals with the relationship of cost, volume and profit and also helps in utilizing the resources in a better way to get the maximum return.

So, taking into account of these reasons, this study mainly focuses on the CVP analysis of the DDC. This chapter presents the data, analyzes and interprets the data collected. The data are presented in a systematic manner and presented and tabulated in meaningful ways.

4.1 Sales Plan of DDC

The first step in development budgeting process of an organization begins with the preparation of sales budget. The sales planning is a necessary component of PPC because:

a. It provides to the basic management decisions, about marketing and,
b. Based on those decisions, it is an organized approach for developing a comprehensive sales plan.

If the sales plan is unrealistic, most of the other portions of the overall plan also will be unrealistic.

DDC is the market leader in the dairy industry. Now after the establishment of the dairy in private sector, DDC is gradually losing its market share. DDC produces large varieties of product such as pouch milk, skimmed milk, milk powder, curd, ghee, butter, cheese, different varieties of Ice-creams, paneer etc.

Table: 4.1
Sales Description
From 2059/60-2063/64

(Rs. In ‘000’)

Products	2059/60	2060/61	2061/62	2062/63	2063/64
Milk	1301,552	1244930	1300938	1253314	1332881
Butter	50,673	44220	49481	32167	40991
Ghee	155,293	141605	137685	139699	170144
Cheese	34,382	36590	35859	35433	37466
Curd	36,150	39678	37174	46219	63073
Ice-Cream	3,978	5714	6423	6330	8727
Cream	1,778	2294	1844	1356	1476
Paneer	11,109	12850	10315	10966	13546
Lassi	29	19	8	10	31
Rasbari	960	4193	4128	4451	4618
Lalmohan	-	1205	2129	3007	4258
Pedaa	-	2498	2620	2739	2847
Gudpak	-	-	313	186	35
Bay	-	-	3	118	-
Ladykeni	-	-	138	239	-
Skimmed Milk Powder	-	-	120	107	-
Mohi	-	-	351	-	-
Balushahi	-	-	136	-	-
Total	1,595,907	1535810	1589663	1536341	1680354

Source: Annual Report of DDC 2059/60 – 2063/64

The table 4.1 shows the sales trend on yearly basis of different products produced by the DDC.

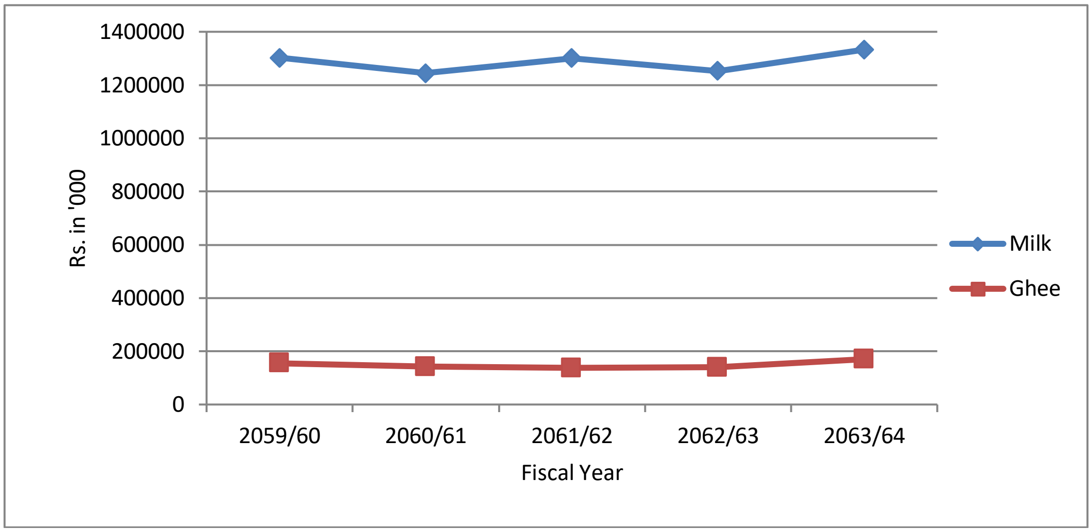
Table: 4.2
Milk and Ghee's Percentage to Overall Sales

(Rs. In '000')

Particular	2059/60	2060/61	2061/62	2062/63	2063/64
Milk	13,01,552	12,44,930	13,00,938	12,53,314	13,32,881
Ghee	1,55,223	1,41,605	1,37,685	1,39,699	1,70,144
Total	14,56,845	13,86,535	14,38,623	13,93,013	15,03,025
Sales	15,95,907	15,35,810	15,89,663	15,36,341	16,80,354
Percentage	91.29%	90.28%	90.50%	90.67%	89.45%

Source : Table 4.1

Figure: 4.1
Contribution of Milk and Ghee to Overall Sales



Milk and Ghee constitutes almost 90% of total sales revenue in each year. Milk constitutes 81.56% in F/Y 2059/60, 81.06% in F/Y 2060/61, 81.84% in F/Y 2061/62, 81.58% in F/Y 2062/63 and 79.32% in F/Y 2063/64 and Ghee constitutes 9.73% in F/Y 2059/60, 9.22% in F/Y 2060/61, 8.66% in F/Y 2061/62, 9.09% in F/Y 2062/63 and 10.13% in F/Y 2063/64.

Milk, being the dominant product, although revenue generated from it is increasing, overall percentage of milk to total sales revenue are towards constant in few fiscal years and slowly decreasing in F/Y 2063/64 to 79.32% from 81.58% in F/Y 2062/63.
And Ghee's demand is increasing and its contribution to sales revenue is increasing. This seems like Ghee will be the major contributor to sales revenue in the coming years too along with milk. Other products like cheese, butter, curd, Ice Cream, etc. constitute only 10% to the total sales revenues.

The following table 4.3 presents the budgeted and actual sales achievement from the fiscal year 2059/60 to 2063/64.

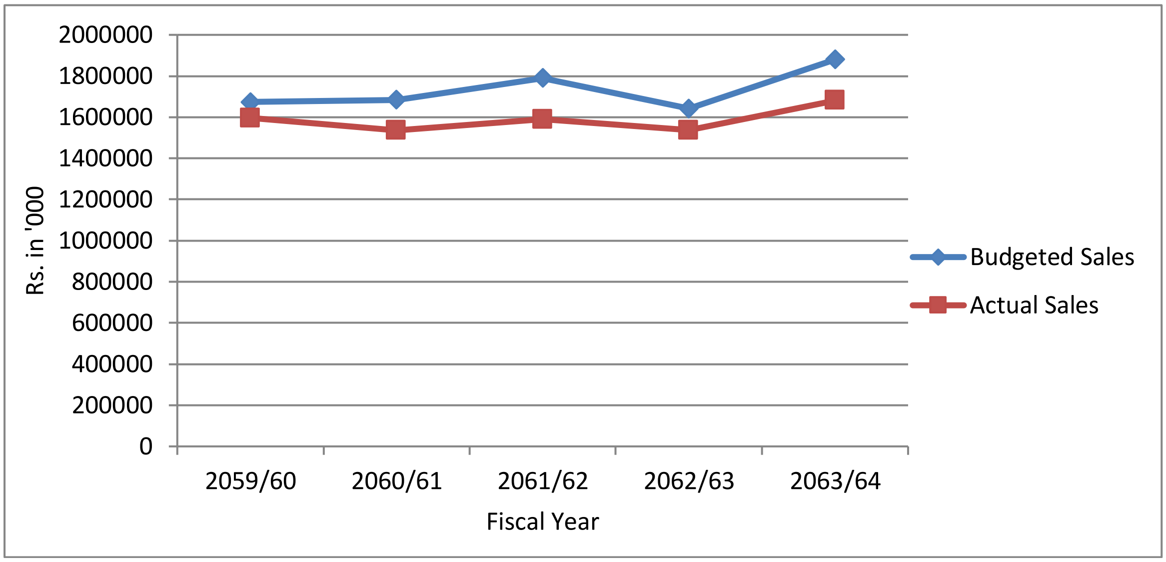
Table: 4.3
Budgeted Sales and Actual Sales Achievements

(Rs In Million)

Year	Budgeted Sales	Actual Sales	Achievement
2059/60	16,72,683	15,95,907	95.41%
2060/61	16,84,002	15,35,810	91.20%
2061/62	17,90,363	15,89,663	88.79%
2062/63	16,41,916	15,36,341	93.57%
2063/64	18,79,800	16,80,354	89.38%

Source: DDC Annual Report 2059/60-2063/64

Figure: 4.2
Budgeted Sales and Actual Sales Achievements



The above table 4.3and figure 4.2 shows the comparison between the budgeted annual sales revenue and actual sales revenue of DDC.
The budgeted and actual sales are in increasing trend, however, the percentages of increase is in fluctuating. The difference in budgeted sales and actual sales is not more than 10%. The trend shows that the achievements of actual sales towards budgeted sales are increasing.

The following table shows mean, standard deviation with co-efficient of variation and correlation co-efficient to analyze the relationship between the actual sales with budgeted sales. Regression analysis is not only analysis the relationship between both variables but also predicts the future actual sales from the regression equation.

Table: 4.4
Calculation of Different Statistical Tools

	Budgeted Sales (X)	Actual Sales (Y)
Mean $\overline{X}$, $\overline{Y}$	1733,753	1587615
Standard Deviation (σ)	107351.89	52889
Co-efficient of Variation (C.V.)	6.19%	3.33%
Correlation Co-efficient (r)	0.8944	
Probable Error of Correlation (P.E.(r))	0.0954	

Source: Appendix-7

The above table 4.4 shows the coefficient of variation of budgeted and actual sales. The distribution with smaller C.V. is considered to be more homogeneous or less variable or uniformly distributed. And in this calculation, budgeted sales are more homogeneous or less variable than actual annual sales, which indicated the low efficiency of planning department. The actual sales were more heterogeneous or with 3.33% C.V. more variable than budgeted sales having 6.19% C.V.

The widely- used statistical tool 'Correlation of Co-efficient' has been used to analyze the degree of relationship between the budgeted and actual sales. "Karl Pearson's Correlation Co-efficient" is the most widely used in practice for calculating correlation coefficient between the two variables, X and Y, and is usually denoted by 'r'.

For calculating 'r' budgeted sales are denoted by X (independent Variables) and actual sales are denoted by Y (dependent Variables). It is assumed that there will be linear relationship between budgeted sales and actual sales.

The probable error (P.E.) of the correlation Co-efficient (r) is an old measure of ascertaining the reliability of the value of sample Pearson co-efficient of correlation. It is used to test whether the calculated value of sample correlation co-efficient is significant or not. If

a. r < P.E. (r), then the value of r is not significant.
b. r > P.E. (r), then the value of r is definitely significant.
c. In other situations, nothing can be concluded.

The value of r is greater than 6P.E. (r) (i.e. 0.8944>0.3621). It means the value of r is very and highly significant. So, it can be said that actual sales will go in the same direction as budgeted sales.

The regression line can also be fitted to show the degree of relationship between budgeted and actual sales. The correlation analysis refers to the degree of relationship between the variables. But it does not say about which variables is cause and which is effect, while regression analysis established the nature of relationship between two or more variables and then estimate the unknown variables (dependent variables) with the help of known variables (Independent Variables).

For this, actual sales have assumed to be dependent upon the budgeted sales, as independent.

So, regression line is actual sales "Y" on budgeted sales "X" is as follows:

$$y - \bar{y} = \frac{r\sigma y}{\sigma x}(x - \bar{x})$$

Or, $y - 1587615 = 0.8944 \times \frac{52889}{107351.89}(x - 1733753)$

Or, $y - 1587615 = 0.4406\ (x - 1733753)$

Or, $y = 0.4406\,x - 763891.57 + 1587615$

Or, $y = 0.4406x + 823723.43$

It shows positive relationship between the budgeted sales and actual sales. With this equation we can forecast the likelihood of actual sales achievement of the year 2065/66.
If budgeted sales for 2065/66 = Rs. 1947,690,000

$\therefore$ Actual Sales (y) $= 0.4406 \times 1,947,690 + 823,723.43$

$= 858,152.214 + 823,723.43$
$= 1,681,875.64$ or Rs. 1,68,18,76,000

4.2 Cost Structure of DDC

Cost planning and control focuses not only on reducing the costs but also considering the effect of breakdown of machines, frustrating employees, lower quality of productions, etc caused by reduction of cost. Efficient and effective utilization of cost is the major demand and purpose of cost planning.

Cost is defined as an expenditure that is entirely recorded as an asset and becomes an expense when it is 'used up' in the future. Cost can be controllable and non-controllable. In short run, all the variable expenses are controllable and all the fixed expenses are non-controllable.

The cost or expenses of DDC are categorized into four sectors. They are:

- Collection Expenses
- Processing Expenses
- Selling or Distribution Expenses
- Administration Expenses

All the expenses are collected and analyzed with support from the DDC personnel regarding the cost behavior and distributed as below, into fixed, variable and semi-variable cost. Since, they weren't practicing CVP analysis, there were no distinction among cost into fixed or variable, so degree of variability method is used to distinguish the semi-variable cost into fixed and variable cost *(Maheswari; 2000)*.

Semi-variable cost are distributed according to the degree of variability (70%: 30%) *(Hilton; 1997)*. Since, DDC hasn't been practicing CVP analysis and being so vast product line distributed in different regions and branches, degree of variability seems appropriate to distribute semi-variable cost into fixed and variables.

Collection Expenses

Collection expenses includes all the expenses related with collecting milk from various milk formers, and the cost relating to it, such as purchase of milk, porters' wages and transportation expenses, salaries, provident fund, gratuity expenses of those workers engaged in the collection of milk and necessary raw materials. The detailed distributions of collection expenses are presented in the following table 4.5, distributing the cost into fixed and variable and semi-variable expenses are distributed according to the degree of variability method, popularly as 70:30 basis of separation.

Table: 4.5
Distribution of Collection Expenses into Fixed, Variable and Semi-Variable Cost

Variable Cost	Fixed Cost	Semi-Variable Cost Basis: DOV(70:30)	
Purchase of Milk	Salaries	Porters' wages and transportation	FC = 70% VC = 30%
Fuel and other Provision	Provident Fund	Water and Electricity	FC = 30% VC = 70%
Chemicals and Detergents	House and Land Rent	Machine Repairs	FC = 70% VC = 30%
Other Dairy Goods	Tax and Charges	Building Repairs	FC = 70% VC = 30%
Allowance	Bank Commission Charges	Motor Repairs	FC = 70% VC = 30%
Traveling Expenses	Insurance	Other Repairs	FC = 70% VC = 30%
Cleaning & Sanitation	Gratuity Expenses	Stationery and Printing	FC = 70% VC = 30%
Other Transportation Exp.		Ticket, Wire, Telephone	FC = 30% VC = 70%
		Non-durable Office Goods	FC = 70% VC = 30%
		Prize Given to Farmers	FC = 70% VC = 30%

Source: Appendix - 3

Processing Expenses

Processing Expenses is a part of production cost which relates with raw materials, packaging, chemicals and detergents, fuels and other provision, water expenses, electricity expenses, repairs of machines, motors, buildings, etc, salaries, provident fund, etc of the workers associated with the processing of milk and milk products.

Table: 4.6

Distribution of Processing Expenses into Fixed, Variable and Semi-variable Cost

Variable Cost	Fixed Cost	Semi-Variable Cost Basis: DOV(70:30)	
Skimmed Milk Powder Expenses	House and Land Rent	Transportation exp of Butter, Cheese, etc.	FC = 70% VC = 30%
Raw Material Expenses	Salaries	Powder Transportation Expenses	FC = 70% VC = 30%
Packaging Goods	Provident Fund	Water and Electricity	FC = 30% VC = 70%
Chemicals and Detergents	Insurance	Motor Repairs	FC = 70% VC = 30%
Fuel and Other Provision	Gratuity Expenses	Machine Repairs	FC = 70% VC = 30%
Allowances	Bank Commission Charges	Other Repairs	FC = 70% VC = 30%
Traveling Expenses		Stationery and Printing	FC = 70% VC = 30%
Processed Milk Loss		Non-durable Office Goods	FC = 30% VC = 70%
Feed Purchased		Ticket, Wire, Telephone	FC = 30% VC = 70%

Source: Appendix - 4

Selling Expenses

Selling Expenses or Distribution Expenses includes all the costs relating to selling, distribution and delivery of products to customers. It includes salaries, provident fund, insurance, and gratuity expenses of the marketing staffs of DDC and also traveling expenses, Milk and Milk product loss, etc.

Table: 4.7
Distribution of Selling Expenses into Fixed, Variable and Semi-Variable Cost

Variable Cost	Fixed Cost	Semi-Variable Cost Basis: DOV(70:30)	
Allowance	Salaries	Stationery and Printing	FC = 70% VC = 30%
Fuel & Other Provision	Provident Fund	Water and Electricity	FC = 30% VC = 70%
Traveling Expenses	House and Go down Rent	Motor Repairs	FC = 70% VC = 30%
Milk & Milk Product Loss	Insurance	Building Repairs	FC = 70% VC = 30%
Dealer's Facilities	Tax and Charge	Other Repairs	FC = 70% VC = 30%
Milk & Milk Product Commission Exp.	Gratuity Expenses	Milk Transportation Expenses	FC = 70% VC = 30%
		Business Promotion Expenses	FC = 70% VC = 30%
		Non-durable Office Goods	FC = 30% VC = 70%

Source: Appendix - 5

Administration Expenses

Administration expenses include those expenses other than manufacturing and distribution. They are incurred in the responsibility centers that provides supervision of and service of all functions of all the enterprises, rather than in the performance of any one function. Salaries, allowance, Provident Funds, Employees Training Expenses, Employees Welfare Expenses, Insurance, etc. are included under this sector.

Table: 4.8
Distribution of Administration Expenses into Fixed, Variable and Semi-Variable Cost

Variable Cost	Fixed Cost	Semi-Variable Cost Basis: DOV(70:30)	
Allowance	Membership Charges	Water and Electricity	FC = 30% VC = 70%
Fuel and Other Provision	Salaries	Ticket, Wire, Telephone	FC = 30% VC = 70%
Traveling Expenses	Provident Fund	Stationery and Printing	FC = 70% VC = 30%
Guest Entertainment Expenses	House and Go down Rent	Motor Repairs	FC = 70% VC = 30%
Donation	Office Equipment Expenses	Building Repairs	FC = 70% VC = 30%
Examination Expenses	Employees Welfare Expenses	Other Repairs	FC = 70% VC = 30%
Adjustment Expenses	Employees Training Expenses	BOD Meeting Expenses	FC = 70% VC = 30%
Deferred Expenses	Auditor's Expenses	Non-durable Office Goods	FC = 30% VC = 70%
Loss on Sale of Assets	Sub-Committee Fees	Business Promotion Expenses	FC = 70% VC = 30%
Association Development Exp.	Advisory Cost	Meeting Expenses	FC = 70% VC = 30%
	Advertisement		
	Publicity		
	Bank Commission Charges		
	Tax and Charges		
	Funeral Expenses		
	Sanitation Expenses		
	Gratuity Expenses		
	Insurance		
	Bus Fair		
	Legal Expenses		
	Newspaper & Magazines		
	Software Expenses		

Source: Appendix - 6

DDC classified its total cost of collection, processing, selling and administration Expenses into fixed and variable cost for CVP analysis sensitivity analysis. According to the nature of the data, costs are classified as under:

4.2.1 Variable Cost of DDC

Variable Expenses vary in direct proportion to changes in output or activity in a responsibility center. Variable expenses are activity-based because they are incurred as a direct result of output, productive activity, or work done. They would not exist if not for the performance of some activity. Variable expenses increases or decreases directly with changes in outputs, therefore, if output is doubled, the variable expenses is doubled; or if output decreases by 10%, the variable expenses also decreases by 10%.

All the variable costs of collection, processing, selling and administration expenses of DDC are depicted in below table 4.9 table 4.12

Table: 4.9
Variable Collection Expenses

(Rs. In '000')

Collection Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Purchase of Milk	1112413	1045470	1038124	1044700	1101356
Porters Wages & Transportation	4	10	-	1	-
Fuel and other Provision	27813	28993	33210	40186	43760
Chemicals & Detergents	677	655	660	756	966
Other Dairy Goods	576	593	632	657	627
Water & Electricity	4702	4481	3994	3825	3985
Allowance	2442	2645	5986	3836	5623
Machine Repairs	431	495	713	950	970
Building Repairs	91	65	167	143	203
Motor Repairs	3287	3055	3028	3196	3596
Other Repairs	45	47	44	51	64
Stationary & Printing	91	91	100	96	129
Travelling Expenses	3167	3369	3936	3642	4620
Ticket, Wire & Telephones	114	110	110	103	129
Non-Durable office goods	31	27	30	45	51
Prize to formers	21	23	24	20	-
Other Transportation Expenses	6	-	-	23	1
Sanitation Expenses	11	18	29	57	88
Funeral Exp.	-	10	2	-	-
Total	1155922	1090157	1090790	1102287	1166168

Source: Extracted from Appendix-3-6

The variable collection expenses increased to Rs.1090157000 in FY 2060/61 from Rs.1155,922,000 in 2059/60. This decreased by Rs.6576000 or 5.69%. And then to Rs.1090790000 in 2061/62 from Rs.1090157000 in 2060/61. In this FY slightly increased by Rs.633000 or 0.06% in FY 2062/63, total variable collection expenses amount is Rs1102287000. This is increased amount by Rs. 11497000 or 1.05% than the FY 2061/62. And reached Rs.1166168000 in FY 2063164. This amount also increased by Rs.63880000 or 5.80% from the FY 2062/63.

Table 4.10 shows the variable processing expenses of the DDC. In this variable processing expenses decreased by Rs.20061000 (i.e. 10.19%) in F/Y 2060/61. In F/Y 2061/62 extreme increased by Rs.112,709000 (i.e.63.76%). And then in F/Y 2062/63 and 2063/64 decreased by Rs.65450000 (i.e.22.61%) and by Rs.10743000(i.e.4.80%) respectively.

Table: 4.10
Variable Processing Expenses

(Rs. In '000')

Processing Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Skimmed Milk Powder Exp.	52816	39657	98229	69783	56144
Raw Materials and Other	1061	1892	2730	3674	4461
Packaging Goods	69971	60356	63036	68795	73933
Chemicals and Detergents	2476	2983	3593	3476	4049
Other Dairy goods	1331	1276	1189	1474	1611
Cheese butter etc. Transportation Exp.	176	278	475	466	498
Water and Electricity	21754	20780	19529	18171	17951
Fuel and other Provision	30668	33126	36136	45466	42234
Allowance	4815	4520	8820	6675	6675
Motor Repairs	297	277	123	-	-
Machine Repairs	2680	3015	2584	4313	3764
Building Repairs	203	378	190	455	600
Other Repairs	141	141	129	172	168
Travelling Expenses	1174	985	1017	901	945
Stationery and printing	17	86	94	96	138
Non-durable office Goods	40	37	47	68	65
Processed Milk Loss	6934	6642	7866	-	-
Fodder Purchased	21	19	-	-	-
Ticket, wire Telephone	52	44	41	36	45
Powder Trans. Exp	141	270	198	6	-
Funeral Exp.	-	5	43451	-	-
Total	196828	176767	289476	224026	213283

Source: Extracted from Appendix-3-6

Table: 4.11
Variable Selling Expenses

(Rs. In '000')

Selling Expenses	**2059/60**	**2060/61**	**2061/62**	**2062/63**	**2063/64**
Allowance	2167	2175	4512	3424	4482
Stationery & Printing	71	80	91	124	98
Water & Electricity	109	108	105	210	165
Fuel & Other Provision	5043	3451	3427	4758	4123
Motor Repairs	701	601	549	954	773
Building Repairs	1	140	-	11	18
Other Repairs	3	4	7	17	18
Milk Trans. Exp.	4454	5004	4491	4981	4867
Travelling Expenses	137	88	92	109	75
Business Promotion Exp.	52	19	35	81	50
Products Loss	130	130	200	1140	75
Non-durable office goods.	20	34	19	32	27
Dealer Facilities	85	74	34	-	-
Total	12973	11907	13563	14815	14772

Source: Extracted from Appendix-3-6

Variable selling expenses decreased by Rs.1066000 (i.e.8.22%) in F/Y 2060/61 and then by Rs.1656000(i.e. 13.91%) increased in F/Y2061/62 and again increased by 1253000 (i.e.9.24%) in F/Y2062/63 and lastly in F/Y 2063/64 total variable selling expenses decreased by Rs.44000 (i.e.0.30%).

Table: 4.12
Variable Administration Expenses

(Rs. In '000')

Selling Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Allowance	43332	3828	7550	5501	7434
Water & Electricity	15	17	15	14	17
Ticket, Wire & Telephone	847	820	719	863	1059
Stationery & printing	294	324	340	327	388
Fuel & Other Provision	2561	1649	1800	1595	1807
Motor Repairs	336	290	413	240	324
Other Repairs	184	75	64	85	90
Travelling Exp.	57	57	56	55	79
Entertainment Exp.	1456	1362	1695	1809	1682
BOD Meeting Fees	956	1065	1246	1349	1336
Recruitment Cost	29	47	70	56	68
Non-durable office goods	3	6	12	38	270
Donation	80	63	119	103	137
Examination Exp.	115	180	281	428	471
Total Annual day Exp.	-	-	-	-	401
Adjustment Exp.	413	350	647	569	614
Business Promotion Exp.	340	281	509	89	115
Deferred Exp.	2827	2827	-	-	-
Meeting Exp.	36	32	4295	5	51
Sudden Exp.	-	105	166	-	-
Seminar Exp.	-	-	34	39	214
Total	14704	13778	20547	13539	16961

Source: Extracted from Appendix-3-6.

In table 4.12 variable administration expenses decreased by 6.30% in F/Y 2061/61 than the F/Y 2069/60. In F/Y 2061/62 it is increased by 49.13% and the next F/Y i.e.2062/63 it decreased by 34.11%. 25.28% increased in F/Y 2063/64 than the 2062/63. This shows there is high fluctuation regarding this headings.

Variation in variable expenses is due to the various factors. It can be due to changes in sales volume, cost of production, inflation, competition, difference in the tastes and preferences of customers, elasticity of demand, seasonal variations etc.

4.2.2 Fixed Expenses of DDC

Fixed expenses are those that do not vary with output. They occur primarily with the passage of time, i.e. they are time expenses. They remain constant in amount for a given short-term period within a relevant range of activity. Fixed expenses are caused by the holding of assets and the other factors of production in a state of "readiness to produce". Therefore, they are frequently called capacity costs. Fixed costs are of two types:

a. Executive management decisions establish commitments to certain fixed expenses. e.g. Depreciation, tax, insurance etc.
b. Some fixed expenses are set by management discretion on a short-term basis, eg. Salaries, advertisement and research expenses.

They may fluctuate by reason of changes in the basic structure of the business, operating methods and discretionary changes in management policy. The following table shows the different fixed cost under collection, processing and selling and administration headings.

Table: 4.13
Fixed Collection Expenses

(Rs. In '000')

Collection Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Porter's wages & Trans. Exp.	9	24	3	-	-
Water and Electricity	2015	1920	1712	1639	1708
Salaries	22490	21066	21964	24481	23964
Provident Fund	1403	1322	1291	1437	1436
Machine Repair	1006	1155	1663	2216	2263
Building Repair	213	151	390	334	474
Motors Repair	7670	7129	7065	7458	8390
Other Repairs	104	110	102	119	150
House and land rent	914	982	985	1007	1021
Stationary & printing	211	212	233	225	300
Tax and charges	1144	940	1169	1361	1315
Bank Commission charges	973	1573	1287	1341	1436
Ticket, Wire & Telephone	49	47	47	44	55
Insurance	694	496	626	607	709
Non-durable office goods	71	64	71	105	120
Gratuity Exp.	3543	249	2869	-	-
Price to Formers	49	5			
Total	42558	37494	41532	42421	43341
Add/Less Excess Gratuity Exp.	-453	1731	1205	-	-
Net Total	42105	39225	42737	42421	43341

Source: Extracted from Appendix-1 & 3-6.

In table 4.13, fixed collection expenses decreased from Rs.42105000 in F/Y 2059/60 to Rs.39225000 in F/Y 2060/61 (i.e.-2880000 or -6.84%) and then, increased to Rs.42737000 in F/Y 2061/62 (i.e.Rs.3512000 or 8.95%) then slightly decreased to Rs.42421000 in 2062/63 (i.e. 316000 or 0.74%) and finally to 43341000 in 2063/64(i.e. increased by Rs.920000 or 2.17%).

Table: 4.14
Fixed Processing Expenses

(Rs. In '000')

Processing Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Cheese, Butter etc. Trans Exp.	411	649	1108	1087	1163
Water & Electricity	9323	8906	8370	7787	7693
House and land rent	326	375	397	434	415
Salaries	34532	33589	33444	39239	38753
Provident Fund	1931	1831	1800	2103	2126
Motor Repairs	693	647	286	-	-
Machine Repairs	6254	7035	6028	10063	8783
Building Repairs	473	882	444	1061	1400
Other Repairs	330	330	301	402	392
Insurance	749	242	438	524	360
Stationary & Printing	179	200	219	224	323
Tax and Charges	43	81	131	231	2
Non-durable office goods	93	86	110	158	152
Ticket, Wire & Telephone	22	19	18	15	19
Gratuity Exp.	18766	1550	3268	-	22
Powder Trans. Exp.	329	630	463	14	-
Bank Comm. Exp.	28	27	25	34	47
Total	74482	57079	56850	63376	61650
Add/Less: Additional/Access Gratuity Exp.	-2401	10781	1373	-	112
	72081	67860	58223	63376	61762

Source: Extracted from Appendix-1 & 3-6.

In table 4.14 fixed processing expenses are shown. They decreased from Rs.72081000 in F/Y 2059/60 to Rs.67860000 in F/Y 2060/61 i.e. Rs. 4221000 or 5.86% and then to Rs.58223000 in F/Y 2061/62 i.e. Rs.9637000 or 14.20 and then increased to Rs.63376000 in F/Y 2062/63 i.e. Rs. 5153000 or 8.85% but decreased again to Rs.61762000 in F/Y 2063/64 i.e. Rs. 1614000 or 2.55%.

Table: 4.15
Fixed Selling Expenses

(Rs. In '000')

Selling Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Salaries	12096	12008	11663	13776	14280
Provident Fund	737	717	684	779	818
House and Land rent	331	294	256	342	367
Stationery and Printing	167	186	211	229	290
Water and electricity	47	46	45	71	90
Motor repairs	1635	1403	1280	1803	2226
Building Repairs	2	326	3	42	26
Other Repairs	7	9	15	43	39
Milk Tran. Exp.	10392	11675	10480	11357	11623
Business Promotion Exp.	122	43	82	116	189
Insurance	232	135	172	69	102
Tax and Charges	211	235	325	279	439
Non-durable office goods	48	79	45	63	75
Gratuity Exp.	1907	240	2269	-	-
Total	27934	27396	27530	28969	30564
Add/Less: Additional/Access Gratuity Exp.	-244	1670	953	-	-
	27690	29066	28483	28969	30564

Source: Extracted from Appendix-1 & 3-6.

According to table 4.15, fixed selling expenses increased from Rs.27690,000 in F/Y 2069/60 to Rs.29066000 in F/Y 2060/61 i.e. Rs.1376000 or 4.97% and then decreased to Rs.28483000 in F/Y 2061/62 i.e. Rs.583000 or 2% and slightly increased to Rs.28969000 in F/Y 2062/63 i.e. Rs.486000 or 1.71% and finally increased to Rs.30564000 in F/Y 2063/64 i.e. Rs.1595000 or 5.51%.

Table: 4.16
Fixed Selling Expenses

(Rs. In '000')

Processing Expenses	2059/60	2060/61	2061/62	2062/63	2063/64
Salaries	29014	27121	25428	33330	30937
Provident Fund	1812	1734	1738	2025	2023
House and Land Rent	104	84	84	96	96
Water and Electricity	6	7	6	6	7
Ticket, Wire & Telephone	363	351	308	370	454
Stationery and Printing	687	756	794	762	905
Motor Repairs	784	678	965	560	756
Building Repairs	428	174	149	199	210
Other Repairs	134	134	132	129	184
Office Equipment repairs	146	124	167	229	434
Employee Welfare Exp.	99	65	99	126	95
Employee Training Exp.	230	510	475	615	1990
BOD meeting fees	68	110	163	132	159
Auditor's Fees	90	82	180	99	365
Recruitment cost	6	15	29	89	629
Sub-committee cost	312	282	396	619	527
Advisory cost	102	183	181	450	207
Advertisement	1243	1479	1881	1852	3535
Bank commission charges	76	65	88	65	72
Non-durable office goods	186	147	277	241	319
Newspaper and Magazine	141	146	117	123	149
Tax and charges	520	803	684	506	1914
Sanitation Exp.	281	277	283	336	436
Insurance	8981	8740	8552	9158	10851
Membership Charges	6	10	28	38	31
Gratuity Exp.	17393	470	-	5091	3185
Annual day Exp.	177	350	277	244	263
Business promotion exp.	301	932	1204	872	944
Bus Fair	1401	1325	1170	789	836
Funeral Exp.	10	5	-	-	-
Legal Exp	22	-	111	17	-
Meeting Exp.	85	76	10021	115	119
Software Exp.	89	319	80	262	119
Seminar Exp.	-	-	79	91	449
Total	65297	47554	56146	59636	63250
Add/Less: Additional/Access Gratuity Exp.	-2225	3268	-	53753	16146
Net Total	63072	50822	56146	113389	79396

Source: Extracted from Appendix-1 & 3-6

According to table 4.16, fixed administration expenses decreased from Rs.63072000 in F/Y 2059/60 to Rs.5082200 in F/Y 2060/61 i.e. Rs.12250000 or 19.42% and then to Rs.56146000 in F/Y 2061/62 i.e Rs.5324000 or 10.48% increased. In F/Y 2062/63 it was drastically increased to Rs.113389000 i.e. Rs. 57243000 or 101.95% and finally it was decreased to Rs.79396000 i.e. Rs.33993 or 29.98%.

Fixed administration expenses increased more than 100% in the year 2062/63 from Rs.56146000 to Rs.113389000. From there on this is effort seen to decrease the fixed administration expenses. Variations in fixed costs are due to the different level of outputs, changes in number of products produced, change in its price rate, behaviour of employees, proportion of distribution costs, etc.

4.2.3. Semi-Variable Expenses of DDC

Semi-variable costs are those cost that are neither fixed not variable because they passes some characteristics of both. As output changes, semi-variable expenses change in the same direction but not in same proportion to the changes in output.

The variability of semi-variable expenses is caused by the combined effect of:

a. Passage of time
b. Activity or output
c. Discretionary management decision

Semi-variable expenses frequently represent a significant portion of company expenses.

As the DDC is not practicing CVP analysis, it didn't made separation of the cost into fixed and variables. While considering the situation of the DDC, degree of variability (DOV) methods seems to be the appropriate method to separate semi-variable cost into fixed and variables.

Separations of semi-variable cost are made according to degree of variability method. The determinations of degree of variability (popularly 30%:70% Proportion) are done with considering the view of Account Department Personnel, nature of expenses and own intuition judgment.

The use of other methods to differentiate fixed and variable from semi-variable cost seems almost impossible as the DDC is not practicing CVP analysis and its market spread over among different districts and wide varieties of products.

All the semi-variable costs are distributed to fixed and variable cost and these costs are presented in their respective fixed cost and variable cost.

Like all the semi-variable cost of collection expenses are separated into fixed and variable cost and included in fixed all the other sectors expenses are allocated in their respective expenses. And the basis of separating the different cost into fixed and variable is done on the basis as shown in the collection, processing, selling and administration expenses of DDC in table above (4.5-4.8).

The following table shows the difference of Semi-variable cost in different departments.

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Table: 4.17

Separation of Semi-Variable Cost of Collection Expenses into Fixed and Variable Cost

(Rs. In '000')

Collection Expenses	2059/60			2060/61			2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Porter's Wages(7:3)	13	9	4	34	24	10	4	3	1	1	-	1	-	-	-
Water & Electricity(3:7)	6717	2015	4702	6401	1920	4481	5706	1712	3994	5464	1639	3825	5693	1708	3985
Machine Repairs(7:3)	1437	1006	431	1650	1155	495	2376	1633	713	3166	2216	950	3233	2263	970
Building Repairs(7:3)	305	213	92	215	151	65	557	390	167	477	334	143	677	474	203
Motor Repairs(7:3)	10957	7670	3287	10184	7129	3055	10093	7065	3028	10654	7458	3196	11986	8390	3596
Other Repairs(7:3)	149	104	45	158	110	47	146	102	44	170	119	51	214	150	64
Stationery & Printing (7:3)	302	211	91	303	212	91	333	233	100	321	225	96	429	300	129
Ticket, Wire & Telephone(3:7)	163	49	114	158	47	110	157	47	110	147	44	103	184	55	129
Non-Durable Office Goods (7:3)	102	71	31	91	64	27	101	71	30	150	105	45	171	120	51
Price to Farmer (7:3)	71	50	21	77	54	23	79	55	24	67	47	20	-	-	-
Total	20216	11398	8818	19271	10867	8404	19552	11341	8211	20617	12187	8430	225870	13460	9127

Table: 4.18

Separation of Semi-Variable Cost of Processing into Fixed and Variable Cost

(Rs. In '000')

'000'Processing Expenses	2059/60			2060/61			2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Butter, Cheese etc. Trans. Exp. (7:3)	587	411	176	927	649	278	1583	1108	475	1553	1087	466	1661	1163	498
Powder Trans. Exp. (7:3)	470	329	141	900	630	270	661	463	198	50	14	36	45	-	45
Water and Electricity(3:7)	31077	9323	21754	29686	8906	20780	27899	8370	19529	25958	7787	18171	25644	7693	17951
Motor Repairs(3:7)	990	693	297	924	647	277	409	286	123	-	-	-	-	-	-
Machine Repairs(3:7)	8934	6254	2680	10050	7035	3015	4612	6028	2584	14376	10063	4313	12547	8783	3764
Building Repairs(7:3)	676	473	203	1260	882	378	634	444	190	1516	1061	455	2000	1400	600
Other Repairs (7:3)	471	330	141	471	330	141	430	301	129	574	402	172	560	392	168
Stationary & Printing(7:3)	256	179	77	286	200	86	313	219	94	320	224	96	461	323	138
Non-durable office goods(7:3)	133	93	40	123	86	37	157	110	47	226	158	68	217	152	65
Ticket, Wire & Telephone(3:7)	74	22	52	63	19	44	59	18	41	51	15	36	64	19	45
Total	43668	18107	25561	44690	19384	25306	40757	17347	23410	45076	21263	23813	68843	45569	23274

Table: 4.19

Separation of Semi-Variable Cost of Selling Expenses into Fixed & Variable Cost

(Rs. In '000')

Selling Expenses	2059/60			2060/61			2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Stationery & Printing (7:3)	238	167	71	226	186	80	302	211	91	353	229	124	388	290	98
Water and Electricity(3:7)	156	47	109	154	46	108	150	45	105	281	71	210	255	90	165
Motor Repairs(7:3)	2336	1635	107	2004	1403	601	1829	1280	549	2757	1803	954	2999	2226	773
Building Repairs(7:3)	3	2	1	466	326	140	4	3	1	53	42	11	44	26	18
Other Repairs(7:3)	10	7	3	13	9	4	22	15	7	60	43	17	57	39	18
Milk Trans. Exp.(7:3)	14846	10392	4454	16679	11675	5004	14971	10480	4491	16338	11357	4981	16490	11623	4867
Business Promotion Exp. (7:3)	174	122	52	62	43	19	117	82	35	197	116	81	239	189	50
Non-Durable Office goods(7:3)	68	48	20	113	79	34	64	45	19	95	63	32	102	75	27
Total	17831	12420	5411	19757	13767	5990	17459	12161	5298	20134	13724	6410	20574	14558	6016

Table: 4.20
Semi-Variable Cost of Administration Expenses into Variable and Fixed

(Rs. In '000')

Selling Expenses	2059/60			2060/61			2061/62			2062/63			2063/64		
	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable	Total	Fixed	Variable
Water & Electricity(3:7)	21	6	15	24	7	17	21	6	15	20	6	14	24	7	17
Ticket, Wire & Telephone(3:7)	1210	363	847	1171	351	820	1027	308	719	1233	370	863	1513	454	1059
Stationery & Printing(7:3)	981	687	294	1080	756	324	1134	794	340	1089	762	327	1293	905	388
Motor Repairs (7:3)	1120	784	336	968	678	290	1378	965	413	800	560	240	1080	756	324
Building Repairs (7:3)	612	428	184	249	174	75	213	149	64	284	199	85	300	210	90
Other Repairs(7:3)	191	134	57	191	134	57	188	132	56	184	129	55	263	184	79
BODFees (7:3)	97	68	29	157	110	47	233	163	70	188	132	56	227	159	68
Recruitment Fees (7:3)	9	6	3	21	15	6	42	29	12	127	89	38	899	629	270
Non-Durable Office Goods(7:3)	266	186	80	210	147	63	396	277	119	344	241	103	456	319	137
Annual day Exp. (3:7)	590	177	413	700	350	350	924	277	647	813	244	569	877	263	614
Business Promotion Exp.(7:3)	430	301	129	1332	932	400	1720	1204	516	1246	872	374	1348	944	404
Total	5527	3140	2387	6103	3654	2449	7276	4304	2972	6328	3604	2724	8280	4830	3450

4.3 Difference of Gratuity Expenses

The differences in the gratuity expenses stated in the profit and loss account of DDC are distributed to the different sectors according to the percentage of gratuity expenses incurred in their respective sectors.

Table: 4.21

Distribution of Difference in Gratuity Expenses to Different Cost Structure

(Rs in '000')

Gratuity Expenses in Year	Total	Collection Exp.	Processing Exp.	Selling Exp.	Administration Exp.
2059/60	41609	3543	18766	1907	17.393
Percentage	100%	8.51%	45.10%	4.58%	41.80%
Less Excess Gratuity Exp.	(5324)	453	2401	244	2225
Percentage	100%	9.92%	61.78%	9.57%	18.73%
Add: Additional Gratuity Exp.	17450	1731	10781	1670	3268
2061/61	2509	249	1550	240	470
Percentage	100	9.92	61.78	9.57	18.73
Add Additional Gratuity Exp.	17450	1731	10781	1670	3268
2061/62	8406	2869	3268	2269	-
Percentage	100%	34.13%	1373	953	-
Add: Additional Gratuity Exp.	3531	1205	1373	953	-
2062/63	5091	-	-	-	5091
Percentage	100%	-	-	-	100%
Add: Additional Gratuity Exp.	53753	-	-	-	53753
2063/64	3207	-	22	-	3185
Percentage	100%	-	0.69%	-	99.31%
Add: Additional Gratuity Exp.	16258	-	112	-	16146

Source: Extracted from Appendix – 1

Gratuity expenses are allocated to according to above table in their appropriate fixed collection, selling and administration expenses.

4.4 Sundry Incomes of DDC

Sundry Incomes of DDC constitutes the following incomes generated by the DDC in their respective years.

It constitutes interest received from investment, interest from bank, goods auctioned, fines and deposit forfeiture and other incomes. The detailed sundry incomes are presented below in table 4.22

Table: 4.22

Sundry Income from F/Y 2059/60-2063/64

(Rs. In '000')

Statements	2059/60	2060/61	2061/62	2062/63	2063/64

Interest Income	7416	6384	4147	4964	6150
Interest on Investment	1526	396	1450	1488	1588
Tender Forms Sale	452	415	526	369	376
Goods Auctioned	250	1016	530	1421	4
Fines & Deposit Forfeiture	207	323	424	2478	182
Other Incomes	2857	2132	3393	3979	19
Reduced Trans Cost	843	874	1298	1032	4122
Skimmed Milk Sales	-	5	-	-	22
Materials Sales %	-	-	1373	1209	-
Total	13551	11545	13141	16940	12463
Increase/ Decrease %	21.99	-14.80	13.82	28.90	-26.43

Source:-DDC Annual Report: F/Y 2069/60-2063/64

4.5 Inventory Consideration of DDC

Volume of production and that of sales almost never be same for any given period of company's activity. Either sales will exceed production or vice-versa.

The term inventory includes the stock in hand of raw materials, work-in-progress, finished products, etc. the main reason for holding inventories by the company is to supply goods regularly without delays and continue their work effectively and efficiently in general, investment in inventory is considered to be burden of cost so, investment in inventory is unnecessary and extra burden of cost.

Sales, production and inventory are interrelated with each other. Finished goods inventory bridges the gap between the production and sales.

If a sale exceeds production, then inventory covers the deficit and if production excesses sales, then the over production is stocked as inventory.

Table: 4.23

Inventory Balance from 2059/60-2063/64

(Rs. In '000')

Particulars/ Items	2059/60	2060/61	2061/62	2062/063	2063/64
Milk	6308	6734	6838	6606	6713
Butter	12830	21163	17420	39264	23158
Cheese	6294	5264	7975	10065	10995
Ghee	2569	3228	5289	9753	5867
Curd	218	258	332	363	407
Ice-Cream	180	457	294	26	574
Cream	315	174	281	281	453
Paneer	56	71	81	117	163
Skimmed Milk Powder	35951	7641	2522	31598	42485
Rasbari	11	15	21	35	108
Lassi	-	0.358	-	5	1

Pedo	-	119	41	49	116
Lalmohan	-	38	24	26	154
Fresh Milk	-	26	14	29	92
Mohi	-	0.16	12	11	8
Ledikeni	-	-	7	4	-
Balu Shahi	-	-	5	-	-
Khuwa	-	-	26	12	-
Gudpak	-	-	2	3	1
Total Closing Inventory	64732	45189	41184	98247	91295
Less : Opening Inventory	38870	64732	45189	41184	98247
Increase/Decrease in Inventory	25862	(19543)	(4005)	57063	(6952)

Source: DDC Annual Report 2059/60-2063/64

After the analysis of above table, there was no inventory policy in the DDC. There is wide fluctuation in the inventory level of DDC. In F/Y 2059/60, there was increased in inventory by Rs.25862 thousand and then decreased in inventory by Rs.19543 thousand in 2060/61. Like that in F/Y 2062/63. Inventory increased by Rs.57063 thousand but in F/Y 2063/64 it is decreased by Rs.6952 thousand.

4.6 Capacity Utilization of DDC

Capacity utilization is one of the ways to improve the financial performance of any organization. Large sum of money is being spent and invested acquire fixed assets. So proper utilization of the fixed assets is possible with efficient to utilization of the fixed assets. Under- utilization increases the cost of productions and over utilization of capacity reduces the life of the machines. DDC has a total production capacity of 250000 liters holding capacity and per shift production capacity (in 5 hrs) of DDC is as follows.

Table: 4.24
Capacity Utilization of DDC

S. No.	Particulars	Production Capacity/Hour	Holding Capacity/Hour	Per Shift Production Capacity (5Hours)
1	Kathamandu	15000	135000	75000
2	Hetauda	3000	60000	15000
3	Biratnagar	5000	90000	15000
4	Pokhara	2000	21000	10000
Total		25000	306000	115000

Source : Sinhabalokan (2057/58)

In the case of skimmed milk plant, it has a capacity of maximum of 40,000 lts of milk processed per shift and can produce 3 metric tones of milk powder.

Table: 4.25

Capacity Utilization by the DDC

F/Y	Production (in Lakh)	Capacity Utilization
2059/60	767.43	168.2%
2060/61	763.44	167.33%
2061/62	726.78	159.29%
2062/63	708.74	155.34%
2063/64	678.34	148.68%

Capacity Utilization : Production × 100/Capacity 456.25

The above table provides the information that DDC has been over-utilizing the capacity of the fixed assets. Over-utilization of the machines reduces its life and also increase the cost of repairs and maintenance for the machines. Moreover, there is a great chance of break down of machine that will result in not meeting the demand of the customers which leads to loss of customers. So, DDC should install more machines according to the need of the demands.

4.7 CVP Analysis of DDC

CVP enables to study the effect of business activities on the expenses. Understanding of the aforementioned relationship plays a considerable role in correct prospective business planning and budgeting.CVP analysis helps managers to see in advance the effect of different strategies and decisions on business activities. It is an analytical tool used to study the behavior of profit in response to the changes in volume, cost and prices.

It is a device used to determine the usefulness of the profit planning process of the firm. In fact, the entire field of profit planning has become associated with the CVP interrelationships. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. As an ultimate objective, it helps management in seeking the most profitable cost and volume. A dynamic management, therefore uses CVP analysis to predict and evaluate the implications of its short-run decisions about fixed cost, variable cost, volume and selling price for its profit plans on a continuous basis.

CVP analysis is a way to quickly answer a number of important questions about the profitability of a company's products or services. CVP analysis can be used with either a product or service.

DDC hasn't been practicing CVP analysis. So while analyzing CVP analysis, constant care has been taken to differentiate the various cost into fixed and variables. Here, we find out the different important ratios to dig out the reasons for the losses of DDC. Under this headings.

1. Contribution margin
2. P/V ratio or C.M. Ratio
3. BEP with four assumptions:

a. Omit inventory change and include other Sundry incomes.
b. Omit both inventory change and other Sundry incomes
c. Include inventory change but omit other Sundry incomes.
d. Include both inventory change and other Sundry incomes.

4. Margin of safety with different BEP, etc are analyze here.

The below table 4.26 and table 4.27 are the income statement for the CVP analysis of DDC from 2059/60 to 2063/64

Table 4.26
Income Statement for CVP analysis of 2059/60

(Rs. In '000')

2059/60			
	Total	Fixed Cost	Variable Cost
Sales	**1595907**		
Less: Manufacturing Costs:			
Collection Exp	1198027	42105	1155922
Processing Exp.	268909	72081	196828
Total Manufacturing Cost	1466936	114186	1352750
Percentage	100%	7.78%	92.22%
Add/Less: Decrease/Increase In Inventory	(25862)	(2012)	(23850)
Cost of Goods Sold	**1441074**	**112174**	**1328900**
Gross Margin	**154833**		
Less : Selling & Administration Cost:			
Selling Expenses	40663	27690	12973
Administration Expenses	77776	63072	14704
Depreciation	29429	29429	
Interest on Loan	11584	11584	
Total Selling Administration Cost:	**159452**	**131775**	**27677**
Operating Profit/Loss	**(4619)**		
Non-Operating Sundry Income	**13551**		
Net Income/ Loss	**8932**		
TFC and TVC excluding Inventory Change		245961	1380427

Table: 4.27

Income Statement for CVP analysis of 2060/61and 2061/062

(Rs. In '000')

	2060/61			2061/62		
	Total	**Fixed Cost**	**Variable Cost**	**Total**	**Fixed Cost**	**Variable Cost**
Sales	**1535810**			**1589663**		
Less: Manufacturing Costs:						
Collection Exp	1129382	39225	1090157	1133527	42737	1090790
Processing Exp.	244627	67860	176767	347699	58223	289476
Total Manufacturing Cost	**1374009**	**107085**	**1266924**	**1481226**	**100960**	**1380266**
Percentage	100%	7.79%	92.21%	100%	6.82%	93.18%
Add/Less: Decrease/Increase In Inventory	19543	1522	18021	4005	273	3732
Cost of Goods Sold	**1393552**	**108607**	**1284945**	**1485231**	**100687**	**1383998**
Gross Margin	**142258**			**104432**		
Less : Selling & Administration Cost:						
Selling Expenses	40973	29066	11907	42046	28483	13563
Administration Expenses	64600	50822	13778	76693	56146	20547
Depreciation	29994	29994		29406	29406	
Interest on Loan	4319	4319		4522	4522	
Total Selling Administration Cost:	**139886**	**114201**	**25685**	**152667**	**118557**	**34110**
Operating Profit/Loss	**2372**			**(48235)**		
Non-Operating Sundry Income	11545			13141		
Net Income/Loss	**13917**			**(35094)**		
TFC and TVC excluding Inventory Change		221286	1292609		218971	1414376

Table: 4.28

Income Statement for CVP Analysis of 2062/63 and 2063/64

(Rs. In '000')

	2062/63			**2063/64**		
	Total	**Fixed Cost**	**Variable Cost**	**Total**	**Fixed Cost**	**Variable Cost**
Sales	**1536341**			**1680354**		
Less: Manufacturing Costs:						
Collection Exp	1144709	42421	1102288	1209509	43341	1166168
Processing Exp.	287402	63376	224026	275045	61762	213283
Total Manufacturing Cost	**1432111**	**105797**	**1326314**	**1484554**	**105103**	**1379451**
Percentage	100%	7.39%	92.61%	100%	7.08%	92.92%
Add/Less: Decrease/Increase In Inventory	(57063)	(4217)	(52846)	6952	492	6460
Cost of Goods Sold	**1375048**	**101580**	**1273468**	**1491506**	**105595**	**1385911**
Gross Margin	**161293**			**188848**		
Less : Selling & Administration Cost:						
Selling Expenses	43784	28969	14815	45336	30564	14772
Administration Expenses	126928	113389	13539	96357	79396	16961
Depreciation	31779	31779		34210	34210	
Interest on Loan	4664	4664	28354	3615	3615	
Total Selling Administration Cost:	**207155**	**178801**		**179518**	**147785**	**31733**
Operating Profit/Loss	**(45862)**			**9330**		
Non-Operating Sundry Income	16940			12463		
Net Income/Loss	**(28922)**			**21793**		
TFC and TVC excluding Inventory Change		284598	1354668		252888	1411184

4.7.1 Contribution Margin

Contribution Margin is the difference between the sales and the marginal variable cost of sales and it contributes towards fixed expenses and profit.

Contribution Margin = Selling Price- Variable Cost

Table 4.29
Contribution Margin

Fiscal Year	Contribution Margin
2059/60	Rs. 239330
2060/61	Rs. 225180
2061/62	Rs. 171555
2062/63	Rs. 234519
2063/064	Rs. 262710

The contribution margin of five financial years are not is same trend. First three years suffer decreasing and last two years enjoying few increases. Even though, this is not satisfactory. Higher the contribution margin, greater is the chance to meet the fixed cost and earn a margin for the non-operating expenses and create reserve and pay dividend etc.

4.7.2 P/V Ratio

It is an important tool in studying the profitability of a business. It established relationship between contribution and the sales value.

It can also be found from the relationship between the change in the contribution and change in the sales. It is written in the form of percentages. It is also known as contribution margin ratio (C.M. Ratio)

P/V Ratio = $1-\frac{b}{p}$

Where, b – Variable Cost
P – Sales

Table 4.30
P/V Ratio

Fiscal Year	Contribution Margin
2059/60	$1-\frac{(1380427-23850)}{1595907}=0.1500 \text{ or } 15\%$
2060/61	$1-\frac{(1292609+18021)}{1535810}=0.1466 \text{ or } 14.66\%$
2061/62	$1-\frac{(1414376+3732)}{1589663}=0.1079 \text{ or } 10.79\%$
2062/63	$1-\frac{(1354668-52846)}{1536341}=0.1526 \text{ or } 15.26\%$

2063/064	$1-\frac{(1411184+6460)}{1680354}=0.1563\text{ or }15.63\%$

Higher the contribution margin ratio, higher will be the profit. DDC should try to reduce the variable cost or increase the sales volume to get the higher C.M. Ratio or P/V Ratio to result higher profit.

4.7.3 Break-Even Analysis of DDC

Breakeven (B/E) analysis is a logical extension of marginal costing. It is based on the same principle of classifying the operating expenses into fixed and variable. Now a days it has become a powerful instrument in the hands of policy makers to maximize profit.

The breakeven analysis is a specific way of presenting and studying the inter-relationship between the cost, volume and profit. It provides information to management in the most precise manner. The B/E analysis established a relation between the revenues and cost with respect to the volume. It indicates the level of sales at which cost and revenue are in equilibrium. The equilibrium point is normally called BEP.

The BEP can be defined as that point of sales at which the total revenue is equal to total cost. For BEP to occur, it is necessary that firm have same variable, and fixed cost. If all the costs of the firms are variable, no profit no loss or BEP would be at zero sales volume on the other hand , if all costs were fixed, the BEP would occur at a point where revenue is equal to total fixed cost. The BEP can be computed in terms of units as well as rupees.

BEP (Units) $=\frac{\text{Total Fixed Cost}}{\text{Selling Price Per Unit}-\text{Variable Cost Per Unit}}$

BEPC (Rs) $=\frac{\text{Total Fixed Cost}}{1-\frac{\text{VCPU}}{\text{SPPU}}}$

This formula is appropriate when there is stable inventory and there is no other source of incomes.

Keeping in view about BEP can be calculated considering the following four assumptions.

Assumption 1: Exclude Inventory Change and Include other Sundry Incomes.

BEP $=\frac{\text{Fixed Cost Excluding Inventory}-\text{Other Sundry Incoms}}{1-\frac{\text{Variable Cost Consistant with Sales}}{\text{Sales}}\text{ or}\frac{\text{P}}{\text{V}}\text{Ratio}}$

<u>Assumption 2 : Exclude both – Inventory Change and Other Sundry Incomes</u>

BEP $=\frac{\text{Fixed Cost Excluding Inventory Change}}{1-\frac{\text{Variable Cost Consistant with Sales}}{\text{Sales}}\text{ or}\frac{\text{P}}{\text{V}}\text{Ratio}}$

<u>Assumption 3 : Exclude both – Inventory Change and Other Sundry Incomes</u>

$$BEP = \frac{\text{Fixed Cost Including Inventory Change}}{1-\frac{\text{Variable Cost Consistant with Sales}}{\text{Sales}} \text{ or} \frac{P}{V}\text{Ratio}}$$

<u>Assumption 4 : Exclude both – Inventory Change and Other Sundry Incomes</u>

$$BEP = \frac{\text{Fixed Cost Including Inventory Change}}{1-\frac{\text{Variable Cost Consistant with Sales}}{\text{Sales}} \text{ or} \frac{P}{V}\text{Ratio}}$$

Table: 4.31
Calculation of BEP Sales Under Different Assumptions

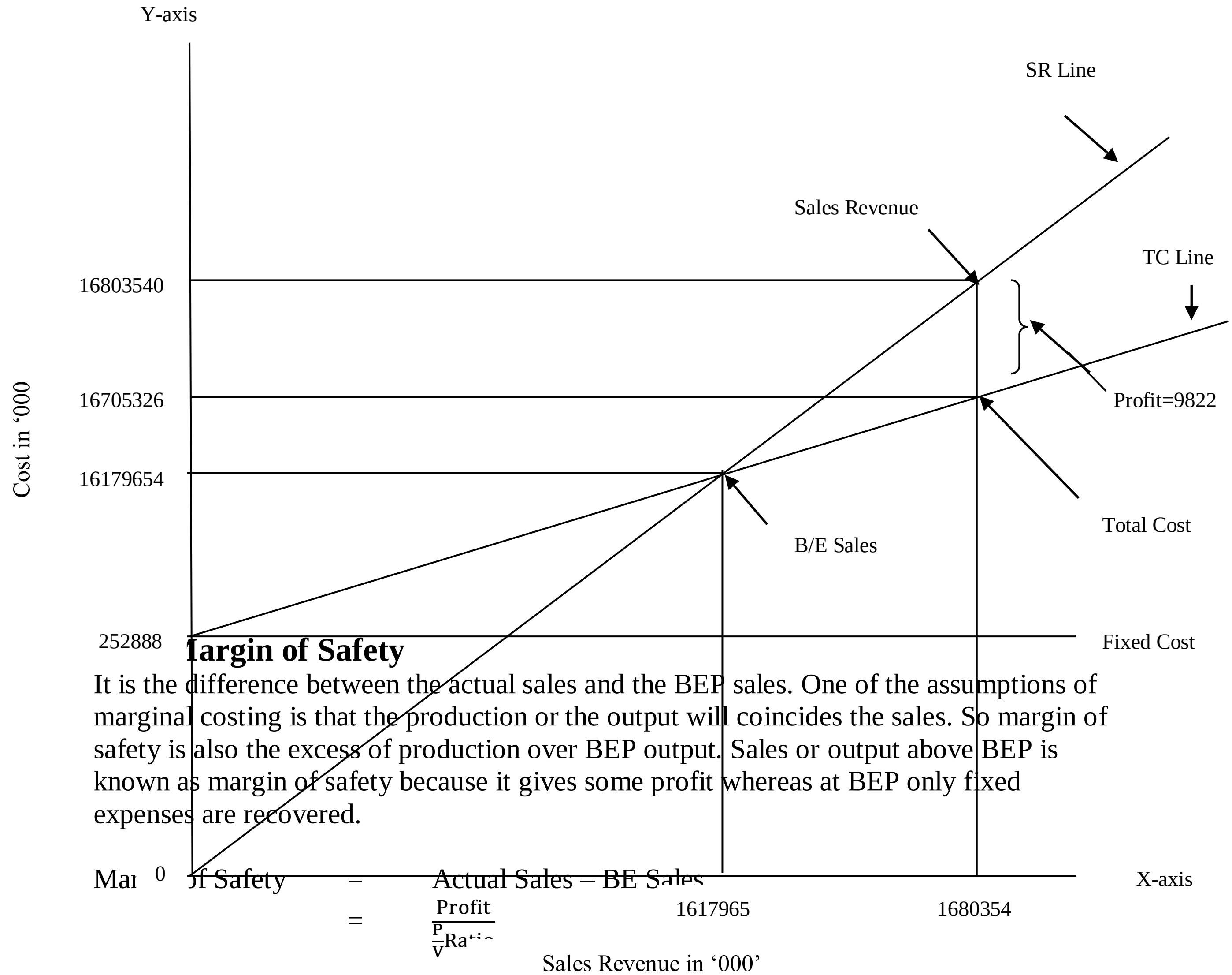
BEP Calculation	2059/60	2060/61	2061/62	2062/63	2063/64
Assumption -1	1549400	1430703	1907600	1753984	1538228
Assumption -2	1639740	1509454	2029388	1864993	1617965
Assumption -3	1626327	1519836	2031918	1837359	1617274
Assumption -4	1535987	1441085	1910130	1726350	1541376

Source: Appendix – 8

The below figure 4.3 is presented to point out the BEP sales, considering no change in inventory and Sundry Incomes. In this X-axis is treated as sales revenue and Y-axis is graphed as cost in amount. Since, fixed cost is constant over a year, the fixed cost curve is parallel to x-axis. The total cost increase with the increases in sales revenues. So total cost curve slope upward to right side. Total cost curve starts from fixed cost of Rs.252,888,000. The Rs.252,888,000 is also total cost when sales revenue is zero. Sales revenue curve starts from zero as sales revenue will be zero, when sales volume is zero. This chart also shows that sales revenue is also slopping upward to the right.

The point at which the sales revenue and total cost lines intersect is the BEP sales. Here in F/Y 2063/64, When inventory change and other Sundry Incomes are not considered, BEP sales are Rs.1,617,965,000. If actual sales are more than BEP, then the profit will occur otherwise, if actual sales are less than BEP sales, loss will occur. Here, actual sales Rs.1,680,354,000 is greater than total cost Rs.1,670,532,000, Which leads to an operating profit of Rs. 9,822,000.

Figure: 4.3
Break-Even Chart of DDC 2063/64



Margin of Safety
It is the difference between the actual sales and the BEP sales. One of the assumptions of marginal costing is that the production or the output will coincides the sales. So margin of safety is also the excess of production over BEP output. Sales or output above BEP is known as margin of safety because it gives some profit whereas at BEP only fixed expenses are recovered.

Margin of Safety = Actual Sales – BE Sales

$$= \frac{\text{Profit}}{\frac{P}{V}\text{Ratio}}$$

Table: 4.32
Calculation of MOS under Different Assumptions

MOS Calculations	2059/60	2060/61	2061/62	2062/63	2063/64
Assumption 1	46507	105107	-317937	-217643	142126
Assumption 2	-43833	26356	-439725	-328652	62389
Assumption 3	-30420	15974	-442255	-301018	63080
Assumption 3	59920	94725	-320467	-190009	138978

Source : Appendix-8

4.7.5 Statement of Overall CVP Analysis
Profit planning of the DDC hasn't been successful, as they didn't practice CVP analysis. There is no proper practice of segregating different cost into fixed and variables, resulting

in low contribution margin, high variable cost, high fixed cost to recover from contribution margin.

The detailed descriptions have been presented below in year-wise.

Table: 4.33
Overall Statement of CVP Analysis Under Four Assumptions
(F/Y 2059/60)

(Rs. In '000')

Statement	Assumption 1	Assumption 2	Assumption 3	Assumption 3
Sales	**1595907**	**1595907**	**1595907**	**1595907**
Less: V.C.	1356577	1356577	1356577	1356577
Contribution Margin	239330	239330	239330	239330
Less : Fixed Cost	245961	245961	243949	243949
Operating Income/Loss	**-6631**	**-6631**	**-4619**	**-4619**
Add: Sundry Income	13551	-	-	13551
Net Income/Loss	6920	-6631	-4619	8932
P/V Ratio	**0.15**	**0.15**	**0.15**	**0.15**
BEP	**1549400**	**1639740**	**1626327**	**1535987**
MOS	**46507**	**-43833**	**-30420**	**59920**
% of V.C. of Sales	85	85	85	85
% of F.C. to Sales	15.41	15.41	15.29	15.29

Source : Appendix -8

The contribution margin for F/Y2059/60 was Rs.239,330 thousand or contribution margin ratio of 15% which is too low to cover the fixed cost which is 15.41% to sales in considering assumption 1 and 2 and 15.29% in consideration of assumption3 and 4. DDC has incurred profit of Rs.6920000 when excluding inventory change and including other Sundry incomes (Assumption 1), incurred loss of Rs.6631000 when excluding both inventory change and other sundry incomes (Assumption2), incurred loss of Rs.4619000 while considering only inventory change (Assumption3) and incurred a profit of Rs.8932000 when including both inventory change (Assumption4). This proves that other Sundry incomes also contribute a lot to DDC overall revenue.

Table: 4.34
Overall Statement of CVP Analysis Under Four Assumptions
(F/Y2060/61)

(Rs. In '000')

Statement	Assumption 1	Assumption 2	Assumption 3	Assumption 3
Sales	**1535810**	**1535810**	**1535810**	**1535810**
Less: V.C.	1310630	1310630	1310630	1310630
Contribution Margin	**225180**	**225180**	**225180**	**225180**
Less : Fixed Cost	221286	221286	222808	222808
Operating Income/Loss	**3894**	**3894**	**2372**	**2372**
Add: Sundry Income	11545	-	-	11545

Net Income/Loss	15439	3894	2372	13917
P/V Ratio	**0.1466**	**0.1466**	**0.1466**	**0.1466**
BEP	**1430703**	**1509454**	**1519836**	**1441085**
MOS	**105107**	**26356**	**15974**	**94725**
% of V.C. of Sales	85.34	85.34	85.34	85.34
% of F.C. to Sales	14.41	14.41	14.51	14.51

Source: Appendix-8

The Contribution margin for F/Y 2060/61 was Rs.225180,000 or contribution margin ratio of 14.66%, which is just cover the fixed cost which is 14.41% to sales in assumption 1 and 2 and 14.51% in assumption 3 and 4 leading to a profit of Rs.15439000, Rs.3894000 Rs.2372000 and Rs.13917000 under the four respective assumptions.

Therefore, BEP sales for F/Y 2060/61 considering four assumptions are Rs.1430703000, Rs.1509454,000. Rs.1499072000 and Rs.1420321000 which is less than sales value (i.e.Rs.1535810000) and MOS is also positive in considering all the four assumptions.

Table: 4.35
Overall Statement of CVP Analysis Under Four Assumptions
(F/Y 2061/62)

(Rs. In '000')

Statement	**Assumption 1**	**Assumption 2**	**Assumption 3**	**Assumption 3**
Sales	**1589663**	**1589663**	**1589663**	**1589663**
Less: V.C.	1418108	1418108	1418108	1418108
Contribution Margin	171555	171555	171555	171555
Less : Fixed Cost	2189710	218971	219244	219244
Operating Income/Loss	**-47416**	**-47416**	**-47689**	**-47689**
Add: Sundry Income	13141	-	-	13141
Net Income/Loss	-34275	-47416	-47689	-34548
P/V Ratio	**0.1079**	**0.1079**	**0.1079**	**0.1079**
BEP	**1907600**	**2029388**	**2031918**	**1910130**
MOS	**-317937**	**-439725**	**-442255**	**-320467**
% of V.C. of Sales	89.21	89.21	89.21	89.21
% of F.C. to Sales	13.77	13.77	13.79	13.79

Source: Appendix -8

The contribution margin for 2061/62 was Rs.1715550000 or ratio of 10.79% which is too low to cover the fixed cost which is 13.77% to sales in assumption 1 and 2 and 13.79% in assumption 3 and 4, leading to a loss of Rs.34275000, Rs.47416000, Rs.47689000 and Rs.47689000 under the four respective assumptions.

Therefore BEP sales for F/Y 2061/62 considering four assumptions are Rs.1907600000, Rs.2029388000, Rs.2026858000 and Rs.1905070000 which is more than sales value (i.e. Rs.1589663000) and MOS is also negative in considering all the four assumptions.

Table: 4.36
Overall Statement of CVP Analysis Under Four Assumptions
(F/Y 2062/63)

(Rs. In '000')

Statement	**Assumption 1**	**Assumption 2**	**Assumption 3**	**Assumption 3**
Sales	**1536341**	**1536341**	**1536341**	**1536341**
Less: V.C.	1301822	1301822	1301822	1301822
Contribution Margin	234519	234519	234519	234519
Less : Fixed Cost	284598	284598	280381	280381
Operating Income/Loss	**-50079**	**-50079**	**-45862**	**-45862**
Add: Sundry Income	16940	-	-	16940
Net Income/Loss	-33139	-50079	-45862	-28922
P/V Ratio	**0.1526**	**0.1526**	**0.1526**	**0.1526**
BEP	**1753984**	**1864993**	**1837359**	**1726350**
MOS	**-217643**	**-328652**	**-301018**	**-190009**
% of V.C. of Sales	84.74	84.74	84.74	84.74
% of F.C. to Sales	18.52	18.52	18.25	18.25

Source : Appendix – 8

The contribution margin for 2062/63 was Rs.234519000 or ratio of 15.26%, which is lower than the fixed cost which is 18.52% to sales in considering assumption 1 and 2 and 18.25% in assumption 3 and 4, leading to a loss of 33139000, Rs.50079000, Rs.45862000 and Rs.28922000 under the four respective assumptions. Therefore, BEP sales for F/Y 2062/63 considering four assumptions are Rs. 1753984000, Rs.1864993000, Rs. 1892628000 and Rs.1781619 which is more than the sales value (i.e. Rs.1536341000) and MOS is also negative in all four assumptions.

Table: 4.37
Overall Statement of CVP Analysis Under Four Assumptions
(F/Y 2063/64)

(Rs. In '000')

Statement	Assumption 1	Assumption 2	Assumption 3	Assumption 3
Sales	**1680354**	**1680354**	**1680354**	**1680354**
Less: V.C.	1417644	1417644	1417644	1417644
Contribution Margin	262710	262710	262710	262710
Less : Fixed Cost	252888	252888	262710	262710
Operating Income/Loss	**9822**	**9822**	**9330**	**9330**
Add: Sundry Income	12463	-	-	12463
Net Income/Loss	22285	9822	9330	21793
P/V Ratio	**0.1563**	**0.1563**	**0.1563**	**0.1563**
BEP	**1538228**	**1617965**	**1617274**	**1541376**
MOS	**142126**	**62389**	**63080**	**138978**
% of V.C. of Sales	84.37	84.37	84.37	84.37
% of F.C. to Sales	15.05	15.05	15.08	15.08

Source : Appendix – 8

The contribution margin for F/Y 2063/64 was Rs.262710000 or contribution margin ratio of 15.63% which is slightly higher than the fixed cost which is 1505% to sales in considering assumption 1 and 2 and 15.08% in assumption 3 and 4, leading to a profit of Rs.22,285000 Rs.9822000, Rs.9330000 and Rs.21793000 under the four respective assumptions.

Therefore BEP sales for F/Y 2063/64 considering four assumptions are Rs.1538228000 Rs.1617965000 Rs.1614818000 and Rs.1535080000 lesser than the sales value (i.e. Rs.1680354) and MOS also positive in considering all the four assumptions.

4.8 Sensitivity of CVP Analysis

Sensitivity of CVP analysis is the study of the CVP analysis in the different stages or in the different situation in which the related terms of CVP cost (Fixed and Variable), volume and profit changes. If changes occur in one term, such as in cost (Variable and Fixed cost independently), its effect or changes, which may be positive or negative, on profit, on sales volumes, on contribution margin, on selling price etc. respectively. It helps the company to maintain its original BEP in the change situation.

Small changes in one factor of CVP can change the BEP or profit or in the other words, BEP or profit is influence in response to the changes in selling price, variable cost and fixed cost, when changes are expected in selling price, in ratio of variable cost factors, or in the amount of fixed cost, an analysis of the cost-volume profit relationship can determine the effect of such changes on period's profit and BEP.

Change effects of Sales Value

The increase in the sale value will results in increase in profit volume (P/V or C.M.) ratio, which result in lowering of BEP sales. On the country a decrease in sales. On the country a decrease in sales value will reduce or decrease the P/V ratio, there by increasing the BEP sales. If sales value is increase and decrease by 10% with other factors remaining constant or assumed to be some it result like below for 2063/64 using assumption 4 (i.e. include both inventory change and other Sundry Incomes):

Table: 4.38
Effect of 10% Increase or Decrease in Sales Value

(Rs. In '000')

Particulars	**Actual**	**Change is Sales Value**	
		10% Increase	**10% Decrease**
Sales	1680354	1848389	1512319
Less: V.C.	1417644	1417644	1417644
Contribution Margin	262710	430745	94675
Less : Fixed Cost	253380	253380	253380
Profit /Loss	9330	177365	-158705
Other Sundry Income	12463	12463	12463
Net Income/Loss	21793	189828	-146242
P/V Ratio	0.1563	0.2330	0.0626
BEP	1541376	1033979	3848514

(BEP $= \frac{\text{FC}-\text{Sundry Incomes}}{\frac{P}{V}\text{Ratio}}$)

Above table shows that with 10% increases in sales, the breakeven point is reduced to Rs.1033979,000 from Rs.1541376000 i.e. Rs.507397000 or 32.92%. Similarly, with 10% decrease in sales value, BEP increased to Rs.3848514000 from 1541376000, i.e. Rs.2307138000 or 149.68%. This shows the inverse relationship between the sales and BEP.

Change Effects on Variable Costs

The increase in variable cost, if it doesn't cause changes in selling price or volume, will lower the P/V ratio and push up BEP. And reduce profit and decrease in variable cost increase the P/V ratio, there by, increasing profit by reducing the BEP sales.

The impact of 10% increase or 10% decrease in variable cost on other factors is shown below, considering the assumption 4 i.e. include both inventory change and other sundry income.

Table: 4.39
Effect of 10% Increase or Decreases in Variable Cost

(Rs. In '000')

Particulars	**Actual**	**Change is Sales Value**	
		10% Increase	**10% Decrease**
Sales	1680354	1680354	1680354

Less: V.C.	1417644	1559408	1275880
Contribution Margin	262710	120946	404474
Less : Fixed Cost	253380	253380	253380
Profit /Loss	9330	-132434	151094
Other Sundry Income	12463	12463	12463
Net Income/Loss	21793	-119971	163557
P/V Ratio	0.1563	0.0720	0.2407
BEP	1541376	3346069	1000902

P/V Ratio $= 1 - \frac{\text{V.C.}}{\text{Sales}}$

(BEP $= \frac{\text{Fixed Cost} - \text{Sundry Incomes}}{\frac{P}{V}\text{Ratio}}$)

Above table 4.39 shows that with 10% increase in variable cost, BEP has increase from Rs.1541376000 to Rs.3346069000. it is Rs.1804693000 or 117.08%. and with 10% decrease in variable cost, BEP has decreased to Rs.1000902000 i.e. Rs.540474000 or 35.07%. Which show that variable cost and BEP sales are positively-related but not proportionately.

Changes in Fixed Costs

Change in fixed cost doesn't influence P/V ratio. So if other factors remain constant, then decrease in fixed cost reduces the BEP and increase the profit. They may fluctuate by reason of changes in the basic structure of the business, operating methods, and discretionary changes in management policy and due to some changes in the external factors.

The below table represents, the impact of 10% increase and decrease, in fixed cost in BEP and profit.

Table: 4.40

Effect of 10% Increase or Decrease in Fixed Cost

(Rs. In '000')

Particulars	**Actual**	**Change is Sales Value**	
		10% Increase	**10% Decrease**
Sales	1680354	1680354	1680354
Less: V.C.	1417644	1417644	1417644
Contribution Margin	262710	262710	262710
Less : Fixed Cost	253380	278718	228042
Profit /Loss	9330	-16008	34668
Other Sundry Income	12463	12463	12463
Net Income/Loss	21793	-3545	47131
P/V Ratio	0.1563	0.1563	0.1563
BEP	1541376	1703487	1379264

P/V Ratio $= 1 - \frac{\text{V.C.}}{\text{Sales}}$

(BEP $= \frac{\text{FC} - \text{Sundry Incomes}}{\frac{\text{P}}{\text{V}}\text{Ratio}}$)

The above table 4.40 presents the 10% increase in fixed cost increases the BEP by Rs.162111000 or 10% (Approx). And 10% decrease in fixed cost, reduce the BEP by Rs.162112000 or 10%(Approx). The 10% increase in fixed cost increase the BEP by 10% and reduction of 10% of fixed cost will end up reducing the BEP by 10%. The slight variation is because of decimal differences. It can be concluded that BEP and fixed cost are proportionately related.

4.9 Operating Leverage of DDC

Operating leverage is a measure of how sensitive net income is to percentage changes in sales. Operating leverage is greatest in companies, which have a high proportion of fixed cost relative to variable costs. A firm with high fixed costs and low variable costs has high operating leverage, the ability of highly increase net income from an increase in sales revenue. In other words, after the breakeven point has been reached, a larger amount of contribution margin will fall to the bottom line in a high fixed cost structure than if the cost structure has been comprised mostly of continuing high variable costs, which continue to eat away at net income after the breakeven point is reached. Of course, the risk is also greater because if the breakeven point is not reached, losses will be greater in the firm with high operating leverage.

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

DOL of DDC for 2063/64 = $\frac{262710}{21793}$ = 12.05Times

The greater the DOL, greater is the business risk. DOL of DDC for the year 2063/64 is 12.05 times, which means, if sales are increased by 100% the net income will increase by 1205%. It is clear that DDC has absorbed more fixed cost to aim to gain more profit. It indicates return efficiency area covers capital structure.

4.10 Manpower Distribution

DDC is employing manpower on two departments, i.e. administration and Technician. The table below shows the manpower in yearly basis without considering the indirect employment provided by the DDC.

From the table below figure shows that there has been constant effort to lay off of the inefficient administrative staff to avoid the unnecessary extra cost on the staffs.

Table: 4.41
Number of Employees Working in DDC Distributed to Administration and Technician

F/Y	Departments	No. of Employees	Percentage of Employment
2059/60	Administration	132	10.3
	Technician	1147	89.7

Total		**1279**	**100**
2060/61	Administration	132	10.3
	Technician	1147	89.7
Total		**1279**	**100**
2061/62	Administration	318	37.11
	Technician	539	62.89
Total		**857**	**100**
2062/63	Administration	318	37.11
	Technician	539	62.89
Total		**857**	**100**
2063/64	Administration	398	41.07
	Technician	571	58.93
Total		**969**	**100**

Source: DDC F/Y 2059/60-2063/64

Administrative staffs were increased to 398 from 132 in the F/Y 2063/64 and skilled technicians were reduced to 571 from 1147.32 skilled technicians were appointed for the proper functioning of the DDC. Every new financial year increased administrative staffs increases economic burden. Aggregate no. of employees decrease in F/Y 2061/62 but in 2063/64 it was increased by 112. These seems like DDC is moving towards right direction in some extent of reducing the extra burden of cost by decreasing no. of unwanted or inefficient employees in last financial year. But negative thing is here, increasing administrative staffs. Like this manufacturing concern, there must be recruit highly skilled technical staffs and efficient managers.

4.11 Ratios that Measures Productivity of the DDC

Productivity refers to the relationship between the inputs and outputs it is the technique that measures efficiency and effectiveness of organization.

Productivity ratios used here is to analyze the productivity of the labour of the DDC. The following ratios are used:

a. Sales per Employee
b. Net Added Value per Employee
c. Labor Equipment Ratio
d. Wage Distribution Ratio
e. Wage Base.

a. Sales Per Employee

$$\text{Sales Per Employee} = \frac{\text{Net Sales}}{\text{No.of Employees}}$$

For 2059/60 = $\frac{1595907000}{1279}$ = Rs.1247777

In F/Y 2059/60, sales per employee was Rs.1247777 in F/Y 2060/61 was Rs.1200790, in F/Y 2061/62 was Rs.1854916, in 2062/63 was Rs.1792697 and in F/Y 2063/64 was Rs. 1734111. *(Appendix – 9).*

Sales per employee are not satisfactory. However, there is a little hope seeing the trend that it is increasing. In last 2 years again it is in decreasing. It should either increase the sales or reduce the number of unproductive employee to further increase the sales per employee.

b**. Net Added Value Per Employee**

Net Added Value Per Employee $= \frac{\text{Net Added Value}}{\text{No.of Employees}}$

Where,

Net Added Value = Sales – (Opening Inventory of raw material + Raw material purchased – Ending Inventory of Raw Material)

Opening and Ending raw material is zero in the case of DDC.

Net Added Value per Employee $= \frac{\text{Sales} - \text{Materials cost}}{\text{No.of Employees}}$

$$= \frac{\textbf{Net Added Value}}{\textbf{No.of Employees}}$$

Table: 4.42
Calculation of Net Added Value

(Rs. In ‘000’0

Particular	2059/60	2060/61	2061/62	2062/63	2063/64
Sales	**1595907**	**1535810**	**1589663**	**1536341**	**1680354**
Less: Material Costs:					
Collection					
Milk Purchased	1112413	1045470	1038124	1044700	1101356
Fuel & Other Provision	27813	28993	33210	40186	43760
Chemicals & Detergents	677	655	660	756	966
Processing					
Skimmed Milk Powder	52816	39657	98229	69783	56144
Raw Materials and Other	1061	1892	2730	3674	4461
Chemicals and Detergents	2476	2983	3593	3476	4049
Fuel and Other Provision	30668	33126	36136	45466	42234
Fodder Purchased	21	19	-	-	-

Total Material Cost	**1227945**	**1152795**	**1212682**	**1208041**	**1252970**
Net Added Value	**367962**	**383015**	**376981**	**328300**	**427384**
No. of Employees	**1279**	**1279**	**857**	**857**	**969**

Source : Extracted from Appendix-1 and Appendix 3-6

The net added value per employee for F/Y 2059/60 was Rs.287695 in F/Y 2060/61 was Rs. 2060/61 was Rs.299464, in F/Y 2061/62 was Rs.439884, in F/Y 2062/63 was Rs.383081 and in F/Y 2063/64 Rs.441057 *(Appendix-9).*

Net added value for employee was also very low. DDC has high material cost. DDC should try to reduce the material cost, increases sales and reduce the unproductive employees to increase the productivity of the labor.

c. Labor Equipment Ratio

Labor Equipment Ratio $= \frac{\text{Net Fixed Assets}}{\text{No.of Employees}}$

Labor equipment ratio for F/Y 2059/60 was Rs.215071, for 2060/61 was Rs.229360, For F/Y 2061/62 was Rs.306792, for F/Y 2062/63 was Rs. 302909 and for 2063/64 was Rs.262274. (Appendix-9)

DDC has distributed fixed Assets into:

- Presently in use.
- Installed but not yet used.

Here, only presently in use fixed assets are considered. Labour equipment ratio is also not in good position.

d. Wage Distribution Ratio

Wage Distribution Ratio $= \frac{\text{Gross Wages}}{\text{Net Added Value}}$

Wage distribution ratio for F/Y 2059/60 was 41.87% for F/Y 2060/61 was 34.60%, for F/Y 2061/62 was 36.29% for F/Y 2062/63 was 59.53% and for F/Y 2063/64 was 36.97% (Appendix-9).

The percentage of wage cost to value added is high in 2062/63. Before and after that DDC seems to have noticed the excess cost on wages and unproductive employees and reduced the number of employees to 969 from 1279. Even though, the wages distribution ratio is not highly satisfactory.

e. Wage Base

Wage Base $= \frac{\text{Gross Wage}}{\text{No.of Employees}}$

Table: 4.43
Calculation of Gross Wages

(Rs. In '000')

Cost Structure	2059/60	2060/61	2061/62	2062/63	2063/64
Collection:					
Salaries	22490	21066	21964	24481	23964
Allowance	2442	2645	5986	3836	5623
Provident fund	1403	1322	1291	1437	1436
Gratuity Exp.	3543	249	2869	-	-
Processing:					
Salaries	34532	33589	33444	39239	38753
Allowance	4815	4520	8820	6675	6675
Provident Fund	1931	1831	1800	2103	2126
Gratuity Exp.	18766	1550	3268	-	22
Selling:					
Salaries	12096	12008	11663	13776	14280
Allowance	2167717	2175	4512	3424	4482
Provident Fund	737	717	684	779	818
Gratuity Exp.	1907	240	2269	-	-
Administration:					
Salaries	29014	27121	25428	33330	30937
Allowance	4332	3828	7550	5501	7434
Provident Fund	1812	1734	1738	2025	2023
Gratuity Exp.	17393	470	-	5091	3185
Add/Less: Additional/Exp.:					
Gratuity Exp.	(5324)	17450	3531	53753	16258
Total	**154056**	**132515**	**136817**	**195450**	**158016**

Extracted from Appendix 3-6

Wage base for 2059/60 was Rs. 120450, for F/Y 2060/61 was Rs.103608 for F/Y 2061/62 was Rs. 159646, for F/Y 2062/63 was Rs. 228063 and for F/Y 2063/64 was Rs.163071. (Appendix-9).

However, with small deduction in 2060/61 than 2059/60 it is still very high enough.

The overall productivity of labor wasn't rough satisfactory. DDC should focus more on the productivity of labor in the coming year as wages constitutes major cost in the overall expenses of DDC.

4.12 Profitability Ratios in Relation to Sales of DDC

Profit is essential for the growth and survival of the business. Without which, no business can stay for too long. Hence it is regarded as the life blood of the business. It is the engine that drives the business and indicates economic progress. Profitability ratios are calculated to measure the overall efficiency of the business. Profitability ratio are calculated with either in relation to sales or in relation to investment.

Here, the profitability ratios in relation to sales are considered. Under which, three ratios are calculated.

- Gross Margin Ratio
- Net Profit Margin
- Operating Ratios

- **Gross Profit Margin**

Gross profit margin is the commonest ratios in operating analysis. It is calculated of gross profit as percentage of net sales. It express the relationship between gross profit and sales and is usually expressed in percentages.

Gross Margin $= \frac{\text{Gross Margin}}{\text{Sales}}$

Gross profit margin for F/Y 2059/60 was 9.70% for F/Y 2060/61 was 9.26% for F/Y 2061/62 was 6.57% for 2062/63 was 10.50% and for F/Y 2063/64 was 11.24% *(AOM Appendix-10).* Higher the gross margin Ratio better is the organization management as it implies that the cost of production of the firm is relatively low. Since DDC has very low Gross Profit Ratio, it is definitely a danger sign to analyze the detailed factors for such cause.

- **Net Profit Margin**

Net profit ratio is the ratio of net profit to net sales. It measures the overall profitability of the firm by establishing the relationship between the net profit and sales. Net profit margin indicates the manager's ability to operate the business with sufficient success not only to cover the cost of production, operating expenses and cost of borrowers fund but also to leave a margin of reasonable compensation to the owners for providing their capital at risk.

Net Profit Margin $= \frac{\text{Net Profit}}{\text{Sales}}$

Net profit ratio for F/Y 2059/60 was -0.29%, for F/Y 2060/61 was 0.1544% for F/Y 2061/62 was -3.040% for F/Y 2062/63 was – 2.99% and for F/Y 2063/64 was 0.555% without considering the other Sundry Incomes *(From Appendix-10).*

Higher the net profit margin, greater is the organization's ability to stand with the adverse economic conditions. Since DDC is operating in negative net profit margin in few financial years. It should consider the detailed reasons responsible for it. However, it seems DDC is on right track, Since from F/Y 2061/62; there has been constant improvement in net profit ratio from -3.040% to 0.555%. it seems from 2064/65, the corporation will be generating good amount of profit according the improvement trend of Net profit ratio of DDC.

- **Operating Ratio**

It is the ratio of operating cost to sales. Operating include cost of goods sold and operating expenses. Operating expenses includes all the selling and administration expenses with the interest on borrowed fund, discount allowed and debts etc.

Operating Ratio $= \frac{\text{Operating Exp.}}{\text{Sales}}$

Operating Ratio for F/Y 2059/60 was 100.29% for F/Y 2060/61 was 99.85% for F/Y 2061/62 was 103.03%, for F/Y 2062/63 was 102.99% and for F/Y 2063/64 was 99.44%, (From Appendix-10).

Lower the operating ratio, higher is the operating profit available for non-operating expenses and funds to pay dividend, create reserves, etc. DDC has been incurring higher operating ratio more than 100% in few fiscal years.

However, there has been gradual decrease in operating ratio. Which is a good sign for DDC.

Even though, the overall profitability of the DDC is very weak and management should focus on all the possible causes and reasons for such situations.

4.13 Major Findings

The findings of this study based on the analysis of data are presented below:

- **Sales**

The corporation's sales trend is in fluctuating but it is in increasing trend. The value of 'r' is greater than 6PE(r) (i.e. 0.3621). It shows that there is a positive correlation between the budgeted and actual sales. Irrespective of the fact that DDC doesn't have a sound system of forecasting.

- **Segregation of Fixed and Variable Cost**

DDC hasn't been practicing CVP analysis till now and there is no method adopted to segregate fixed and variable cost.

- **Variable Cost**

DDC hasn't been segregating mixed cost, even though, care has been taken in this research to differentiate fixed cost and variable cost with the help of degree of variability methods (70:30). The variable cost are too high compared to actual sales. It constitutes

85% in F/Y 2059/60, 85.34% in F/Y 2060/61, 89.21% in F/Y 2061/62 84.74% in F/Y 2062/63 and 84.37% in F/Y 2063/64.

- **Contribution Margin Ratio or P/V Ratio**

DDC has low contribution margin ratio in all the five year under study. The contribution margin ratio for F/Y 2059/60 was 15% for F/Y 2060/61 was 14.66%, for F/Y 2061/62 was 10.79% for F/Y 2062/63 was 15.26% and for F/Y 2063/64 was 15.63% At least DDC should have 20% P/V ratio to recover fixed cost *(Drury; 2000).*

- **Fixed Cost**

The corporation has high fixed costs, be it salaries, or depreciation, interest on loan provident fund, gratuity expenses, etc. having maximum of 15.63% P/V ratio, among the five fiscal years, fixed cost to sales percentage under four different assumptions in five years are:

Assumption-1 & 2
Exclude inventory change but include other sundry incomes and exclude both inventory change and other sundry incomes is to percentage of fixed cost to sales in F/Y 2059/60 was 15.41% considering Assumption 1 and 2, in F/Y 2060/61 was 14.41%, in F/Y 2061/62 was 13.77%, in F/Y 2062/63 was 18.52% and in F/Y 2063/64 was 15%.

Assumption-3 & 4
Include inventory change but exclude other sundry incomes and include both inventory change and other sundry incomes. And considering assumption 3 and 4. Percentage of fixed cost to sales for F/Y 2059/60 was 15.29% for F/Y 2060/61 was 14.51%, for F/Y 2061/62 was 13.79%, for F/Y 2062/63 was 18.25% and for F/Y 2063/64 was 15.08%. At least, DDC should have 20% P/V ratio to recover the fixed cost.

- **Inventory Policy**

DDC has high wages. The reasons may be; availability of manpower is more than requirement or inefficiency of the workers resulting in low productivity of labour.

- **Inventory Policy**

The corporation has no effective inventory policy. Whatever, left over of production is considered as inventory. The inventory production ratio is not constant. The wide fluctuation are seen during the five fiscal year, there was Rs.25862,000 increase in inventory in F/Y 2059/60, Rs. 19543 decrease in inventory in F/Y 2060/61, Rs. 4005000 decrease in 2061/62, Rs.57063080 increase in F/Y 2062/63 and Rs. 6952000 decrease in inventory in the F/y 2063/64.

- **Profitability in Relation to Sales**

Profitability in relation to sales is also too low in the five fiscal year (i.e. F/Y 2059/60 to F/Y 2063/64). Gross margin is very low. Net margin is negatively low in few fiscal years. Operating costs constitutes more than the sales value in all the five years.

- **Breakeven Sales**

The breakeven sale was more than the sales in F/Y 2059/60 (Except assumption 1 and 4), in F/Y 2061/62, in F/Y 2062/63 considering all the four assumptions. In F/Y 2059/60, while excluding inventory change and including sundry incomes (assumption 1) and including both inventory change and other sundry incomes (assumption 4) is less than sales, leading to a profit of Rs.8931871 (Assumption 4). And the margin of safety yielding Rs. 46507000 (assumption 1) and Rs.59920000.

In F/Y 2060/61 and in F/Y 2063/64. Considering all the four assumptions, Breakeven sales was less than sales. Leading profit by Rs. 14117,594 in F/Y 2060/61 and by Rs.14702495 in F/Y 2063/64 (Assumption 4) and the margin of safety giving Rs. 105107000, Rs. 26356000, Rs. 15974000, Rs. 94725000 for four assumptions respectively for F/Y 2060/61. Like that Rs. 142126000, Rs.62389000. Rs. 63080000 and Rs. 138978000 for four assumptions respectively for F/Y 2063/64.

CHAPTER - V
SUMMARY, CONCLUSIONS & RECOMMENDATIONS

5.1 Summary

Profit planning and control is an important approach developed for facilitating effective performance of management system mainly in profit-oriented enterprises. And management is the key element, which controls overall aspects of the organization for the overall efficiency.

It is the ultimate objective of management to maximize profits over the long term, consistent with its social responsibility.

CVP analysis is among the most important tool in the profit planning and control process. It is a device used to determine the usefulness of the profit planning process of the firm. In fact, the entire field of profit planning has associated with the CVP interrelationships. CVP analysis helps to determine the minimum sales volume to avoid losses and the sales volume at which the profit goal of the firm will be achieved. As an ultimate objective, it helps management in seeking the most profitable cost and volume. A dynamic management, therefore, use CVP analysis to predict and evaluate the implications of its short-run decisions about fixed cost, variable cost, volume and selling price for its profit plans on a continuous basis.

CVP analysis is a way to quickly answer a number of important questions about the profitability of a company's products or services.

The performance of almost all public enterprises is not satisfactory. They are incurring losses year after year and DDC is not apart from this. The main causes of losses are:

- Lack of sound system of forecasting
- CVP analysis not applied.
- High fixed cost by over staffing.
- Low productivity of labour.
- Shortage of effective inventory policy
- High fluctuation is sales.

Some other reasons might be:

- Ambiguous goals and objectives.
- Inadequate knowledge and use of PPC.
- Govt. intervention in decision.
- Lack of co-ordination and communication between departments.

DDC, being public enterprises, started with the aim of providing services to the urban peoples by producing and supplying milk and dairy products and also improving the economic conditions of rural people by promoting livestock occupation.

The main objective of the present research was to analyze CVP analysis in relation to DDC. It has observed that, even though, holding large market shares, DDC has been incurring losses year after year. But in this study except in 2062/63, in which it got losses of Rs.25,541,921 remaining 4 fiscal years succeed to earned profit. Which is very good signal for better future.

As per study, primary and secondary data are analyzed with historical and descriptive approach for sales, cost, inventory, productivity ratios, profitability ratios, contribution margin analysis, P/V ratio analysis, BEP analysis, etc, are used. The Data used are evenly distributed, tabulated, wherever necessary.

From the analysis, it shows that DDC has low contribution margin, low P/V ratio, high BEP sales (less than actual sales), except in 2059/60, 2060/61 & 2063/64. The sensitivity analysis showed that increase in cost, increases BEP while decrease in cost, decreases BEP which shows that cost and BEP are positively correlated whereas the relationship of sales to BEP are negatively correlated.

DDC profit situation is improving. In the year 2059/60, 2060/61, 2061/62 &2063/64 DDC has generated profit. But, if omit inventory change and other sundry income, BEP is more than actual sales.

The distribution of operation of Dairy in various districts and lack of detailed information regarding the cost structure and wide varieties of products with little knowledge of PPC seems to be the main causes of not practicing CVP analysis by the DDC.

5.2 Conclusions

On the basis of the different analysis, observations, and informal discussions, etc, resulted in the following conclusions:

- DDC has been planning only on short-term basis
- The goals and objectives of the corporation are ambiguous to the lower level of employees. There is a wide fluctuation in the targeted sales and actual achievements.
- The practice of CVP analysis has not been used yet.
- There is no practice of segregating cost into fixed and variables.
- DDC has low contribution margin with high variable cost.
- DDC has also high fixed cost with low contribution margin, resulting in high BEP sales.

- There is no effective inventory policy. If production exceeds sales, then it is considered as inventory. Otherwise, there is no such inventory policy followed which result in high fluctuation in inventory.
- The availability of manpower is more than its requirement, resulting in overstaffing, and confusion of delegation of authority and responsibility, which caused low productivity of labor.
- The profitability of the DDC is also very poor.
- All these causes are affecting DDC's high fluctuating sales revenues, low p/v ratio, high v/c ratio, too low profitability ratios and low productivity ratios of labour.

5.3 Recommendations

On the basis of this study, the following recommendations are expected to be fruitful to the management of the corporation and other concerned offices:

- First and foremost, DDC should clearly define its objectives into long-term goals and short-term goals.
- Secondly, the delegation of authority and responsibility should be clear among the different levels of management.
- There should be separate planning and control department. The trained and qualified planning experts should be recruited or hired and all the employees should be well trained.
- DDC should consider demand, market study and also consider the price, supply and other policies of private dairies while making the tactical plans.
- DDC should also revised and study its own products. The unproductive products should be dropped or if needed, revised the price of the products.
- Variance analysis should be made to dig out the cause of unfavorable variance and timely correct them.
- BEP analysis should be done while planning and segregating the cost.
- DDC should lay off unproductive employees who are causing extra burden of cost in the form of salaries, provident fund and gratuity expenses.
- DDC should also consider the variable costs. It should reduce as much as it can so as to increase contribution margin ratio.

- DDC should also consider in buying new production plant that might reduce the unproductive employees and the over-utilization of old plant, resulting in less investment in repairs and maintenance on such assets.

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