

# CHAPTER I

## INTRODUCTION

### **1.1 Background of the Study**

Nepal is developing country with a very small number of industrial sectors. Its economy is based on agriculture. For the rapid development of developing nation like Nepal, development in agriculture sector is not sufficient. It is essential to develop industrialization too. Industries have an important role to play in accelerating the rate of economic development. Industrialization has certainly been associated with growth but it is not only courses of growth. At certain stage of country's development, the highest returns may come from manufacture of agriculture products or services. How to use resources at any time depends on market prospects and costs. So, the interesting question is not, how fast a country can be industrialized, but how incentive and policy can be designed so that few industries make the maximum contribution to the country's development, where must be applied suitable and effective management system.

Inventory is one of the most assets to many organizations. Large percentage of the total capital is invested in inventory. Inventory is vital element in the efforts of the firm to achieve desired sales.

Inventory management involves planning of the optimal level of inventory and control of inventory cost supported by an appropriate organization structure, which is staffed by trained persons and directed by top management. It involves both financial and physical dimension and these dimensions are interrelated and cannot be looked in isolation. Much business became failure due to improper management of inventory. To produce any

goods or service, it requires many types of material, direct or indirect. If the company did not get the required materials at needed time then production system may be disturbed and fails to produce and sale required quantity of products. Keeping more inventories will be expensive, as it needs large amount to invest in inventory. Large amount of inventory will also increase cost associated with inventory where as keeping minimum level will create the problem of shortage. Therefore inventory management plans for required quantity of different types of inventory, required period and cost associated in it.

The industrialization process had started very late in the country. The actual process of industrialization began since 1936 only after the establishment of Council of Industry. The company Act was also passed in the same year.

The private sector was reluctant to establish huge industries due to various constraints like requirement of substantial amount of fund, requirement of high-tech expertise, lack of attractive profit opportunities, limited size of the market and involvement of high risk. To accelerate the process of industrialization and to play catalytic role to promote economic growth, most of the public enterprises of Nepal were set up mainly through foreign assistance in the 1960s and 1970s.

## **1.2 Introduction of Chaudhary Group Industry Pvt. Limited (FUDCO)**

Chaudhary Group is one of the largest private business houses in Nepal having diversified interest across various sectors. Team of highly qualified and experienced professionals manages the company professionally. It has

stepped into Noodles business world in 2042 B.S by establishing Wai Wai noodles factory (FUDCO complex) at Bhainsepati, lalitpur, Nepal.

It has world class manufacturing facilities of Noodles, Snacks & Beverages and cigarettes. In this present scenario its brands like WAI-WAI and Kwiks cheese balls are the market leader in their segment and a household name not only in Nepal, India & Bhutan but also in the fast growing markets around the world.

By virtue of its world-class quality & unique taste, CG's noodles & snacks have also been successfully accepted in the markets of European Union Countries like UK, Austria & Germany. They are spreading their wings to neighboring countries and India seems to be the preferred destination. It has launched a new consumer coupon scheme in Wai Wai Noodles for domestic market. To celebrate 20 years of Wai Wai in Nepal, CG introduces 3 new variants of Wai Wai under the brand name Wai Wai mutton and Wai Wai Tenz.

With an investment of Rs 50 corer (Rs 500 million) for the two units – CG group expands its business by opening its branch in new location like one in Sikkim and the other in Uttaranchal – Wai Wai is being launched in India by CG Foods India, a subsidiary of the Singapore based innovation group, which has a technical collaboration with the Chaudhary Group.

In Nepal, the company's food business, which accounts for 20 % of total business, includes fruit juices under the brand name Rio, biscuits and other products.

CG had established following industries in following year:

- ) Shree Pashupati Biscuit industries Pvt. Ltd- 1973A.D
- ) Shree Mahalaxmi Maida Mills Pvt. Ltd-1974A.D

- ) CG foods (Nepal) Pvt. Ltd(FUDCO Complex)-1984A.D
- ) CG House, Sanepa- 1984A.D
- ) Chaudhary Udyog Gram (CUG)-1994A.D
- ) Nirvana Vanaspati Udyog Pvt. Ltd- 1988A.D

By establishing Shree Pashupati Biscuit Industries Pvt. Ltd in 1973 A.D, CG entered in Food & Beverage Industries. Now CG is popular by the brand name like Wai Wai instant Noodles and Kwik, Snacks foods.

**Noodles Industry** is a place where the noodles are produced; rice and wheat are among the chief crops and also the main ingredients for producing instant noodles. For fried instant noodles new industrial technologies involving the utilization of vacuum mixers, steam chamber upgrades, modification of dough recipes, noodle steaming conditions, and dough mixing technologies were adopted.

An instant noodle was launched for the first time in the country two decades ago. It definitely took some time to make a space in our households. While Urban population gradually started accepting it as one of the best packaged food – since it could serve as snacks as well as good meal – suburban population were found to be hesitant to accept it Kudos to great marketing strategies by noodles industries and awareness among people, now instant noodles play a vital role in every household across the country. As noodles industry has grown in the market reaching around four hundred corer turnover annually, it is one of the most organized and largest industries in the country. While there are many players in the market now, each company

produces a number of varieties under different brand names. Instant noodles now find a substantial place in every kitchen.

### **1.3 Significance of the Study**

Inventory management is one of the important functions in any organization. Without an effective & efficient inventory management, no organization can achieve goals. Proper inventory management helps to maximize profit of the firm. A slight change on the cost of materials will bring about a great change in the company's profitability. So a company should maintain adequate stock of raw materials to fulfill market demand. Because of limited resources, industries in developing countries are still using traditional techniques in purchase of inventory. Most of Nepalese Manufacturing companies are the victims of poor inventory management. FUDCO is also not free from this obstacle. This study is concentrated on the problems faced by company in the area of inventory management. It can be hoped that eliminating the obstacles likely to be faced in future would satisfy FUDCO. It will also help to improve the quality of the product to increase its market. Considering the current situation of FUDCO, it is felt necessary to evaluate the inventory management system they are applying currently and improve it.

### **1.4 Objectives of the Study**

The objective of the study is to find the present position of inventory management and its impact on profitability of Chaudhary Group. Other objectives are:

- ) To identify the techniques used to acquire and to manage the inventories by FUDCO.
- ) To examine the profitability & efficiency of FUDCO Group due to inventory management.
- ) To analyze the different aspects of inventory management in FUDCO with the help of statistical & financial tools.
- ) To provide logical suggestion for improvement on the basis of the study diagnosis.

### **1.5 Limitations of the Study**

The study has certain limitations due to lack of sufficient time and resources.

They are as follows:

- )The study has been carried out within a range of latest data starting from fiscal year 2055/56 to 2064/2065.
- )The study has been limited to the area of the inventory management system and its impact on profitability of FUDCO and has not covered other areas.
- )This study is basically conducted depending upon financial statements of Food and Production Complex of Chaudhary Group, economic survey etc.

### **1.6 Organization of the Study**

The whole study has been divided into five chapters.

First is introduction chapter, which includes general background, Statement of Problem, Objectives of Study, Scope of Study, Limitation of Study and Organization of the study.

The second chapter has covered the fundamental concept and components of inventory management and review of previous research work.

The third chapter has described the methods followed to achieve the objectives of this study. Moreover, this chapter explains the research methodology employed to conduct the study and tools and techniques used in analysis of data. This chapter includes research design, sources of data, method of data analysis etc.

Fourth chapter explains to the data presentation and analysis, scoring the empirical findings out of the study through definite sources of research methodology.

Fifth and last chapter has provided summary and conclusions based on facts found so that the complete picture of the study can be understood in short form. Similarly, recommendations have also been provided.

Beside these Bibliography and Appendices are also presented at the end of the thesis.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

This chapter deals with the review of conceptual framework relating to INVENTORY MANAGEMENT. Besides, some of the various studies made on inventory management are reviewed for this study. This chapter is devoted to present the co-related literature of the research.

#### **2.1 Theoretical Concept**

Inventory is one of the most assets to many organizations. Large percentage of the total capital is invested in inventory. Inventory is vital element in the efforts of the firm to achieve desired sales.

Inventory management involves planning of the optimal level of inventory and control of inventory cost supported by an appropriate organization structure, which is staffed by trained persons and directed by top management. It involves both financial and physical dimension and these dimensions are interrelated and cannot be looked in isolation. Much business became failure due to improper management of inventory. To produce any goods or service, it requires many types of material, direct or indirect. If the company did not get the required materials at needed time then production system may be disturbed and fails to produce and sale required quantity of products. Keeping more inventories will be expensive, as it needs large amount to invest in inventory. Large amount of inventory will also increase cost associated with inventory where as keeping minimum level will create the problem of shortage. Therefore inventory management plans for required

quantity of different types of inventory, required period and cost associated in it.

Any stock that a firm keeps to meet its future requirement for production and sales is called inventory. The basic reason for holding inventory is to keep up the production activities unhampered. Inventories are a part of current assets, which are used within one year, in the normal course of business operation. Manufacturing organization's inventory includes raw materials, work-in-progress, finished goods, spare parts, supplies etc. Therefore combination of raw materials, work-in-progress, finished goods and supplies is called inventory. Managing the stock at lowest cost is called inventory management. In other words, the planning, coordinating, and controlling activity related to the flow of inventory into, through, and out of an organization is known as inventory management.

### **2.1.1 Types of Inventories**

Manufacturing firms generally hold four types of inventories (*Saradhi, 1982: 31*)

#### **Raw Materials**

Material consists of items that firms purchase for use in its production process. It may consist of basic materials and/or manufactured goods. Maintaining adequate raw materials inventories provide a firm with advantages in both purchasing and production.

Knowing that there will be adequate stocks of raw materials available when needed permits the production department to meet production schedules. Thus, there are a number of valid reasons why a firm's purchasing and

production departments want to maintain large inventories of raw materials. In manufacturing company, raw materials involve those inputs/components, which are converted into final product through manufacturing process. For example in Tobacco industry, tobacco is the main and vital raw materials. Inventories sizes are large and small. It depends upon the nature of the company. Such as inventories in tobacco industry are larger because of the curing process. Inventories in gas and oil production are low, because raw materials and goods in process are small in relation to sales. In the canning industries inventories are average because of the seasonality of the raw materials. Inventories are small in baking because of the perish ability of the final product. In the context of Udayapur Cement Industry Limited, it has used following raw materials: Lime Stone, Clay, Coal, Gypsum, Iron ore and Packing bags

### **Work-in-Progress**

Goods partially worked on but not fully completed are work -in-progress inventories. WIP Inventory consists of all items that are presently in the production cycle at some intermediate stage of completion. For example they may be in transit between operations or; they may be currently undergoing some type of operations; awaiting the next step in the production cycle.

WIP inventories are a necessary part of modern industrial production systems, since they give each operation in the production cycle, a certain degree of independence, firm's production department will want to maintain reasonable WIP inventories to minimize cost delays and idle time. In general, larger the firm's production cycle, the larger it's WIP inventories.

A WIP inventory is neither a final product nor a raw material. It is middle of raw materials and finished goods. WIP inventories are strongly influenced by the length of the production, which is the time between placing raw materials in production and completing finished products. One problem is faced to separate raw materials, WIP and finished goods. It depends on nature of production. For cement Industry, cement is the final product. But a bridge constructor Company uses this cement as a raw material. Such as iron bar, electric wires are also raw materials for another company.

### **Finished Goods**

Finished goods inventory consists of those items that have completed the production cycle and are available for sale. Keeping enough finished goods inventories on hand provides significant benefits for both the marketing and the production departments. From marketing's perspective, large finished goods inventories enable them to fill orders promptly, minimize lost sales and avoid shipment delays due to stock outs. From production's point of view, maintaining a large finished goods inventory permits items to be manufactured in large production runs, which helps to keep unit production costs low by spreading fixed set-up expenses over large volume of output(*Moyer,McGuigan & Kretlow,1999:517*).

### **Supplies, Stores and Spares**

This type of inventory is also very important for the manufacturing enterprises as above included 3 types of inventory.

### **2.1.2 Objective of Inventory Management**

According to the Indian Association of Materials Management, 64paise on labor and the rest of one rupee of cost is spent on overheads (*Goal, 1997: A-69*). So the objective of inventory management is to give more emphasis on the material management that reduce the cost of production and improve the profitability. Studies by experts in this field have brought out that if an organization can affect 5% savings in material cost, it would be as good as increasing the production or sales by about 36%.

On the other hand, the management should try paying adequate attention to the inventory management to reduce the cost of production and working capital requirements. In fact, an uncontrolled inventory can become industrial unit's cancer.

Two levels of inventory control exist: quantity or unit control and rupee or financial control. Production executive and storekeeper are primarily interested in quantity control. On the other hand, financial executives are interested that too much money should not be invested in inventory and every rupee spent in inventory should be efficiently and effectively utilized. Firm should always avoid over-investment or under-investment in the inventories. An optimum level of inventory should be determined on the basis of the trade-off between costs and benefits. The main objective of inventory management is to minimize the total cost and maximize the profit of the companies. It can be summarized up as follows:

a) Availability of all items of inventory: There should be a continuous availability of all types of inventory in the factory. The main objective of inventory management is to maintain required inventory in needed time so that production process will take place smoothly.

b) Minimization of risk of under and over stocking: If the factory keeps inventory without proper analysis, then there will be chances of over stocking, which will increase the cost of carrying inventories. Under stocking of inventories create problem in smooth operation of business.

c) Reasonable price: While purchasing the raw materials, the firm should be strict on the pricing the raw materials. It should be reasonably low priced, but we don't distribute the quality by keeping lower prices materials. Firm should adjust between price of the raw materials and its quality.

d) Minimum wastage: There should be minimum wastage of materials while storing in the warehouse by the workers. Wastage should be allowed up to a certain level known as normal level of wastage and it shouldn't exceed that level. Storekeeper and workers should be trained to handle the materials in a scientific way to avoid the wastage.

e) Risks of spoilage and obsolescence of inventory must be avoided. For this purpose, a maximum quantity of each item of inventory is determined and a proper method of issue of inventory is followed. LIFO and FIFO method is generally used to issue the inventory.

f) Information about availability of stock should be made continuously available to the management so that planning of production may be done. The storekeeper can supply this information because he keeps an up-to-date record of every item of stocks under a proper system of inventory control.

g) Internal checking of inventory of raw materials and finished goods should be done which is a part of inventory control.

### **2.1.3 Aspects of Material Management**

Material management is the most essential part of the manufacturing organization. In practice, executives don't pay attention to the material management. Therefore many organizations have failed to achieve the objectives. Effective material management ensures optimizing materials productivity. There are eight primary and seven secondary objectives that can ensure the best performance and use of materials in an organization. 'Material management provides an integrated systems approach to the coordination of materials activities and the control of total materials costs' (*Doubler and Burt, 1996:79*)

Overall objectives of materials management

1. To develop a system of supplies whereby there will be right quantity of stock of items properly stored, easily retrievable and distributed close to the points of usage, whenever required, at a given time. In case, there is no enough stock, the work in the organization may have to be stopped and the men and machines will remain idle. On the other hand, if there is overstocking of raw materials, it will unnecessarily block capital in inventories.
2. The reduction in inventory costs- both carrying costs and ordering costs.
3. To ensure that the resources available are used most effectively and the stores are purchased at most economical price consistent with the quality.

4. To bring about coordination among the various sections in the organization, i.e. in a company to bring coordination among the financial manager, production manager and marketing manager.
5. To ensure that the production doesn't suffer.
6. To ensure that the sale of finished goods is not affected.
7. To avoid wide fluctuations in production.

Most of the manufacturing and government companies do not give more attention in material management, but that is most important task. Most of the organizations have found that they are either suffering because of heavy inventory or because of non-availability of certain materials in the inventory. Therefore more emphasis has to be given to encourage the use of inventory management systematically to ensure the best use of inventory.

#### **2.1.4 Need/Importance/Benefits/ of Holding Inventories**

There are many benefits of holding inventories. A firm has to keep enough inventories not least. Inventories are used to provide cushions so that the purchasing, production and sales functions can proceed at their own optimum paces. In achieving the separation of these functions, the firm realizes a number of specific benefits (*Hampton, 1986:271-273*).

##### **I. Avoiding Losses of Sales**

If the firm doesn't have finished goods available for sale, it will lose sales. There is much competition in the market. Customers will purchase from that firm who gives immediate delivery. The firms have to compete with another firm who transact the same goods. So, the ability of the firm to give quick

service and to provide prompt delivery is closely tied to the proper management of inventory.

## **II. Gaining Quantity Discount**

If a firm is willing to maintain large inventories, it may be able to make bulk purchase of goods at large discount. By obtaining large discount the firm's profit may increase as long as the costs of maintaining the inventories are less than the amount of discount. E.g. If cost of storing an item is estimated at \$1 and discount is \$3, the firm benefits by \$2 per unit from the quantity discount.

## **III. Reducing Ordering Costs**

A firm places an order when it is necessary. It incurs certain costs such as transportation, insurance, inspection, stationary, bank expenses etc. The total ordering cost may reduce if the firm places an order at fewer times. It actually takes a lot of money. So few order must be placed, so that ordering cost may reduce.

## **IV. Achieving Efficient Production Runs**

It is necessary to continue the production run. A firm must keep enough raw materials. If the set-up cost is \$200 and run produces 200 units, the production run cost per unit is \$1. A longer run of 2000 units would reduce the set-up cost to \$0.10 Inventories assist the firm in making sufficiently long runs to achieve efficient production.

A company should maintain adequate stock of materials so that it is possible for a company to procure raw materials. Procurement of raw materials may be delayed because of strike, transport disruption or short supply. Therefore

the firm should maintain sufficient stock of raw materials at a given time to have continuous productions.

### **2.1.5 Structure of Materials Management Organization**

In a manufacturing organizations i.e. Departments, Corporations and Companies engaged in manufacturing and sale of goods, there should be a full-fledged department dealing with materials management. Departments may be divided into the following sections (*Goel, 1999: 427*).

- i. Materials policy-making, planning and programming
- ii. Purchasing
- iii. Inventory Control
- iv. Receiving
- v. Warehousing
- vi. Store-keeping
- vii. Material handling and
- viii. Scrap and surplus disposal.

### **2.1.6 Purchase Management**

In narrow sense, purchasing refers merely to the act of buying an item at a price and in broader sense purchasing makes it a managerial activity that goes beyond the simple act of buying and includes the planning and policy activities, research and development, service selection etc. Management suggests that purchasing decisions involve in the weighting of alternatives

possibilities, and many of these alternatives involve the influence of other functions on the purchasing decisions. A good purchase management has played important role in the manufacturing companies. We may give more attention in the purchasing of raw materials, supplies and equipment. We should purchase raw materials and supplies in the right quantity, of the right quality, from the right origin, at the right time and cost. Purchase management should be effective, otherwise it hampers in the quality production. So, we give more attention on purchase management. The scarcity of raw materials hamper in production on time. Purchasing department should take greater responsibilities and should analyze the existing procurement policy and should tune with the overall organizational objectives and polices. The efficiency of any business activity depends upon having materials, supplies and equipment available in proper quantity with proper utility at the proper place and time and the proper price.

#### **2.1.6.1 Importance of Purchasing**

Purchasing management reflects the role of purchasing in corporate operation and organization. Purchasing is still a clearly identifiable function in most business organization. No organization can operate without materials supplies and equipment. The efficiency of any business activity is contingent upon having material, supplies and equipment available in proper quantity with proper quality, at proper place and time, and at the proper price.

### **2.1.6.2 Objectives of Purchasing**

Providing the people to select the materials, supplies and services in an appropriate and fair price is the objectives of purchasing. Purchasing objectives is to buy materials and service of the right quantity, in the right quality at the right price from the right source at the right time in the word of Doubler, Lee and Burt (*Doubler and Burt, 1999: 15*).

In general management terms, there are eight basic objectives of purchasing:

1. To support company operation with an uninterrupted flow of materials and service.
2. To develop reliable alternative sources of supply.
3. To develop good vendor relationships and good continuing supplier relationships.
4. To buy competitively and wisely.
5. To keep inventory investment loses (due to deterioration, obsolescence and theft) at a practical minimum.
6. To achieve maximum integration with other departments of the firm.
7. To train and develop highly competent personnel who are motivated to make the firm as well as their department succeed.
8. To develop policies and procedures, which permit accomplishment of the preceding seven objectives at the lowest reasonable operating cost.

### **2.1.6.3 Purchasing Approach**

Under the purchasing approach there are various purchasing method, which are as follows (*Garrett and Silver, 1986: 374*):-

### **a. Hand to Mouth Buying**

Under this approach, materials are purchased to meet immediate needs only. This approach is followed when the market price of the required materials is above average and likely to fall or actual requirements of the company are uncertain. The objective of this approach is to minimize inventory level due to expected fall in prices.

### **b. Averaging Down**

This approach of purchasing aims to obtain the benefit of price dips. In other words, purchasing is down in every price falls. If handled successfully, it is possible to keep the cost below the average market price.

### **c. Forward Buying**

When the purchaser forecasts his future needs and purchases the required goods in economic quantities to meet those need, then this policy is forwarded. When price is relatively stable overtime or when only moderate price increases can be anticipated, then this approach is often used. This approach is used to take advantage of economically large volume purchases.

### **d. Speculative Buying**

Under this method, purchase is made in excess of needs of the items when a market price is low. This purchasing helps the company to save the money in purchasing and to generate profit on sales. Hence speculative buying seeks to make a possible profit by purchasing materials in anticipation of price rises.

### **e. Reciprocal Buying**

According to this approach, the firm agrees into a contract to buy and supply materials from each other. It is difficult to set a hard and fast rule as the advisability of such agreement.

### **f. Local Buying**

Sometimes, uneconomical materials are to be purchased from local supplier. Especially in the area where degree of industrialization is low, this is done to build good public image.

### **2.1.6.4 Purchasing Principle**

Followings are some of the important principles of purchasing:

1. The acceptance of order is too specific and not implicit preferably either side should  
Acknowledge this before it is binding.
2. Ambiguity and misinterpretation should be avoided especially in respect of quality,  
Delivery, service, discount or any other such changes.
3. The supplier takes warranty of goods as per specifications laid down in tender and not whether these are fit of intended use. It is so required that the detailed information has to be stipulated well in advance or through negotiations has to be stipulated.
4. The other features are buyer's right to reject unwanted goods, liquidation for damages, passing of ownership etc, are covered in legal aspects.

### **2.1.7. Cost Basis for Inventory Valuation**

The primary basis of accounting for inventory is cost, which has been defined generally as the price paid or consideration given to acquire an asset. As applied to inventories, cost means in principle the sum of applicable expenditures and charge directly or indirectly incurred in bringing an article to its existing condition and location (*AICPA, 1991:28*).

Conceptually, the value is determined by the process of multiplying physical quantity of goods by cost per unit. But in practice many organizations purchase different types of raw materials at different time. Price of materials remains change from time to time. Many types of raw materials remain in stock. It isn't always possible to identify the individual particular purchase group. At that situation, firms have faced difficulties in valuing the inventory. In this situation, there are many methods, which are based on historical cost, used in determining the values of inventory. They are:

#### **a) Specific Identification Method**

The specific identification method requires that each unit of inventory be identified with the particular time it was purchased. In these methods, the items serial numbers are distinguished by model, colors or size to identify the particular items but specific items are separated at first and are recorded in stock book. This method is more suitable to low volume, high cost item such as automobiles. It is not very practical when the firm purchase large quantities of identical units at various times and prices.

#### **b) Weighted Average Cost/ End-of the Month Method**

It assumes that goods are removed from the beginning inventory and purchase group in proportion to the number of units in these groups.

Consequently, cost of the ending inventory also represents a proportional distribution from the beginning inventory and the various purchase groups. The weighted average cost is computed by dividing the total cost of goods available for sale by the total no. of units available for sale during that period (*Eugene, 2003: 440-444*)

$$\text{Weighted average} = \frac{\text{Total cost of goods available for sale}}{\text{Total units available for sale}}$$

This method is widely used by organizations that hold items of inventory for long periods of time because it averages out of the effects of price increases and decreases. In addition, weighted averaging process is satisfactory when there are both increases and decreases in cost within the accounting period. Some organization uses this method, which purchase the inventory items at frequent interval because it doesn't require that the ending inventory cost be associated with any particular purchase group. A common criticism of the methods is that it attaches no more significance to current price than to price that prevailed several months earlier.

### **c) First- In- First Out (FIFO) Method**

FIFO method assumes that the oldest items on hand are sold first. Each sale is made out of the oldest goods in stock; the ending inventory therefore consists of the most recently acquired goods. During the period of rising prices, these methods will result in a lower inventory than would be assigned under the average cost method. FIFO is the most commonly used method for valuing inventory. It is simple to use and appear to coincide with established merchandising principle of selling the oldest items first.

#### **d) Last- In- First Out (LIFO) Method**

This method assumes cost flow is exactly the opposite of FIFO method. The title of the method assumed that the recent items purchased are issued first. Consequently, the ending inventory consists of the oldest unit in hand, cost of the latest purchased materials will be co-assigned to the first materials issued, until they are exhausted, then the price of the proceeding lot is used and so on. Materials are issued at cost approximating current market prices but inventories tends to be valued at the oldest lots on hand giving price, which is out of date with current invoice prices.

This method has become popular since the procedure became an acceptable method for determining the income taxes, unlike weighted average if the inventory is less than the beginning inventory. In such a case, the firm must be able to identify the oldest remaining items for inventory valuation purposes.

#### **e) Standard Cost Method**

LIFO, FIFO and Average Cost Method are often hard to work within the subsidiary records for materials under a perpetual inventory system. For this, standard cost method may be used in accounting for individual items in materials inventory. This method charges materials unit into the factory at a pre-determined budgeted or estimated price reflecting a normal or expected future prices.

#### **f) Base Stock Method**

According to this method, a certain constant quantity or base stock of materials is assumed to be necessary to keep the concern going. The base is

valued at the cost prevailing at the time from beginning or when the method was adopted. Any additional layers of materials in the inventory at cost beyond the unit, the base may be cost on the basic of FIFO, weighted average etc. method.

All the methods have their advantages and disadvantages. However, the method chosen must be significant for efficient inventory management especially in its financial dimensions.

## **2.2 Analytical Method**

### **2.2.1. Inventory Management Techniques**

In inventory management techniques, we seek how to minimize the inventory cost. Adequate inventory facilitates smooth production activities. On the other hands, excessive inventory is idle resources of the firm and the large amount of money is blocked unnecessarily. According to Atton N. Smith “Inventory is money on which a company pays interest rather than collects interests. It is money always in danger of devaluation. Every firm should have an optimum level of inventory or optimum balance level between too much inventory and too low inventory. Some of the inventory management techniques to solve inventory management problem faced by most of the manufacturing firms are:

#### **2.2.1.1 Economic Order Quantity (EOQ)**

One of the major inventory management problems to be re-solved is how much inventory should be added when inventory is replenished. If the firm is buying raw materials, it has to decide lots in which it has to purchase on

each replenishment. If the firm is planning a production run, the issue is how much production to schedule. These problems are called order quantity problems, and the task of the firm is to determine the optimum or EOQ. Determining an optimum inventory level involves two types of costs (a) Ordering Cost and (b) Carrying costs. The economic order quantity is that inventory level, which minimizes the total of ordering and carrying costs. We can compute EOQ with the help of forecasting usage, ordering and carrying costs. In EOQ calculation, we must use marginal cost only and should not include fixed costs.

**Assumption of EOQ: -**

The EOQ model, as the techniques to determine the economic order quantity, explained by us, is based on three restrictive assumptions:

- (a) The firm knows with certainty the annual usage of a particular item of inventory.
- (b) The rate at which the firm uses inventory is steady overtime.
- (d) The orders placed to replenish inventory stock are received exactly at that time when inventory reaches zero.

In addition, it may also be assumed that ordering and carrying cost is constant over the range of possible inventory levels being considered.

**Approaches: -**

The EOQ model can be illustrated by i) the long analytical approach or Trial and Errors Approach ii) Formula Approach and iii) Graphic Approach

### **i) Trial and Error Approach**

While determining the EOQ by trial and error technique, the following steps are to be undertaken

- a) Determining total costs for each lot size chosen
- b) Selecting the ordering quantity, which minimizes total costs?

Example: -

Annual demand = 100 Units

Price per unit = Re. 1

Carrying cost = 20% of average inventory value

Cost per order = Rs. 10

Now, applying the techniques, optimum economic quantity can be determined for no. of orders 1,2,4,6 and 8 in this way:

**Table No.: 2.1**

#### **Calculation of EOQ by using Tabular Method**

(1) No. of Order(N) = $A/Q$	1	2	4	6	8
(2) Order Size(Q) = $A/N$	100	50	25	16.67	12.5
(3) Average Inventory = $Q/2$	50	25	12.5	8.34	6.25
(4) Total Carrying Cost = $Q/2 \times C$	10	5	2.5	1.67	1.25
(5) Total Ordering Cost = $A/Q \times O$	10	20	40	60	80
(6) Total Cost = 4 + 5	20	25	42.5	61.67	81.25

## ii) Formula approach

The economic order quantity can, using a short-cut method, be calculated by the

Following equation

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

Where,

A = Annual usages of inventory (units)

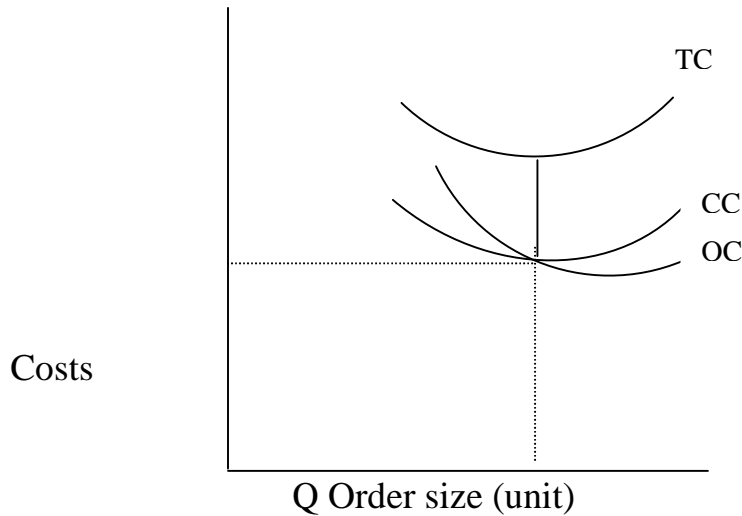
O = Ordering cost per order

C = Carrying cost per unit.

## iii) Graphic Approach

The economic order quantity can also be found out graphically. In the figure, cost- carrying, ordering and total- are plotted on Vertical axis and horizontal axis is used to represent the order size. We note that total carrying cost increases as the order size increases, because, on an average, a large inventory level will be maintained and ordering costs decline with increase in order size because large orders size means less numbers of orders. The behavior of total cost line is noticeable since it is a sum of two types of costs, which behaves differently with order size. The total cost decrease if average ordering cost is more than offset by the increase in carrying cost.

**Figure No: 2.1**  
**Showing Order size & Costs through Graphic Approach**



### 2.2.1.2 Re-Order Point/ Re-Order Level

The EOQ technique determines the size of an order to acquire inventory so as to minimize the carrying costs as well as the ordering cost. In other words the EOQ provides an answer to the question how much inventory should be ordered in one lot? Another important question is when should the order to procure inventory be placed? This aspect of inventory management is covered under the re-order point problem. The re-order point is stated in terms of the level of inventory at which an order should be placed for replenishing the current stock of inventory. In the other words, re-order point may be procuring additional inventory equal to the economic order quantity. We use a formula to calculate the re-order point. It is based on the following assumptions:

Constant daily usages of inventory and Fixed lead-time.

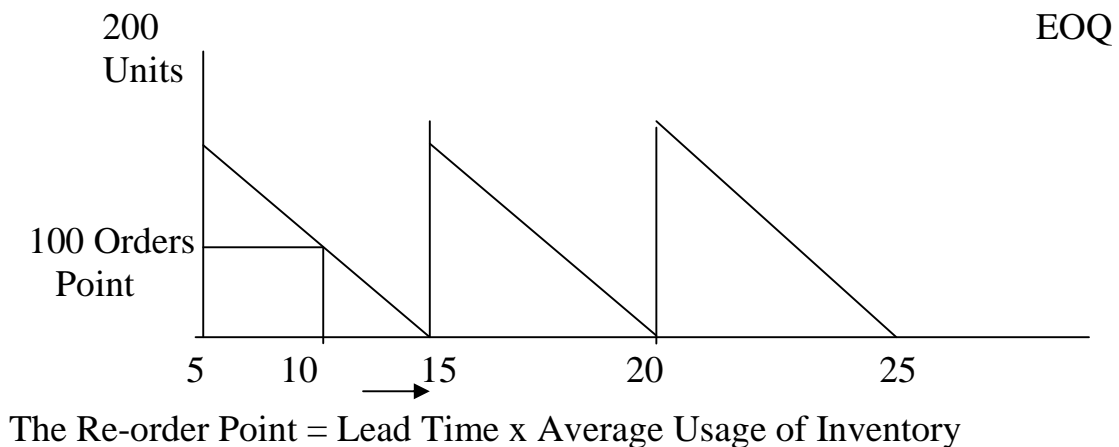
In other words the formula assumes conditions of certainty under which the re-order point = Lead time in days X Averages Daily usages of inventory

The term lead-time refers to the time normally taken in receiving the delivery after placing orders with the suppliers. It covers the time span from the point when the decision to place the orders for the procurement of inventory is made to the actual receipt of the inventory by the firm.

The average usage means the quantity of inventory-consumed daily. Thus we can define re-order point as the inventory level, which should be equal to the consumption during the lead-time.

Suppose demand for inventory is known with certainty but that it takes 5 days before an order is received. The EOQ of the firm is 200 units resulting in orders being placed every 10 days. If the usages were steady, the firm now would need to order 5 days before it runs out of stock or at 100 units of stock on hand. Thus, the re-order point is 100 units. When the new order is received 5 days later, the firm will just have exhausted its existing stock.

**Figure No. 2.2**  
**Showing Re-Order Point when lead-time is certain**



### **2.2.1.3 Goods in Transit**

If a new order must be placed before the previous order is received, a good in transit inventory will build up. Goods in transit are goods that have been ordered but have not been received (*Weston, Bisley & Brigham; 1996:434*).

A good in transit inventory will exist if the normal delivery leads the time between orders. Re-order point is calculated as follows:

Re-Order Point = Lead Time x Average Usages – Goods in Transit

### **2.2.1.4 Maximum Stock Level**

Maximum level represents the maximum quantity of an item of inventory that can be held in stock at any time that stock shouldn't exceed this quantity. The quantity is fixed so that there may be no over stocking. The maximum stock level is fixed by taking into account the following factors: -

- a. Amount of capital available for maintaining stock
- b. Go down space available
- c. Maximum requirement of the stock for production purpose at any point of time.
- d. Rate of consumption of the materials during the lead-time.
- e. The time lag between indenting and receiving of the inventory.
- f. Possibility of loss in stores by deterioration, evaporation etc.
- g. Fluctuation in price: - for instance, if there is possibility of price increase in the coming period a comparatively large maximum stock level will be fixed. On the other hand, if there is the possibility of

decrease in price in the near future, stocks are kept at a much-reduced level.

- h. The seasonal nature of supply: Some items of inventory goods are available only during specific periods of the year, so these have to be stocked heavily during those periods.
- i. Restrictions imposed by Government or local authority in regard to material in which there are inherent risks e.g. fire and explosion.
- j. Possibility of change in fashion and habit, which will necessitate change in requirement of materials.

The formula of maximum stock level: ***Re-Ordering Level + Re-ordering Quantity - (Minimum Consumption x Minimum Re-Ordering Period)***

### **2.2.1.5 Minimum Stock Level**

It represents the minimum quantity of inventory, which must be maintained in hand at any time. The quantity is fixed so that production or sales may not be held up due to shortage of that inventory. In this level, the following factors are taken into consideration:

- a. Lead-time i.e. time lag between indenting and receiving of the inventory. It is the time required for replenishing the supply.
- b. Rate of consumption of the inventory during the lead-time.
- c. Nature of inventory, minimum level isn't required against customer's specific orders.

The formula for the calculation of minimum level: *Minimum Stock Level=Re-ordering Level -(Normal Consumption x Normal Re-Order Period)*

#### **2.2.1.6 Danger Level**

This is a level at which normal issue of the material are stopped and issues are made only under specific instructions. The firms will make special arrangements to get the materials, which reach at their danger levels so that the production may not stop due to shortage of materials.

Danger Level = Average Consumption x Maximum Re-Order Period

#### **2.2.1.7 Perpetual Inventory System**

The Chartered Institute of Management Account, London defines the perpetual inventory as “A system of record maintained by the controlling department, which reflects the physical movement of stock and their current balance”. Thus, this is a method of ascertaining balance after every receipt and issue of materials. It means the system of record. Continuous stock – taking is a physical checking to ensure the accuracy of perpetual inventory system. It is based on record. It requires a lot of recording. Thus, it is expensive also. This system is adopted at shorter interval.

The perpetual inventory system is intended as an aid to inventory control because the balance of stock shown by bin cards or stock ledger should agree with the balance ascertained by physical checking.

The operation of the perpetual inventory system may be outlined as follows:

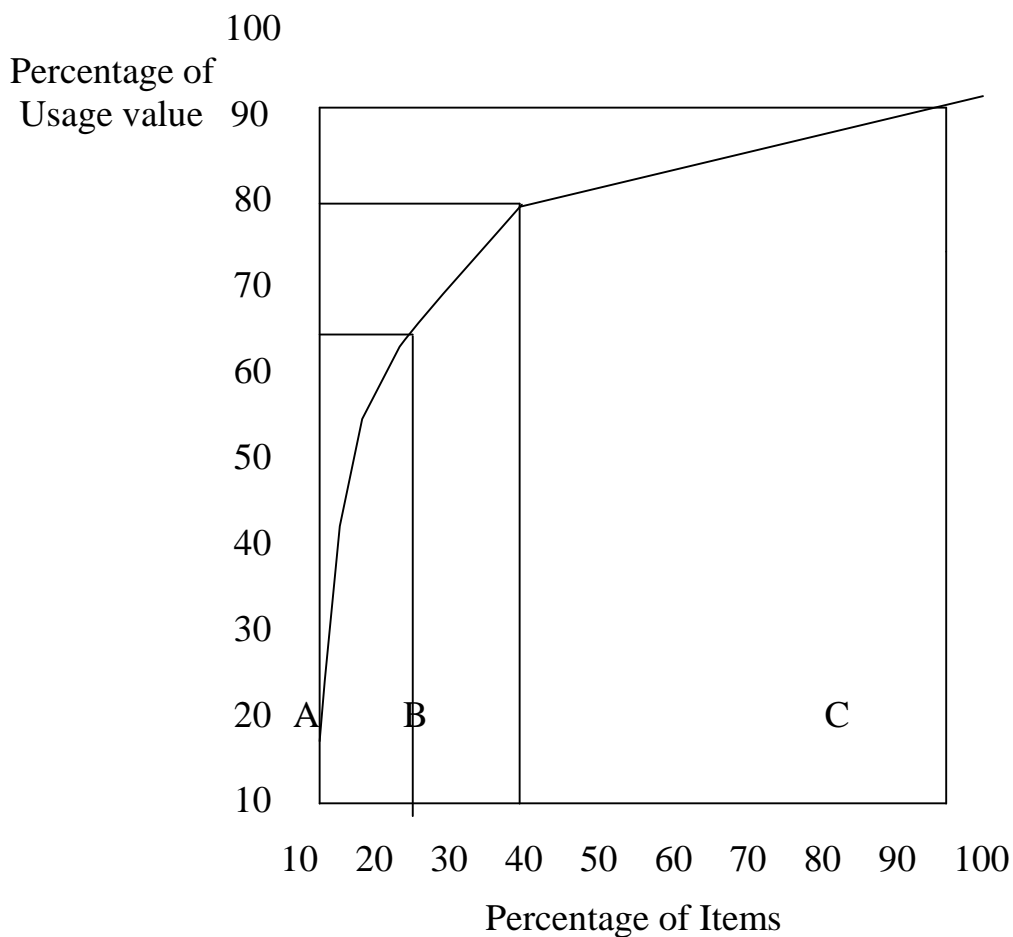
- a. The stock records are maintained and up-to-date posting of transactions is made there in so that current balance may be known at any time.
- b. Different sections of the stores are taken up by rotation for physical checking.
- c. Stores received but awaiting inspection aren't mixed up with regular stores at the time of physical verification because entries relating to such stores have not yet been made in the stock records.
- d. Notice of the particular items to be verified each day.
- e. The physical stock available in the store after counting, weighting, measuring or listing as the case may be is properly recorded by any of the following three methods. They are:
  - (a) Record in Bin Cards
  - (b) Inventory tags
  - (c) Stock Verification sheets.

#### **2.2.1.8 ABC Analysis**

ABC analysis is a widely used classification technique to identify various items of inventory for the purpose of inventory control. This analysis is important that a firm shouldn't exercise the same degree of control on all types of inventory. We have to classify all types of raw materials on the basis of nature and involvement of the investment and importance of it. Manufacturing organization finds it useful to divide materials into three categories for the purpose of exercising selective control on materials. ABC analysis measures the cost of significance of each item of materials that contribute to a larger percentage of items, which represent a smaller

percentage of the value of items consumed. Between these two extremes will fall those items whose percentage is more or less equal to their value of consumption. Thus items falling in the first category are treated as 'A' second category as 'B' and third category as 'C'. Such an analysis of materials is known as ABC analysis.

**Figure No: 2.3**  
**Graphic Presentation of ABC Analysis**



In above figure, A level of material are in low quantity but its value is higher than B level material. C level material store in the highest level of quantity but its value is lowest B level lies in between in terms of both quantity and value. It means store is maintained category wise and store maintain at

different levels. In ABC analysis firstly we have to plan properly all inventories items into 3 categories.

The items in A, B & C classes can be compared in the following tabular form  
(Goel, 1999: 307-308)

**Table No: 2.2**

**Showing the items on the basis of ‘Always Better Control’**

<b>A</b>	<b>B</b>	<b>C</b>
Maintains close control	Maintains moderate control	Maintains less control
Size of order based on calculation required	Size of order based on usage	Size of order based on the level of inventory
Procured from many sources	Procured from two or three sources	Procured from two sources
Keeps records of receipt	Keeps records of receipt and usage	No records are kept
More effort to reduce lead time	Moderate effort	Minimum effort
Close checks on schedule revision	Some check on changes in need	No checks against on need
Frequent ordering	Less frequent ordering	Bulk ordering
Continual expediting	Expediting for prospective shortages	No expediting
Accurate forecasts	Less accurate forecasts	Approximate forecasts
Low safety stock for less than 2 weeks	Large safety stock up to 2 to 3 months	Large safety stock for more than 3 months
High consumption value	Average consumption value	Low consumption value

The following points should be kept be in mind for ABC analysis (Goel, 1999:308):

- Where items can be substituted for each other, they should be preferably treated as one item.
- More emphasis should be given to the value of consumption and not to price per unit of the item.
- The entire item consumed by an organization should be considered together for classifying as A, B, or C instead of taking them as spares raw-materials, semi-finished and finished items and then classifying as A, B, or C.
- There can be more than three classes and period of consumption needn't necessarily be one year.

The following are the step for classes of items as A, B or C.

1. Take a representative sample of stock items.
2. The annual usage value is calculated for each item to be classified by multiplying the quantity used with the unit price of the item.
3. The usage values in the step (2) are arranged in descending order.
4. Calculate the cumulative total of the number of items and the usage value obtained in step (3)
5. Find the percentage of the value obtained in step (4) and the grand total of the corresponding columns.
6. Percentage of items are taken on x axis and the corresponding usage value percentage on y-axis to plot various point on graph paper and to draw a smooth curve.

7. Mark the points x and y where the slope of the curve change sharply. The usage value and the percentage of items corresponding to these points will determine the items to be classified as A, B, or C.

## **2.3 Different Cost Concepts**

The goal of the inventory management is to provide the inventories for sustaining operation at the lowest possible cost. The first step in inventories management is to identify all, the cost involved in purchasing and maintaining inventories. Typical costs associated with the inventories are described below: -

### **2.3.1 Carrying/Holding Cost**

Total carrying cost generally increases in direct proportion to the average amount of inventory carried. Inventory carried in turn depend upon the frequency with which orders are placed (*Weston, Bisley & Brigham, 1996:428*)

The cost associated with having inventories, which includes storage cost & so on are holding cost. These costs generally increases in proportion to the average amount of inventory held.

To illustrate if a firm sales (S) unit per year, if it places equal order 'N' times per year then  $Q = A/N$  unit will be purchased with each order. If the inventory is used evenly over the year & if no safety stocks are carried then the average inventory 'A' will be,

Average inventory (A) = Units per order/2

$$= S/N = Q/2$$

Defining the annual percentage carrying cost as C, annual total cost as (Tcc), the percentage carrying cost 'c' times, price per unit PP times the average inventory in units 'A'

$$\begin{aligned}\text{Total Carrying Cost (Tcc)} &= C \times PP \times A \\ &= C \times PP \times Q/2\end{aligned}$$

The inventory carrying costs are further explained as below: -

### **2.3.1.1 Capital/ Opportunity Cost**

This consists of expenses of raising funds (interest on capital) to finance the acquisition of inventory. If funds weren't locked up in inventory, they would have earned a return. This is opportunity cost fund or financial cost components of the cost (*Weston, Bisley & Brigham; 1996: 428*)

Funds associated with inventories aren't available for other uses. Therefore an opportunity cost is determined by the alternative use to which the funds could be put.

For example: From the alternative uses if firm can earn 10% return then the capital cost of inventory is 10%.

### **2.3.1.2 Handling Cost**

This size of consignments and the material handling facilities in the store determines these cost up to a certain level of inventory size, the per unit handling cost beyond that starts increasing.

### **2.3.1.3 Storage Cost**

The Cost associated with maintenance of inventory is storage cost. These includes expenditure made on inventory staff, expenditure on providing various facilities like heating, lighting, floor space, shelves and racks, bins and containers, material handling equipment's and other provisions for safe and proper storage of items. These costs generally depend upon the volume to value ratio of an item.

### **2.3.1.4 Depreciation cost**

In every organization, the value of capital investment decreases with time. Thus, there is a tendency among organization to reduce its capital investments on machines and other equipment. The depreciation cost is thus reduced. Naturally the desired amount of production with reduced number of machines can be obtained by running the machines in slack period increasing the size of inventory.

### **2.3.1.5 Spoilage and Shortage Cost**

Many products deteriorate overtime in storage. The precise nature of the deterioration varies from product to product but whatever the causes, it represents reduction in company's assets and such is a cost of holding inventories. This is termed as spoilage cost (*Ezra 1995: 34*).

### **2.3.1.6 Insurance and Taxes**

Many of the goods in inventory requires insurance and it should be included in inventory holding costs whether outside insurance is carried or inventory is self insured. The cost of this insurance varies according to the size and value of inventory. The same is true for taxes, some countries levy inventory taxes, for example on various data's through the year. The inventory a firm has on hand, the higher their tax bill will be. Such tax and effect prudent inventory management may dictate period reduction in inventory to coincide with the data's on which the assessment are made (*Megee, 1990: 44*).

### **2.3.1.7 System Cost**

Another type of inventory carrying cost, which is associated with the administration of inventory system, is known as system cost. These costs are incurred for gathering information, supervision, and physical stock checking and maintaining the record keeping equipment cost. It is difficult to determine whether these expenses will be high or low except by making a comparison of amount of actual inventory system (*Handling and Whitin, 2004:17*)).

### **2.3.2 Ordering Cost**

It is assumed that carrying cost are entirely variable & increases in direct proportion to the average size of inventory, ordering cost usually are fixed regardless of average size of inventory. For example, the cost of placing and increasing an order generally refers inter office memos, using tax transmission or long distance telephone calls and taking delivery-essential

are fixed regardless of average size of inventory (*Weston, Bisley & Brigham, 1996:429*).

In practice, the cost per order generally contains both fixed and variable components, since a portion of the cost such as that of receiving and inspecting the order normally varies with the quantity ordered. Ordering cost may differ in the sense of inventories nature. In case of raw material, ordering cost involves the clerical cost in placing an order as well as certain cost of receiving and checking the goods once they arrive. For finished goods, ordering cost involves scheduling a production run and for work-in-progress ordering cost is likely to involve nothing more than record keeping.

Furthermore, ordering cost is the cost involved in placing & receiving an order or purchased items. The expenses involved in this cost are: -

- a) Cost of placing an order
- b) Requisitioning cost
- c) Transportation/ shipping cost
- d) Receiving, inspecting and storage cost
- e) Sales tax, customs etc
- f) Clearing and forwarding cost
- g) Insurance of raw material
- h) Stationary cost
- i) Bank commission/LC charges etc.
- j) Telephone/Fax/Postage expenses to follow up
- k) Cost incurred when raw materials are in transit

Ordering cost increases with the number of orders, thus the more frequency in Inventory occurred, higher the firms ordering cost. On the other hand, if the firm maintains large inventories level, there will be a few orders placed

and ordering cost will be relatively small. Thus ordering costs decreases with the increasing size of inventory. If the fixed costs associated with ordering inventories is 'O' and we placed 'N' ordering per year, the total ordering cost is given as: -

$$\begin{aligned}\text{Total Ordering Cost (TOC)} &= O \times N \\ &= O (S/Q)\end{aligned}$$

Where,

TOC = Total Ordering Cost

O = Fixed cost per order

Q = Inventory quantity for each order

### **2.3.3 Stock out Costs**

It is associated with demand. The depletion in stock results in loss of sales or back order costs. When the sales lost due to stock out, the firm losses the profit margin on unmade sales and the firm's goodwill. If the customer uses another business elsewhere, future profit margin may also be lost and back order cost is needed to convince customers to use again after inventories have been replenished. Back order cost includes loss of goodwill, money paid to re-order goods and notification to customers when goods arrive (Everett, Adams & Jebert, and 2000: 462).

## **2.4 Inventory Model**

### **2.4.1 Periodic Re-view System**

The system is sometimes called the constant cycle system. The system has the following characteristics (*Lucey T., 2004: 183*).

Stock levels for all parts reviewed at fixed intervals e.g. every fortnight where necessary a replenishment order is issued. The quantity of the replenishment order is not a previously calculated EOQ, but is based upon the likely demands until the next re-view, the present stock level and lead-time.

The replenishment order quantity seeks to bring stocks up to a pre-determined level. The effect of the system is to order variable quantities at fixed intervals as compared with the re-order level system.

### **2.4.2 Replenishment Model**

Replenishment models or base stock models are effective in many real inventory situations, particularly when delivery lead times are longer and shortage cost are extremely higher or when stock counts are infrequent (*Joseph and Ernest, 1970: 362-363*).

This model is also called maximum liability model. Inventory costs are not considered explicitly in the replenishment system and there is no fixed re-order quantity instead, inventory is reviewed at periodic intervals, and if there have been any sales since the last re-view, an order is placed. In this model, there is only one number to be determined: M, The base stock or maximum inventory level, SW is mean weekly demand, L is the mean lead time in weeks, R is the Inventory review time in weeks, and B is the buffer

stock in units.  $M$  must certainly be larger than  $LSW$ , which is just sufficient to meet average demands until the ordered goods arrived. We therefore see that the replenishment level is determined by the following formula:

$$M = SW (L + R) + B$$

Depending on whether lead time is greater than or less than the review time, one of the following two rules is used for determining the re-order quantity ( $q$ ) under the replenishment Model: -

$$Q = M - I \text{ if } L < R$$

$$Q = M - I - T \text{ if } L > R$$

Where,

$I$  = Inventory at a review time (in units)

$T$  = Number of unit in transit (previous orders which haven't yet arrived)

The buffer stock  $B$  must be sufficient to guarantee an adequate service level in the face of variations in both demands and lead-times. We take the replenishment times as being the total of lead-time and review time and have a measure of the distribution in demand over.

When lead times are longer compared to review times, larger buffer stocks are required.. For long times (and particularly for items which have a large shortage costs), one finds replenishment models in which orders are placed when an items (or a number of items) is sold.

### **2.4.3. Inventory Models with Uncertainty**

In simple inventory models, we assume that demand and supply as well as lead times are constant. In many real world applications, demand cannot be predicted with certainty and lead times often vary from one order to another. A consequence of this variation is that stock outs may occur if future demand exceeds our estimate if an order arrives later than expected. It is possible to reduce the risk of stock-outs by carrying larger inventories called safety stock or buffer stocks; however additional costs are incurred by tying up additional funds in inventories and risking the possibility of obsolescence. The objective then, is to develop a model for determining inventory policy that balances these risks and minimizes expected total incremental costs.

### **2.5 Review of Previous Studies**

Inventory Management is a wide subject but no-one pay attention in this field. Many modern techniques to control inventory management have been realized. In Nepal, many public & private enterprises have been established as well as analysis has been made but only on the aspect of financial performance. A few researchers made the research in inventory management of manufacturing companies. An attempt is made to review some of the researches, which have been submitted in inventory management in the context of Nepal.

**Ms. Pathak** (2007) carried out a research study on **Inventory Management of Hetauda Cement Industries Limited** to examine the profitability and efficiency of HCIL regarding inventory management. To find out the

efficiency level, she has investigated various inventory related factors such as raw-materials consumption and collection procedure, store and warehousing techniques, production and supply techniques and its schedules etc.

Ms. Pathak has used both secondary and primary data for analysis of the inventory management system of HCIL. She has applied all accounting, financial and statistical tools to evaluate and analyze the gathered data. Some of her remarkable findings were:

- ) HCIL is not running even in its average capacity due to lack of raw materials.
- ) The company could not keep proper balance between yearly demand and supply trend so the inventory stock is fluctuating every year.
- ) The company could not apply even basic inventory management system, so it needs to apply the inventory control system to strengthen the organization.

**Mr. Dahal** (2006) has carried out a research study on **A Comparative Study on Inventory Management of Dabur Nepal Pvt. Ltd. and Nepal Lever Ltd.** His aim of study was to examine and find out the present position of inventory management of both the companies.

Mr. Dahal has used both primary and secondary sources of data along with previous studies, articles and published/unpublished official records of both organization for the sake of examination and analysis. He used various accounting, financial and statistical tools to analyze the data. His findings were:

- ) Both the organizations use raw materials from local, India and third countries where they are unable to practice inventory management.
- ) Purchasing of raw materials in NLL is fluctuated whereas DNPL has increasing trend of raw materials procurements because of sound management of demand and supply.
- ) They both have invested huge amount in inventories but do not apply dynamic inventory management system.
- ) The researcher has suggested that the both companies should apply the control of stock level to get better performance.

**Mr. Upadhy** (2005) has conducted **A Study on Inventory Management in Janakpur Cigarette Factory Limited**. The study was to analyze the performance of JCF on the basis of demand and supply trend regarding inventory management. He has tried to identify the present practice of procurement of raw materials, maintenance of work in process stock and finished stock etc.

The researcher has collected related data from the factory using published and unpublished official records. He also used journals, magazines, government and universities publications as a source of secondary data. Mr. Upadhy used both qualitative and quantitative tools of various aspects to present and analyze the data. Some of his important findings were:

The factory was highly dependent upon raw material suppliers, it means that the company was unable to find competitive source of raw materials.

) The company is always facing stock out, overstock and under stock problems, it is all due to lack of appropriate application of inventory management.

) The factory is running under traditional productions system, which has arisen problems in implementation of scientific inventory system.

) The top-level management should pay attention in budgetary and financial analysis along with purchasing, production and financial aspects of inventory management to boost up the organization.

**Mr. Niraula** (2004) has conducted **A Study of Inventory Management in Dairy Development Corporation, with special reference to Biratnagar Milk Supply Scheme** to determine the organizational efficiency in terms of Inventory Management. His main objective of the study was to identify the organizational efficiency in terms of Inventory Management and to identify the inventory quality maintenance process of BMSS.

Mr. Niraula has collected both primary and secondary data for the sake of examination and interpretation. Primary data has been obtained through inquiries, informal talks and interviews with officers whereas secondary data were collected from periodic bulletins, journal reports, and published/unpublished records. He used various analytical tools to make the research findings. Some of his remarkable findings are:

) BMSS was unable to practice optimum order quantity in material procurements.

- ) The project is running without practice of any scientific inventory management system, which brought loss in profitability of the company.
- ) Top-level management should pay due attention to improve efficient application of inventory management to reduce procurement costs, carrying costs and production costs.

## **2.6 Research Gap**

These days, the new inventory management tools and techniques have been increased dramatically. Progress in computer application and advanced computer software available in the market has made it possible to control the inventories. Besides it, there are many inventory control tools and techniques that have been developed to optimize the inventories reduce inventory costs.

Many studies have reported that implementation of scientific inventory management is essential in Nepalese business organizations. However, there has been very little research reported on the effectiveness of scientific inventory management and its impact on profitability. The purpose of the present study is therefore to ascertain the effective use of scientific inventory management tools to reduce costs and increase profitability of Organization.

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

The above-mentioned objectives can be fulfilled by well-settled research methodology. The proper analysis of this study can be meaningful only if the right choice of research tools is made. Such selected tools should help to get meaningful conclusion. “Research methodology refers to the various sequential steps to be adopted by a researcher in studying problem with certain object in view. It would be appropriate to mention that research project are not suspect-able to any one complete and inflexible sequence of steps and the types of problem to be studied will determine the particular steps to be taken and their order too”. (C.R. Kothari, 1994: 19)

Thus, Research methodology is a technique of analyzing the obtained data to solve the research problem. It consists of descriptive approach and statistical tools. Descriptive approach is used to analyze the research problem, setting hypothesis and other theoretical problem and aspects. Statistical tools are used to analyze the numerical data.

In this chapter the focus has been made on research design, nature and sources of data, sampling procedure, coverage of data, tools used for analysis and definition of some key terms used.

#### **3.1 Introduction**

Research methodology is the first steps to be taken for the study of the problem by a researcher. This is full path of the study, which leads to the

findings and fulfills the objective of the research study. Followings are steps of research methodology used in this study.

- ) Research design
- ) Nature and Sources of Data
- ) Population and Sample
- ) Data collection Procedures
- ) Analytical Tools
- ) Methods of Analysis and Presentation

### **3.2 Research Design**

“Research design is the plan, structure and strategy of investigation conceived so as to obtain answer to research questions and to control variance” (F. N. Kerlinger, 1978: 300)

Thus, Research methodology refers to the various sequential steps to be adopted by the researcher in studying problem with certain object in view.

To conduct this study, descriptive and analytical research design has been adopted. The study is based on historical data and an “ex post facto” research because no variables are in the control of researcher and no variables in this research is manipulated during the study period. Descriptive research design is used for conceptualization, problem identification, conclusion and suggestion. Analytical research design is used for analyzing the data to find out the result. The study is based on primary and secondary

data. Objective of the primary data analysis in this study is to survey the opinion of the concerned people about the topic i.e. inventory management. Similarly, secondary data are analyzed to determine the relationship between the production system and inventory management of FUDCO.

The study is mainly concentrated on case study of inventory management and its impact of profitability on FUDCO and data are mostly secondary. Therefore as per the nature of the study, analytical and descriptive research design has been followed.

### **3.3 Nature and Sources of Data**

The study is basically conducted on secondary data but primary sources have been also used as per the requirements of the study. Depending on the nature of data and information, following sources have been used for research purpose:

#### **i) Primary Sources:**

- Direct interview and Supplementary questionnaires have been conducted.

#### **ii) Secondary Sources:**

- Official records and publications of FUDCO.
- Published and Unpublished records
- Government and non-government publications
- Previous Studies etc.

### **3.4 Population and Samples**

The research has been conducted to identify the applied techniques used to acquire and to manage the inventories, to examine the profitability & efficiency, and to analyze the different aspects of inventory management in Food Production Complex of Chaudhary Group (FUCDO). As it is a case study, the populations as well as samples are associated with FUDCO.

### **3.5 Data Collection Procedure**

Secondary data are collected from published/unpublished information and records of FUDCO whereas primary data are collected through questionnaire, informal interview and discussion with the responsible head as well as managerial person of the company.

### **3.6 Analytical Tools Applied**

Secondary data collected in raw form are classified and tabulated in the required form. The following accounting/financial tools and statistical tools have been used for analysis and interpretation of data.

#### **3.6.1 Accounting/Financial tools**

There are different types of financial tools that are applied in order to evaluate and examine inventory management in the research process are given below.

##### **a. ABC Analysis**

This technique is used to identify various items of inventory for the purpose of inventory control. In this analysis, we divide the inventory items into

three groups A, B and C. According to investment and value, inventories are classified A, B and C groups.

### **b. EOQ Model**

This model is used to find the economic quantity that we order to purchase inventory at a time. It can be computed by using following formula:

$$EOQ \times \sqrt{\frac{2AO}{C}}$$

Where A = Annual Consumption/Demand

O = Ordering cost per order

C = Carrying cost per units

### **c. No. of Order**

This formula is used to find out how many times we order with EOQ annually. This can be computed as under:

$$\text{No. of order size} = \frac{\text{Annual Consumption/demand}}{\text{EOQ}}$$

### **d. Order Size**

It is calculated by using following formulae:

$$\text{Order size} = \frac{\text{Annual Demand}}{\text{No. of Order}}$$

### **e. Average Inventory**

It is calculated by using following formulae:

$$\text{Average Inventory} = \frac{(\text{Opening Inventory} \Gamma \text{ Closing Inventory})}{2} \text{ OR } \frac{\text{Order Size}}{2}$$

#### **f. Total Cost**

It refers to total inventory cost. It can be computed as under:

Total Cost = Total carrying cost + Total ordering cost

Where,

Total Carrying Cost = Average Inventory x Carrying Cost per Unit

Total Ordering Cost = Ordering Cost per Order x No. of Order

#### **g. Re-Order Point**

It is that point at which the firm places an order with suppliers for procuring an additional inventory equal to EOQ. This model is calculated to find out at which point firm re-orders. It can be computed by using following formulae:

ROP = Usage rate x Lead time [When safety stock is not mentioned]

ROP = (Usage rate x Lead time) + Safety stock [When safety stock is mentioned]

#### **h. Ratio Analysis**

##### **i. Inventory Turnover Ratio**

It measures the efficiency on inventory management and how quickly inventory is sold. It indicates the relationship between costs of goods sold & inventory level. The formula is: -

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \text{ OR } \frac{\text{Sales}}{\text{Closing Stock}}$$

##### **ii. Inventory Holding Days (DIH)**

It measures how many days the firm holds the inventory. The formula is: -

$$\text{Inventory holding days} = \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} \times \text{Days}$$

### **iii. Raw Material Turnover Ratio**

This ratio examines how well the firm converts raw materials into WIP and WIP into finished goods. The formula is: -

$$\text{Raw Materials Turnover Ratio} = \frac{\text{Material Consumed}}{\text{Average Raw Material Inventory}}$$

### **iv. Inventory to Total Assets Ratio**

It measures the relationship between inventory and total assets. This ratio can be computed for what percentage of inventory holds as an asset. The formula is: -

$$\text{Inventory to Total Assets Ratio} = \frac{\text{Inventory}}{\text{Total Assets}} \times 100$$

### **v. Inventory to Net Working Capital Ratio**

It measures the relationship of closing stock of finished goods and working capital. This ratio explains that percentage of working capital is represented through closing stock of finished goods and if this closing stock is excessive the liquidity resources of the business enterprises get reduced. The formula is: -

$$\text{Inventory to Net Working Capital Ratio} = \frac{\text{Closing Stock}}{\text{Net working capital}}$$

### **vi. Inventory to Current Assets Ratio**

It measures how much inventory firms should keep as current assets. It shows the relationship between inventories to current assets. The formula is:

$$\text{Inventory to Current Assets Ratio} = \frac{\text{Inventories}}{\text{Current Assets}}$$

### **vii. Inventory to Profit Ratio**

This ratio tells how much inventory is needed to generate a unit of profit.

The formula is:

$$\text{Inventory to Profit Ratio} = \frac{\text{Material Consumed}}{\text{Gross Profit}}$$

### **3.6.2 Statistical Tools**

Many kinds of statistical tools can be applied to examine the relationship between financial data of a company. In this study the following statistical tools have been taken into consideration.

#### **a. Mean**

It is calculated by dividing the no. of variables to no. of items, symbolically,

$$\bar{X} = \frac{\sum x}{N}$$

Where  $\bar{X}$  denotes mean/average.

$\sum x$  denotes the sum of all variables and  $N$  denotes no. of items observed.

#### **b. Standard Deviation (SD)**

It is a measure of the deviation of each individual firm. It expresses mathematically how far the individual values deviate or differ from the mean. It is calculated using the following formula:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

Where SD, n and d denote standard deviation, no. of observations and deviation from assumed mean respectively.

**c. Coefficient of Variance (CV)**

It measures corresponding relative of variation. CV is computed as under:

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

**d. Coefficient of Determination**

It measures the degree of correlation between two variables, one dependent and another independent variable. Symbolically,

$$R^2 = \frac{a \sum y \Gamma b \sum XY Z \frac{\phi(y)^2}{N}}{\sum y^2 Z \frac{\phi(y)^2}{N}}$$

Where,

$$a = \frac{\sum y \Gamma \sum b \sum XY Z \frac{\phi(y)^2}{N}}{\sum y^2 Z \frac{\phi(y)^2}{N}}$$

$$b = \frac{\sum xy}{\sum x^2}$$

**e. Regression Analysis**

Using the relationship between a known variable and unknown variable to estimate the unknown one is called as regression analysis. It is an extremely useful tool especially in problems of business and industry involving predictions. It is used to determine the statistical relationship between one (or more) variable on the basis of others.

a)  $Y_1 = a + b X_1$

Where  $Y_1$  = Production,  $X_1$  = Selling price per unit,  $a$  &  $b$  = regression coefficients

b)  $Y_2 = a + b X_2$

Where  $Y_2$  = Closing stock of finished goods,  $X_2$  = Sales,  $a$  &  $b$  = regression coefficients.

c)  $Y_3 = a + b X_3$

Where,  $Y_3$  = purchase of Raw-materials,  $X_3$  = Sales,  $a$  &  $b$  = regression coefficients.

d)  $Y_4 = a + b X_4$

Where  $Y_4$  = Operating profit,  $X_4$  = Closing stock of Raw-materials,  $a$  &  $b$  = regression coefficients.

### **f. Correlation Analysis**

The term Correlation indicates the relationship between two such variables in which with changes in the values of one variable, the values of the other variable also change.

If two or more quantities vary in same path so that movements in the one tends to be accompanied by corresponding movements in the other(s), then they are said to be correlated.

Karl Pearson, the greatest biologist and statistician, has given a formula for the calculation of coefficient of correlation. This method of measuring correlation is called “Pearsonian Coefficient of correlation.” This is the mathematical method of measuring the degree of association between the two variables say  $x$  and  $y$ .

The formula of Karl Pearson’s coefficient of correlation is: -

$$r = \frac{\sum xy}{n \sqrt{\frac{\sum x^2}{n} \frac{\sum y^2}{n}}}$$

Probable error of coefficient of correlation

$$P.E. = 0.6745 \frac{1 - r^2}{\sqrt{n}}$$

The value of r in the universe would be:

$$r \pm P.E.$$

CHAPTER – IV  
DATA PRESENTATION AND ANALYSIS

Introduction

**Inventory management is a part of overall management process of an organization. It is the formal management process of an organization in terms of minimizing investment on inventories and maximizing the organization's overall earnings. Profit is major element of each and every business endeavor for its long term existence. Survival and further development to fulfill social and organizational expectations to achieve the profit, is one of the major tasks of an organization to control over its investment on inventories.**

**The basic objective of this chapter is to present and analyze the collected information for reasonable recommendations. In this section; gathered data has been examined and analyzed using various financing and statistical tools in order to find out the organizational effectiveness in terms of inventory management.**

**In this section, first part is analysis of inventory management and second part is analysis of its effect on the present positions of inventory management by using different statistical and financial tools.**

4.1 Analysis of Inventory Management of FUDCO

**Inventory management is the planning, directing, controlling and co-ordination of those activities which are concerned with inventory requirement. The major functions of inventory management are planning and programming for material purchase, Store and stock control, receiving and issue of material, transportation and material handling of the materials and value analysis etc.**

**Especially the procedure of inventory management covers the activities such a purchasing, receiving, store keeping, issuing and pricing.**

4.2 Trend Analysis

4.2.1 Trend of Purchase of Materials Including Packing Materials (in terms of Rs. Lakh)

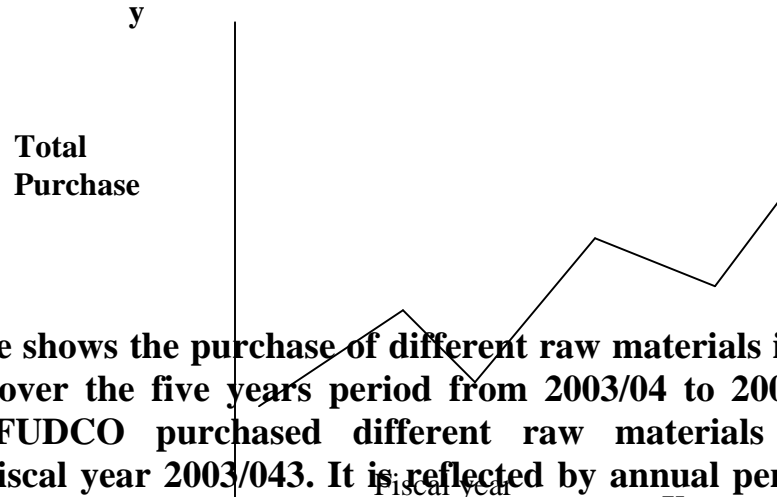
Table No. 4.1  
Trend of Purchase of Materials Including Packing Materials

<b>Fiscal Year</b>	<b>Total Purchase</b>	<b>% Change</b>	<b>Average</b>	<b>7,267</b>
<b>2003/04</b>	<b>5549.43</b>	<b>-</b>	<b>S.D.</b>	<b>1576.31</b>
<b>2004/05</b>	<b>6401.80</b>	<b>15.36</b>	<b>C.V.</b>	<b>21.69%</b>

2005/06	7381.80	33.02	
2006/07	7238.82	30.44	
2007/08	9762.28	75.91	

Figure 4.1

Trend of Purchase of Materials Including Packing Materials



The above table shows the purchase of different raw materials in terms of their value over the five years period from 2003/04 to 2007/08. It reveals that FUDCO purchased different raw materials costing Rs.5549.43 in fiscal year 2003/04. It is reflected by annual percentage change taking f/y 2003/04 as a base. It is Rs. 6401.80 in f/y 2004/05 which is increased by 15.36% than the base year 2003/04. However it also increased by 33.02%, 30.44% and 75.91% in the f/y 2005/06, 2006/07 and 2007/08 respectively. The S.D and C.V. of purchase trend are 1576.31% and 21.69% respectively.

From the above analysis it is observed that the material consumption in the factory is erratic as the raw material has a direct relation with production as well as sales which were fluctuating over the study period. This indicates that there is no sound purchasing policy in the organization. The procurement of raw materials is increasing except in fiscal year 2004/05, but it is not as much satisfactory. The increasing rate is also in fluctuating trend in some year like 30.44% in f/y 2006/07 and then 75.91% in f/y 2007/08. This situation may be due to lack of proper planning for purchasing of materials. On an enquiry whether the company is using the modern procurement technique like properly maintained stock level, fixing level as well as economic order quantity the authority didn't provide satisfactory answer. From this it is clear that the company has neither maintained the maximum and minimum stock level nor fixed the EOQ level.

To solve this problem to some extent there should maintain maximum stock level, minimum stock level; reorder level as well as economic lot

**size. This helps the management to strike balance between liquidity and profitability.**

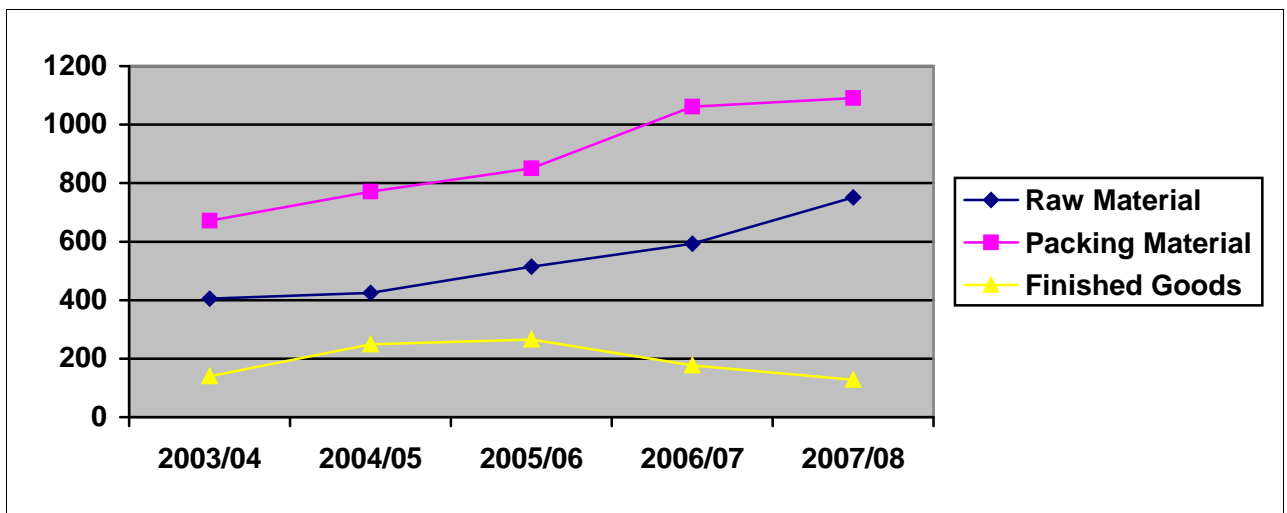
4.2.2 Trend of Inventory (Raw Material, Packing Materials and Finished Goods) in Terms of Amount (in terms of Rs. Lakh)

Table No. 4.2  
Trend of Inventory

Fiscal year	Raw Materials	Packing Materials	Finished Materials	Total Amount	Change %	Average	1618.52
2003/04	405.00	671.39	139.60	1215.99	-	S.D.	300.58
2004/05	424.76	771.14	249.06	1444.96	18.83	C.V.	18.57
2005/06	514.44	850.08	265.19	1629.71	34.02		
2006/07	593.31	1061.22	177.26	1831.79	50.64		
2007/08	751.50	1091.05	127.60	1970.15	62.02		

Figure No. 4.2

Trend of Inventory



The above table presents increasing inventory position of FUDCO from fiscal years 2003/04 to 2007/08. The inventory consists of stock of raw materials, packing materials and finished goods which are given in terms of amount. In fiscal year 2003/04 the factory held inventory stock costing Rs. 1215.99. The inventory stock for the fiscal year 2004/05, 2005/06, 2006/07

and 2007/08 was increased by 18.83%, 34.02%, 50.64% and 62.02% i.e. amount Rs. 1444.96, 1629.71, 1831.79 and Rs. 1970.15 respectively than the base year. This S.D. and C.V. are 300.58% and 18.57% respectively.

**From the above analysis it is known that investment in inventory stock of FUDCO is in large amount. And it is also known that the value of inventory stock in every year is increasing. A huge investment on the inventory stock in fiscal year 2007/08 may be due to the outline of inefficient management of inventory. So, it can be concluded that the production and sales plan of the firm is not practicable and realistic. There is no proper co-ordination between the production, sales and procurement planning.**

#### 4.2.3 Trend of Production Cost

The production of last five fiscal years is presented below.

**Production Cost = Total cost of Materials + Manufacturing expenses + Closing Stock of Finished goods – Opening Stock of Finished Goods.**

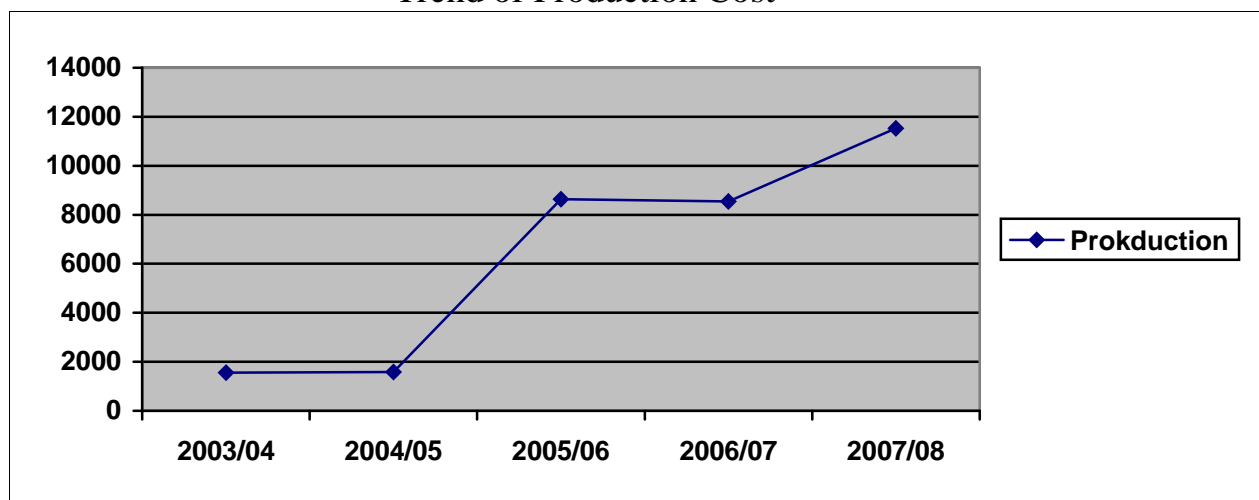
Table No. 4.3

Trend of Production Cost (Rs. in Lakh)

Fiscal Year	Production Cost	% Change	Average	6369.63
2003/04	Rs. 1556.69	-	S.D.	71.30
2004/05	1586.82	1.94	C.V.	4541.51
2005/06	8630.758	454.43		
2006/07	8545.24	448.94		
2007/08	11528.66	640.59		

Figure No. 4.3

Trend of Production Cost



The table shows the trend of production cost of FUDCO. Production cost include materials cost, manufacturing expenses, closing stock of finished goods and subtracting of opening stock of finished goods. In the f/y 2003/04 the production cost is Rs. 1556.69 and it is increased by 1.94%, 454.43%, 448.94% and 640.59% amounted to Rs. 1586.82 to 11528.66 from fiscal year 2004/05 to 2007/08 respectively. The S.D. and C.V. of 71.30% and 4541.51% show the company's satisfactory position.

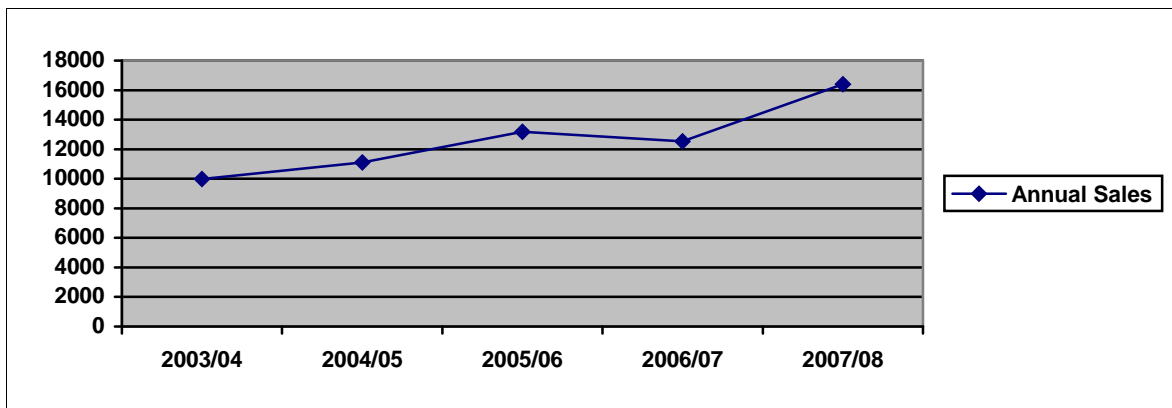
From the above analysis it is clear that the trends of production costs are in increasing trend. From the analysis, it can be concluded that there is a high deviation in the amount of annual needs, collection and consumption. The annual production capacity is very far from the existing production volume.

#### 4.2.4 Trend of Sales in Terms of Value

Table No. 4.4  
Trend of Annual Sales (Rs. in Lakh)

Fiscal Year	Annual Sales	% Change	Average	12643
2003/04	9992.12	-	S.D.	19.29
2004/05	11111.48	11.20	C.V.	2438.90
2005/06	13177.44	31.88		
2006/07	12531.17	25.41		
2007/08	16400.96	64.14		

Figure No. 4.4  
Trend of Annual Sales



The above table shows the sales amount from fly 2003/04 to 2007/08. The sales was Rs. 9992.12 Lakh in f/y 2003/04 and it is increased by 11.20%, 31.88%, 25.41% and 64.14% amounted to Rs. 11111.48 Lakh, 13177.44, 12531.17 and 16400.96 Lakh from f/y 2004/05 to 2007/08 respectively. The S.D and C.V. of sales trend is 19.29% and 2438.90 respectively.

From the above table it can be seen that sales were not synchronized properly as a result although there was an increase in total sales amount but no increase in gross margin. It is due to inefficient production

system. So, FUDCO should control production system and also maintain regular sales system so that FUDCO will get gross profit rather than a loss.

#### 4.2.5 Trend of Net Profit in Terms of Value

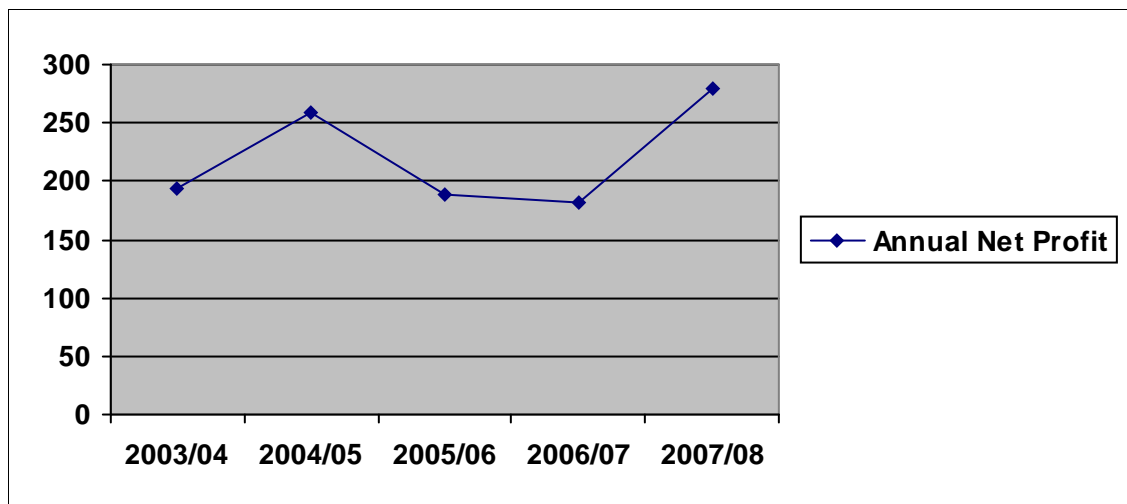
Table 4.5

Trend of Annual Net Profit (in Rs. Lakh)

Fiscal Year	Total Purchase	% Change	Average	220.23
2003/04	193.25	-	S.D.	44.97
2004/05	258.25	33.64	C.V.	20.42
2005/06	188.10	-2.66		
2006/07	182.48	-5.57		
2007/08	279.05	44.40		

Figure No. 4.5

Trend of Annual Net Profit



The table shows that the trends of Net Profit are fluctuating. In f/y 2003/04 the Net Profit was Rs. 193.25 Lakh and then it is decreased frequently in upcoming two fiscal years by -2.66% and -5.57% compared with the base fiscal year 2003/04. The highest amount of net profit is Rs. 279.05 Lakh in the f/y 2007/08 which has 44.40% positive growth from the base year. The C.V. and S.D. of 20.42% and 44.97% of Net Profit seem not very good.

From the above analysis it is found that by fighting various kinds of factors, having good production system as well as by maintaining regular sales system the company earns net profit but instability in net profit is the main problem. There is a huge gap of net profit between different years. The company's own system of showing net profit is also main cause to represent the huge fluctuating trends.

#### 4.3 Correlation

Correlation is a statistical tool, finding out the degree of association between two or more variables with the help of which we can determine whether or not two or more variables are correlated and if they are correlated the degree and direction of correlation is determined. Correlation is said to be positive or negative according to the movements in the same or in the opposite directions.

According to L. R. Corner," If two or more quantities vary in same path so that the movements in the other then they are said to be correlated."

The numerical measurement of relationship between the variable is denoted by the symbol 'r' whose value ranges from -1 to +1 i.e.  $-1 < r \leq +1$

If  $r = 0$ , there is no relationship between the variables

If  $r < 0$ , there is negative relationship between the variables.

If  $r > 0$ , there is positive relationship.

If  $r = +1$ , then the relationship is perfectly positive.

If  $r = -1$ , then the relationship is perfectly negative.

##### 4.3.1 Correlation between the Purchase and Inventory

Here the correlation is used to analyze the relationship between purchase and inventory through the Karl Pearson's co-efficient denoted by 'r'. For this purpose actual purchase is denoted by x and assumed to be independent variable and inventory is denoted by y and assumed to be dependent variable.

Calculation of correlation co-efficient between purchase and inventory is shown in appendix 1. The value of r is 0.8634. The figure of the value of 'r' shows that there is a positive correlation between purchase and inventory. Similarly, probable error is also calculated in the same appendix to test the significance of r. The value of probable error is  $r=0.0768$ . To check the significance of co-efficient of correlation, co-efficient r appears greater than six times the probable error i.e.  $0.8634 > 6 \times 0.0768$ . This shows that calculated value of correlation co-

efficient is significant. It means the purchase and inventories are varying in same directions.

#### 4.3.2 Correlation between Sales and Inventory

To find out relationship between sales and inventory Karl Pearson's coefficient of correlation denoted by 'r' is used For this purpose sales is denoted x and assumed to be independent variable and inventory is denoted by y and assumed to be dependent variable. The results are:

Calculation of correlation co-efficient between sales and inventory of FUDCO is given in appendix 2. The value of r is 1.40 which means that there is positive relationship between sales and inventory. The probable error comes -0.2896. We know if the correlation value 'r' is greater than six times the probable error then only correlation co-efficient is significant but correlation 'r' is greater than six times the probable error i.e.  $1.40 > 6 \times -0.1896$  from appendix 2. So it concludes that the calculated value of correlation coefficient is significant and sales and inventory are varying in same directions.

#### 4.3.3 Correlation Coefficient between Purchase and Sales

Using Karl Pearson's coefficient of correlation denoted by 'r', we have to find relationship between purchase and sales. For this purpose purchase is assumed as an independent variable denoted by 'x' and sales is assumed as dependent variable denoted by 'y'. The consequences are: From appendix 3, the value of coefficient of correlation 'r' of FUDCO is 0.9963 which indicates that there is positive relationship between sales and purchase. That means both are varying in little bit same direction. Similarly, probable error is 0.0022. To check the significance of correlation 'r', the value of correlation 'r' must be greater than six times the value of probable error. The result comes out that the value of 'r' is greater than six times the probable error i.e.  $0.9963 > 6 \times 0.0022$ . The conclusion is that value of correlation is significant and purchase and sales are varying in same directions.

#### 4.3.4 Correlation Coefficient between Net Profit and Inventory

To find out the relationship between net profit and inventory we use Karl Pearson's coefficient of correlation denoted by 'r'. For that purpose we assumed inventory as an independent variable denoted by x and net profit as a dependent variable denoted by y. The result between two variables comes as follows:

From the appendix 4, the value of correlation coefficient 'r' of FUDCO is 0.3054. It means there is almost positive relationship between net profit and inventory. Similarly probable error is also calculated in same appendix. The value of correlation 'r' is not greater than six times the value of probable error i.e.  $0.3054 < 6 \times 0.2735$ . So, the value of correlation is significant. In this case we can conclude that net profit and inventory are varying with low degree in the same direction.

#### 4.4 Regression Analysis

Regression analysis is the average relationship between two variables and this relation is used to estimate or predict the likely value of one variable from specific value of other variables. In other words regression is that statistical tool with the help of which the unknown value of one variable can be estimated or predicted on the basis of known value of other variables.

According to M.M. Blair "Regression is the measure of the average relationship between two or more variables in terms of the original unit of the data."

In regression analysis there are two types of variable one independent and another is dependent variable.

The simple regression equation line of y on x is  $y = a + bx$

Where, y= dependent variable

x= independent variable

a= numerical constant measures which is intercept of line y

b= regression coefficient of y on x. These measures the average changes in the value of y compounding to a unit it change in the value of x.

##### 4.4.1 Simple Regression Analysis of Inventory on Purchase

Regression equation  $y = a + bx$

Table 4.6

Simple Regression Analysis of Inventory on Purchase

Manufacturing Company	Constant Value(a)	Regression coefficient(b)	Standard error(S.E.)	Co-efficient of determination( $R^2$ )
FUDCO	422.40	0.1646	0.1136	0.7807

The above table describes the simple regression analysis of inventory on purchases. In the result FUDCO has lower positive regression coefficient (b) which is 0.1646. It implies that purchase will increase inventory by Rs. 0.1646. On other hand if purchase is zero average inventories seem to be Rs. 422.40. The coefficient of determination ( $R^2$ )

is 0.7807 which indicates that 78.07% variation in inventory is explained by variation in purchase. Standard error is equal to 0.1136%. It means 0.1136% estimation is incorrect and 0.8864% is correct.

4.4.2 Simple Regression Analysis of Inventory on Sales Regression Equation  $y = a + bx$

Table 4.7  
Simple Regression Analysis of Inventory on Sales

Manufacturing Company	Constant Value(a)	Regression coefficient(b)	Standard error(S.E.)	Co-efficient of determination( $R^2$ )
FUDCO	1777.29	0.2687	-0.4293	0.8155

The above table explains the simple regression analysis of inventory on sales. The regression coefficient (b) is 0.2687. It implies that there is a positive impact of sales on inventory as if sales increases the stock will increase and vice-versa. One rupee increase in sales will increase inventory by average of Rs. 0.2687. On other hand if sales is zero, average inventory will be Rs.1777.29 because constant value of (a) is 1777.29. The coefficient of determination  $R^2$  is 0.8155. This indicates that 81.55% variation in inventory is explained by sales. Standard error is -0.4293 which means 100% estimation is correct.

4.4.3 Simple Regression Analysis of Profit on Inventory  
Regression equation  $y = a + bx$

Table 4.8  
Simple regression analysis of profit on inventory

Manufacturing Company	Constant Value(a)	Regression coefficient(b)	Standard error(S.E.)	Co-efficient of determination( $R^2$ )
FUDCO	145.76	0.046	0.4055	0.0936

The above table shows the result of simple regression between profit and inventory. The slope of coefficient (b) of FUDCO is 0.046 which means the marginal propensity to profit is Rs. 0.046. It means that if inventory increased by a rupee on the average the net profit goes up by Rs.0.046. The constant value of (a) is Rs. 145.76 that indicates the average profit will not fall below this amount even if inventory is zero. The co-efficient of determination  $R^2$  is 0.0936. The result indicates that 9.36% variation in profit is explained by variation in inventory.

Standard error is 0.4055 that is 40.55% estimation is incorrect and 59.45% is correct.

#### 4.5 Test of Hypothesis

Regarding to set the test of hypothesis the available sample data is small i.e.  $n < 30$ , so t-test is used. t-test has a number of applications in statistics. Here t-test is used to test the significance of regression coefficient.

In fitting regression of dependent variable  $y$  and independent variable  $x$ , the simple regression equation is obtained as:

$$y = a + bx$$

##### 4.5.1 Test of Hypothesis between Purchase and Inventory

Applying t-test for significance of regression coefficient between purchase and inventory, here it is assumed that purchase is independent variable and inventory is dependent variable.

Hypothesis Setting:

Null hypothesis:  $H_0: b = 0$  i.e. there is no relationship between dependent variable  $y$  and set of independent variable  $x$  or regression is not significant. [Alternative hypothesis  $H_1: b \neq 0$  i.e. dependent variable depends on independent variable or regression is significant.

Table 4.9  
t-test of Purchase and Inventory

Manufacturing Company	Regression coefficient(b)	Standard error(S.E.)	$t_{cal}$	$t_{tab}$ at 5% level of significance at 8 d.f
FUDCO	0.1646	0.1136	1.4464	2.306

The above table explains the test between purchase and inventory. The tabulated value of  $t_{tab}$  at 5% level of significance based on  $(D_1 + n_2 = 5 + 5 - 2)$  of degree of freedom is 2.306.

For FUDCO calculated t value  $t_{cal} = 1.4464$  which is lower than tabulated value.  $t_{tab} = 2.306$ . i.e.  $1.4464 < 2.306$ . Therefore null hypothesis is accepted. It means the slope of regression coefficient is insignificant or the dependent variable inventory is dependent upon purchase.

#### 4.5.2 Test of Hypothesis between Sales and Inventory

Applying t-test for significance of regression coefficient between sales and inventory, it is assumed that sales are independent variable and inventory is dependent variable.

Hypothesis Setting:

Null hypothesis:  $H_0: b = 0$  i.e. regression co-efficient is insignificant or there is no relationship between dependent variable Y and set of independent variable X.

Alternative hypothesis:  $H_1: b \neq 0$  i.e. regression co-efficient is significant or dependent variable depends on independent variable.

Table 4.10

t- test of Sales and Inventory

Manufacturing Company	Regression coefficient(b)	Standard error(S.E.)	$t_{cal}$	$t_{tab}$ at 5% level of significance at 8 d.f
<b>FUDCO</b>	<b>0.2687</b>	<b>-0.4293</b>	<b>-1.42</b>	<b>2.306</b>

The above table explains the result of t-test between sales and inventory. Tabulated value taken at 5% level of significance based on degree of freedom of  $(r_1+r_2-2=8)$  is 2.306. The calculated t value of FUDCO is lower than the tabulated value.i.e.  $-1.42 < 2.306$ . Thus it may be concluded that null hypothesis is accepted. It means the slope of regression co-efficient is insignificant. There is no significant relationship between dependent variable inventory and independent variable sales.

#### 4.5.3 Test of Hypothesis between Inventory and Profit

To check the significance of regression co-efficient between inventory and net profit t-test is used. Here for the purpose, it is assumed that inventory is independent variable denoted as X and profit is dependent variable denoted as Y.

Hypothesis Setting:

Null hypothesis:  $H_0: b = 0$  i.e. the regression Co-efficient is insignificant or there is no relationship between dependent variable Y and set of dependent variable X.

Alternative hypothesis:  $H_1: b \neq 0$  i.e. the regression co-efficient is significant or the relationship between dependent and independent variable is significant.

**Table 4.11**

t-test of Inventory and Profit

Manufacturing Company	Regression coefficient(b)	Standard error(S.E.)	$t_{cal}$	$t_{tab}$ at 5% level of significance at 8 d.f
FUDCO	0.046	0.4055	0.1134	2.306

The above table describes the result of t-test or significance of regression co-efficient between inventory and profit. The tabulated value is taken at 5% level of significance based on 8 degree of freedom ( $n_1+n_2-2=8$ ) is 2.306.

On the basis of above result the tabulated value of FUDCO is 2.306 which is greater than the calculated value of t i.e.  $t_{tab} 2.306 > t_{cal} 0.1134$ . It may be concluded that null hypothesis is accepted. It means the slope of regression co-efficient is insignificant i.e. dependent variable does not significantly depend upon set of independent variable or profit is not significantly dependent upon inventory.

#### 4.6 Ratios relating to Inventory Management

##### 4.6.1 Inventory Turnover Ratio

It measures the efficiency on inventory management and how quickly inventory is sold. It indicates the cost of goods and investment level.

In general high turnover ratio is better than low ratio. High turnover ratio indicates good inventory management; finished good's are quickly sold over period of time and firm is able to earn profit. Similarly, a very low inventory turnover ratio signifies excessive inventory is over investment in inventory. Low inventory turnover shows firm has more stock of finished goods for sales. Due to this, inventory involves cost in terms of interest of blocked amount, rent of ware house, damage, and deterioration and so on. A low ratio may be result of obsolete goods over valuation of closing stock, reduce demand in market, more purchase of

raw-materials in anticipation of future increase in their process and so on.

Therefore, the company has to keep optimum level of inventory. Through the study of inventory turn-over ratio, it helps to detect the imbalance investment in the various inventory components. Inventory turnover ratio can be calculated by using the following formula.

$$\text{Inventory Turnover Ratio} \times \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

**Cost of good sold = Opening stock + Purchase + Direct Expenditure – Closing Stock.**

Table 4.12

Inventory Turnover Ratio in Term of Value (Rs in Lakhs)

Fiscal Year	Cost of Goods Sold	Average Inventory	Turnover Ratio (Times)
<b>2003/04</b>	<b>5752.91</b>	<b>159.70</b>	<b>36.02</b>
<b>2004/05</b>	<b>8103.53</b>	<b>194.33</b>	<b>41.70</b>
<b>2005/06</b>	<b>8630.76</b>	<b>968.05</b>	<b>8.92</b>
<b>2006/07</b>	<b>8545.24</b>	<b>1809.20</b>	<b>4.72</b>
<b>2007/08</b>	<b>11878.33</b>	<b>2026.24</b>	<b>5.86</b>

In another way, we can compute the inventory turnover ratio by dividing closing stock by sales.

$$\text{Inventory Turnover Ratio} \times \frac{\text{Sales}}{\text{Closing Stock}}$$

In this formulae sales is valued at market price and closing stock is valued at cost price, so it is not comparable. Appropriate formula to calculate is described earlier.

From the above tabulation it is known that inventory turnover ratio of FUDCO is satisfactory. It means inventories are not on warehouse alone

and it is on the processing. Necessary investments tied upon it. It helps to generate the profit of the firm.

#### 4.6.2 Inventory to Current Assets Ratio

**Current assets mean those assets which are held for their conversion into cash with in a year or immediately or already in case. It refers the liquidity position of the organizations. Inventory is the main part of the current assets. In manufacturing public enterprises in Nepal, inventory to current assets ratio should be about 45% to 50%. However inventory to current ratio constitute 60% of public limited companies in India.**

$$\text{Inventory To Current Assets Ratio} = \frac{\text{Inventory}}{\text{Current Assets}}$$

Table 4.13

Inventory to Current Assets Ratio (Rs. in Lakh)

Fiscal Year	Inventory	Current Assets	Ratio (Percentage)
<b>2003/04</b>	<b>139.60</b>	<b>3968.48</b>	<b>3.52</b>
<b>2004/05</b>	<b>249.06</b>	<b>4312.14</b>	<b>5.78</b>
<b>2005/06</b>	<b>1687.03</b>	<b>7291.94</b>	<b>23.14</b>
<b>2006/07</b>	<b>1931.36</b>	<b>5200.37</b>	<b>37.14</b>
<b>2007/08</b>	<b>2121.12</b>	<b>5054.76</b>	<b>41.96</b>

According to above table of inventory to current assets it is clear that the highest ratio is 41.96% in F/Y 2007/08. It is in increasing trend. In the context of Nepalese manufacturing company, FUDCO is not in satisfactory level. From the above calculation, it is clear that the

company has no satisfactory result about inventory to current assets ratio through out the study period. Any company holding more inventories can not mobilize the amount which is blocked in inventory as the company cannot sell it immediately. So it directly affects the profitability of the firm. Due to blocked amount in inventory, the company cannot invest in other areas. So, the company loses the return of that blocked amount in inventory.

#### 4.6.3 Inventory to Total Assets Ratio

**Inventory to total assets ratio is calculated by using following formula:**

$$\text{Inventory to Total Assets Ratio} = \frac{\text{Inventory}}{\text{Total Assets}}$$

**Here, inventory means closing stocks of raw materials, WIP, finished goods, other materials spare, tools, consumable and goods in transit.**

**Total assets mean fixed assets plus current assets.**

Table 4.14

Inventory to Total Assets in Terms of Value (Rs. in Lakh)

Fiscal Year	Inventory	Total Assets	Ratio (Percentage)
<b>2003/04</b>	<b>139.60</b>	<b>7779.94</b>	<b>1.79</b>
<b>2004/05</b>	<b>249.06</b>	<b>7702.89</b>	<b>3.23</b>
<b>2005/06</b>	<b>1687.03</b>	<b>10494.89</b>	<b>16.07</b>
<b>2006/07</b>	<b>1931.36</b>	<b>10296.03</b>	<b>18.76</b>
<b>2007/08</b>	<b>2121.12</b>	<b>10153.89</b>	<b>20.89</b>

**From the above tabulation of FUDCO, it is known that minimum inventory to total assets ratio is 1.79% in F/Y 2003/04 and maximum**

ratio is 20.89% in F/Y 2007/08. According to Brigham inventory to total assets are concentrated within 16% to 30% are optimal ratio. It can be said that FUDCO is trying to keep good ratio of inventory to total assets.

#### 4.6.4 Net Profit Margin

This ratio establishes the relationship between Net profits to net sales and shows the efficiency of management to earn net profit through sales. This ratio helps to determine the operation efficiency of management.

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

Table 4.15

Net Profit Margin (Rs. in Lakh)

Fiscal Year	Net Profit	Sales	Ratio(Percentage)
2003/04	193.25	9992.12	1.93
2004/05	258.25	11111.48	2.32
2005/06	188.10	13177.44	1.43
2006/07	182.48	12531.17	1.46
2007/08	279.05	16400.96	1.70

From the above tabulation of FUDCO, it is known that minimum inventory to net profit margin ratio is 1.43% in F/Y 2005/06 and

maximum ratio is 2.32 in F/Y 2004/05. According to Brigham higher net profit margin is optimal ratio. It can be said that FUDCO is trying to keep good ratio of net profit to sales.

#### 4.6.5 Return on Assets

This ratio shows the relationship of net profits and total assets. It is to determine how efficiently the total assets have been used by the management. This ratio indicates the ability of generating profit per rupee of total assets. It also evaluates the percent return on the total assets as a guide for expected future purchase of assets. Higher ratio shows the more efficient operation of management and lower ratio shows the low efficient operation of management. This ratio is computed by

$$\text{Return on Assets} \times \frac{\text{Net Profit After Tax}}{\text{Total Assets}}$$

Table 4.16

Return on Assets (Rs. in Lakh)

Fiscal Year	Net Profit	Total Assets	Ratio (%)
<b>2003/04</b>	<b>193.25</b>	<b>7779.94</b>	<b>2.48</b>
<b>2004/05</b>	<b>258.25</b>	<b>7702.89</b>	<b>3.35</b>
<b>2005/06</b>	<b>188.10</b>	<b>10494.89</b>	<b>1.79</b>
<b>2006/07</b>	<b>182.48</b>	<b>10296.03</b>	<b>1.77</b>
<b>2007/08</b>	<b>279.05</b>	<b>10153.89</b>	<b>2.75</b>

**The above table shows the maximum fluctuation in the computed ratio. Higher ratio is 3.35% in f/y 2004/05 whereas the minimum is 1.77% in f/y 2006/07 during the f/y 2003/04 to 2007/08. Aggregately it seems to be satisfactory but not enough for FUDCO. Efficient utilization of total assets to generate the profit must be high.**

#### **4.7 Analysis of Primary Information Collected Through Questionnaire**

**To make the research work more effective and accurate, some primary data were collected through questionnaire distributed to company's employees serving in different post i.e. production manager, purchase manager, sales assistant and store keeper. Questionnaire used are given in appendix A**

**All respondent in total helped in filling up questionnaire. On the basis of answers given by them, the information has been arranged in tabular form which is given below:**

#### **Question No. 1**

**According to respondents answers for question no. 1 "what are the basic motives for holding inventory management in your organization?" 50% of total respondents said Transaction Motives and 50% of remaining respondents gave their view towards Precautionary Motives for holding inventory management in their organization.**

#### **Question No. 2**

**"Does your organization use inventory management?" Three respondents said "yes" and one respondent said "no".**

**Question No. 3**

**"Which method does your organization use for collection of raw materials?" All four respondents said that the factory uses both direct collection method & collection through agent by global tender.**

**Question No. 4**

**"Is there proper target for materials purchase in your factory?" three respondents said in respect to question that there is no proper target for material purchase in factory and one respondent said that there is proper target for material purchase.**

**Question No. 5**

**"Is the factory following EOQ model in purchasing decision?" All respondents said that the factory is not using EOQ model in purchasing decisions.**

**Question No. 6**

**"Is there deviation in the amount of annual needs and annual collection and annual consumption?" Two respondents replied to the question "yes" and two "no".**

**4.8 Major Findings of the Study**

**The inventory management of FUDCO and its impact on profitability has been analyzed by using different tools revealed amicable performance of the factory. However, data analysis and interpretation of FUDCO reveals the major findings as follows:**

From Secondary Data:

- **The investment in inventory stock of FUDCO is in large amount, the value of inventory stock is in fluctuating trend.**
- **The consumption pattern of the industry is also fluctuating from year to year like purchasing pattern. This shows that the company is not able to utilize its existing capacity in the production of finished product.**
- **The trend of demand and supply of raw material is increasing each year throughout the study period.**
- **The production cost is in increasing trend. So, we can conclude that there is a high deviation in the amount of annual needs, collection and consumption.**
- **Sales were not synchronized properly as a result although there was an increase in total sales amount but no increase in gross margin. The sales was Rs. 9992.12 lakh in f/y 2003/04 and it is increased by 11.20%, 31.88%, 25.41%, and 64.14% amounted to Rs. 11111.48 lakh, 13177.44, 12531.17 and Rs. 16400.96 lakh from f/y 2004/05 to 2007/08 respectively.**

- **The trends of net profit are also in fluctuating trend. In f/y 2003/04 the net profit was Rs. 193.25 lakh and then it is decreased frequently for upcoming two year by –2.66% and –5.57% comparing with the base year 2003/04. So, we conclude that by fighting with various kinds of factors and following good production system as well as by maintaining regular sales system the company earns net profit but instability in net profit is the major problem for company.**
- **The inventory turnover ratio of five years study period (fiscal year 2003/04 to 2007/08) were 36.02x, 41.70x, 8.92x, 4.72x and 5.86 times respectively. The highest inventory turnover ratio is 41.70x times in f/y 2004/05 and the lowest is 4.72 times in f/y 2006/07. Inventory turnover ratio of FUDCO is satisfactory. It means inventories are not on warehouse and necessary investment tied up on it.**
- **The highest inventory to current assets ratio is 41.96% in f/y 2007/08. It is in increasing trend. In the context of Nepalese manufacturing company, it does not any satisfactory situation about inventory to current assets ratio which are 3.52x, 5.78x, 23.14x, 37.14x and 41.96x from f/y 2003/04 to 2007/08 respectively.**
- **Minimum inventory to total assets ratio is 1.79% in f/y 2003/04 and maximum ratio 20.89 times in f/y 2007/08. According to standard, the inventory to total assets ratio are concentrated in 16% to 30% are optimal. So, we can say that FUDCO is trying to keep good ratio.**
- **Net profit margin of FUDCO is very fluctuating. The highest net profit margin ratio is 2.32% in f/y 2004/05 and lowest is 1.43% in f/y 2005/06. FUDCO is not able to**

maintain 5% net profit margin. It indicates the poor efficiency of management.

- In FUDCO, maximum fluctuation is seen about return on assets ratio. Highest ratio is 3.35% in f/y 2004/05 whereas the minimum is 1.77% in f/y 2006/07 during the f/y 2003/04 to 2007/08. Aggregately it seems to be good but not so enough.
- The correlation co-efficient between purchase and inventory, sales and inventory, purchase and sales, net profit and inventory are all positive i.e.  $r = 0.8634, 1.4., 0.9963$  and  $0.3054$  respectively.
- The regression analysis between inventory and purchase of FUDCO is positive regression co-efficient, i.e.  $0.1646$  which implies positive impact of purchase on inventory. The coefficient of determination  $R^2$  of FUDCO is  $0.7807$  and indicates that  $78.07\%$  variation in inventory is explained due to variation in purchase. Similarly, checking the significance of regression co-efficient by applying t-test, the regression co-efficient is statistically insignificant but the slope of regression co-efficient is statistically significant.
- In regression analysis between sales and inventory, the regression co-efficient  $b$  is positive i.e.  $0.2687$  of FUDCO which implies positive impact of sales over inventory. The co-efficient of determination  $R^2$  is  $0.8155$  which indicates that  $81.55\%$  variation on inventory is explained by sales

and remaining by other factors. Checking the significance of regression co-efficient by using t-test of FUDCO the regression co-efficient is statistically insignificant but slope of regression co-efficient of FUDCO is statistically significant.

- The regression co-efficient between inventory and profit (b) is positive i.e. 0.046 which means positive impact of inventory on net profit. The result of co-efficient of determination  $R^2$  is 0.096 which indicates that 9.36 % variation in profit is explained by variation in inventory and rest by other factors. The standard error is 0.4055. Checking significance of regression co-efficient by applying t-test, null hypothesis is accepted. It means there is no significant relationship between inventory and net profit.

From Primary Data

- ) The basic motive for holding inventory management in organization is transaction motives and precautionary motive.
- ) The factory is not following EOQ model in purchasing decisions.
- ) There is no proper target for materials purchases in industry and the prices and quantity of collection of materials are fluctuating from year to year.

- ) The consumption pattern of industry is also fluctuating from year to year like purchasing pattern. This shows that the company is unable to utilize its exiting capacity in the production of noodles.**
  
- ) The consumption and production trend of the factory is decreasing. And the ratio between consumption and production of noodles indicates a fluctuating trend. The trend of material cost and cost price of the noodles are in increasing trend. And there is high deviation in the amount of annual needs, annual collection and consumption. The annual production volume has not been able to meet its production capacity.**

**The trend of demand and supply of raw materials is increasing.**

## CHAPTER-V

### SUMMARY, CONCLUSION & RECOMMENDATIONS

#### 5.1 Summary

**In our country Nepal, public enterprises were established for the purpose of preparing infrastructure required to produce goods in the country, to increase export items, to help in controlling price situation, to create opportunities for employment and increase government revenues and to contribute significantly in the national development as well as to assist in the country's economic advancement.**

**The establishment of import substituting industry in Nepal has a great importance. It is one of the means among other to achieve the goal of the economic development in our country. Such industry minimizes the import of goods on one hand and it employs local resources such as labor and materials within the country on the other hand. Further these industries tend to create employment opportunities and generate revenues in the government exchequer and then it helps to make the balance of payment favorable.**

**The basic objective of the study is to examine the inventory management system as practiced by FUDCO. The present study basically aimed at variables of the inventory management. Research methodology is a tool for scientific study which is supported by collection, analysis and interpretation of data, information, facts and figures, financial and statistical tools.**

**The analysis of the study include analysis of inventory management in FUDCO, analysis of its effect on the present position of inventory**

**management through ratio analysis, regression analysis and correlation analysis, For this purpose the data covering a five year 2003/04 to 2007/08 are picked up.**

**So far the study has a broad scope academically as well as practically. As a master's degree thesis, this thesis has limitations. As the study is concerned with inventory management system of FUDCO and its impact on profitability, the nature and scope of the study is limited to this vary aspect only.**

## **5.2 Conclusion**

**In conclusion, it can be said that Inventory Management is an important part of any manufacturing organization. Many firms become failure due to improper management of inventory. To produce any goods or services, it requires many types of material, direct or indirect. If the firm does not get any required materials at needed time, production system may be disturbed and fail to produce and sale required quantity of products. Keeping more inventory will be expensive as it needs large amount to invest in inventory Not only that keeping large amount of inventory will also increase cost associated with inventory where as keeping minimum amount will create the problem of shortage. Therefore, inventory management plans for required amount of different types of inventory, required period and optimal cost associated in it.**

**Any stock that a firm keeps to meet its future requirement for production and sales is called inventory. The basic reason for holding**

inventory is to keep up the production activities unhampered. Inventories are a part of assets, which are used within one year. In the normal course of business operation, manufacturing organization's inventory are raw materials, work-in-progress, finished goods, spare parts, suppliers etc. Therefore, combination of raw materials, work-in-progress, finished goods and suppliers is called inventory. Managing the stock at lowest cost is called inventory management. In other words, the planning, coordinating and controlling activities related to the flow of inventory into, through, and out of an organization is called inventory management.

Therefore, the main objective of inventory management is to minimize the total cost and maximize profit of firm.

### 5.3 Recommendations

The study stresses the need for a good inventory management system to the better performance of the company. If FUDCO initiates steps to the appropriate management of inventory, certainly it will achieve its set objectives successfully. On the basis of the study, the following suggestions are recommended for consideration.

- ) There is lack of proper planning of purchasing raw materials because the procurements of different raw materials are fluctuating from year to year. FUDCO has not given proper attention to this important segment. So it is suggested that the procurement department with the cooperation of production and marketing department should analyze the annual required

- materials following an appropriate purchasing policies. For this, if possible maximum stock level and re-order level as well as economic lot size should be fixed. This helps the management to strike balance between liquidity and profitability in the company.
- ) There is high deviation in the amount of annual collection and consumption. The annual production capacity is very far from the existing production volume. Due to this the production cost per ton of FUDCO is very high than the material cost per ton. Therefore, FUDCO should purpose production plan on the basis of market demand and try to utilize its means of production effectively.
  - ) If the company is not using its full capacity, the production cost would naturally be high. Other things remaining the same, if the production increased the company could make a profit. So FUDCO should utilize its production capacity in full as well as co-ordinate between factors of production.
  - ) The company lacks an effective and efficient inventory management system for controlling inventory. Due to this, the huge money is blocked in the inventory. How much money should the company invest in the inventory? How much inventories should be stocked? How can we minimize the inventory cost? What is the optimum EOQ? and what is optimum ROP ? are the questions which the company should pay more attention for the better performance.
  - ) In the respect of Inventory to Current Assets Ratio, FUDCO's situation is very poor. During the 5 years study period, the company's inventory turnover ratio is very poor. It indicates

**excessive inventory kept by the firm. In other words, the company has more stock of finished goods for sale. As more inventories are kept in the stock, unnecessary investment is tied up on it. FUDCO is not able to change its inventory into receivable/cash through sales. So FUDCO has to give more attention to improve its inventory turnover.**

**) FUDCO has no plan as to how much working capital should be kept in the form of closing stock of finished goods. Generally 85% of working capital in the form of closing stock of finished goods is considered as an ideal ratio. But unfortunately, during the study period we do not find such optimum ratio. So it is better to improve the relationship of closing stock of finished goods and working capital.**

**) Material is an important item of inventory in production and in manufacturing organization. Proper material management is not found in FUDCO. Studies by experts in this field have brought out that, if an organization can affect 5% saving in material cost, it would be as increasing the production or sales by about 36%. Hence the company is advised to enhance the materials control mechanism.**

## BIBLIOGRAPHY

### BOOKS

**Acharya, Rajeshwor Pd., Pradhananga Shila....etc. (2006) Cost and Management Accounting, Kathmandu: Asmita Books & Stationary**

**Agrawal, Dr. Govinda Ram (2003) Marketing in Nepal: Fundamental Management & Strategy, Kathmandu: Educational Enterprises**

**Bhatarai, Gyaneshwor (2061) Brihat Gyankosh, Kathmandu: Ashish Pustak Bhandar**

**Dangol, R.M. Profit Planning and Control, Unpublished Edition**

**Doubler, D.W. and Burt D.N. (1999) Purchasing and Supply Management, New Delhi: Tata McGraw- Hill Publishing Company Limited**

**Eugene, Laughin (2003) Financial Accounting, Kanas State University**

**Everett, Adams & Jebert Jr. Ronald, Production & Operations Management, New Delhi: Prentice Hall of India Pvt. Ltd.**

**Ezra Solemn (1995) Theory of Financial Management, New York**

**Garrett, L.I. and Silver Milton (1986), Production and Operations Management Analysis, New York: Harcourt Brance Jovanovich**

**Goal, Man Mohan & Shiva N. (1997) Principle of Management Accounting, Agra-282003: Bhauvan Printers**

**Goel, S.L. (1999) Modern Management Technique, New Delhi: Deep & Deep Publication**

**Hampton, John J (1986), Financial Decision Making, New Delhi: Prentice-Hall of India Private Limited.**

**Handling G. and Whitin TM (2004), Analysis of Inventory System, Eagle Wood Diffs: New Jersey Printice Hall.**

**Jain, S.P. & Narang K.L (1993), Financial and Management Accountancy, New Delhi: Kalyani Publisher.**

**Joseph Buchan and Ernest Koenigsberg (1970), Scientific Inventory Management, New Delhi: Prentice Hall of India Private Limited.**

**Joshi, Dr. Shyam (2059), Public Enterprises Management, Kathmandu: Taleju Prakashan.**

**Khanal, J.R. & Basnet D.K. (2004), Accountancy Practice Book (For class 9,10 & SLC Level), Kathmandu: Asmita Books and Stationary.**

**Megee, John F (1990), Guides to Inventory Policy, II Harvard Business Reviews.**

**Moyer R, Charies, McGuigan James R & Kretlaw William J (1999), Contemporary Financial Management, Nepal Accounting Standards (2003), Kathmandu: Accounting Standards Board**

**Regmi L.K., Joshi P.R., Chaudhary A.K., Fago G. (2004), Production and Operations Management, Kathmandu: Buddha Academic Publishers & Distributors Pvt. Ltd.**

**Saradi, Vijara (1982), Working Capital Management in Public Enterprises, Yugoslavia: International Centre for Public Enterprises in Developing Countries.**

**Weston, J.F., Bisley S & Brigham E.F. (1996), Essentials of Managerial Finance, USA: The Dryden Press.**

THESES

**Dahal, Purusotam Prasad (2006), A Comparative Study on Inventory Management of Dabur Nepal Pvt. Ltd and Nepal Lever Ltd, Unpublished Master Thesis, Department of Nepal Commerce Campus, Minbhawan.**

**Gautam, Vibhas (2005), A Study of Inventory Management of Nepal Oil Corporation Limited, Unpublised Master Thesis, Department of Nepal Commerce Campus. Minbhawan.**

**Gurung, Rajesh (2001), A Study of Inventory Management of Nepal Oil Corporation Ltd, Unpublished Master Thesis, Department of Nepal Commerce Campus. Minbhawan.**

**Pathak, Anju (2007), Inventory Management of Hetauda Cement Industries Limited, Unpublished Master Thesis, Department of Nepal Commerce Campus, Minbhawan.**

**Upadhaya, Pramod Raj (2004), A Study on Inventory Management in JCF, Unpublished Master Thesis, Department of T.U, Kirtipur.**

Appendix-A

Request Letter

**Dear Respondent/Participant**

**I am a student of Nepal Commerce Campus. I am going to conduct a research on the topic "Inventory Management in Food Production Complex of Chaudhary Group" in partial fulfillment of the requirements for the degree of MBS. The reply will be kept secrete and used for only research purpose. Information provided by you is treated as confidential in this research. Your participation will be as a volunteer.**

**This research is conducted to know effectiveness, problem and prospects of Inventory Management in an organization. This academic research will have findings of significance and value to society in general. Your help will be highly appreciated.**

.....

.....

**Researcher's Name & Signature**

**Date**

**Scheduled and Structural Questionnaire to Official.**

**Name:**

**Department:**

**Post:**

**Please tick (✓) the appropriate answer as per your opinion from the following answers:**

**1. What are the basic motives for holding inventory in your organization?**

**a. Transaction Motives**

**b. Precautionary Motives**

**c. Speculative Motives**

**d. Others**

2. Does your organization have the system of inventory management?

a. Yes

b. No

3. Which method does your organization use for collection of raw materials?

a. Direct Collection Method

b. Through Agent by Global Tender

c. None of them

4. Is there proper target for materials purchase in your factory?

a. Yes

b. No

5. Is the factory following EOQ model in purchasing decision?

a. Yes

b. No

6. Is there deviation in the amount of annual needs, annual collection and annual consumption of materials?

a. Yes

b. No

7. What are the trend of demand and supply of raw materials?

a. Increasing

b. Decreasing

c. Constant

**d. None**

**8. Is factory able to utilize its existing capacity?**

**a. Yes**

**b. No**