CHAPTER I

INTRODUCTION

1.1 Background of the study

Industrialization is a comparatively new phenomenon in Nepal. Industrial development in Nepal however started getting regular attention of the government since the development plans was started. Several industries were established under the public sector with the technical assistance of foreign countries. By this a large number of manufacturing companies were seen in existence in the public sector also. But the financial position is not growing as the growth of the numbers.

The modern concept of inventory management can be traced to 1915-1922 when some leading profounder like R.C. Davis, H.S.Own, E.F.Clark and K.C.Wilson developed an economic lot size equation which minimized the sum of carrying and ordering cost for particular material whose demand is known and constant.

Manufacturing means any industries that make product from raw material by the use of labor or machinery, which is usually carried out systematically with a division of labor. J.K Soap & Chemicals Industries Pvt. Ltd. is one of the manufacturing and processing companies of soaps which supplies sufficient quantity of quality products at right time at reasonable price. In the context of globalization companies are free to enter the market of any nation. If the finished products are not sufficient to meet the demand of customers regularly, the customers may shift to the other close substitutes resulting into permanent loss to the firm. So to solve the great problem of demand and supply of raw materials and finished products the company should use the scientific techniques of inventory management.

Inventory is any stored resources that are used to satisfy a current or future need for smooth operation of the firm. Large amount of fund should have been invested in inventory. A detailed list of items such as goods in stocks, a person's property, the contents of storage box, room, building, furniture etc. along with a statement giving the nature and value of each item is inventory. So it must be considered that proper management of inventory using modern and scientific accounting systems, methods and techniques as much as possible to achieve the predetermined objectives of the firm. There is no doubt that company which ignores the role of inventory management ultimately declines from today's competitive market. Therefore inventory management plays a great role in continuous sales and production process.

In this era of globalization, tremendous industries were established with a motive of earning profit in both sectors i.e. private and government. They produce both tangible and intangible products. The industries which produce products such as beer, soft drinks, soap, sweet, noodles etc. are called manufacturing industries and the industries that produce service such as Hotel, Consultancy, Parlor etc. are called service industries. For both types of industries, inventory management plays a vital role to achieve their goal of profit maximization through the efficient management of both inputs and output as well.

1.2 Introduction of J.K Soap & Chemicals Industries Pvt. Ltd.

The J.K soap and chemicals industries Pvt. Ltd. is a manufacturing company which was established on 24th Falgun 2054 under the Company Act 2049. It had been started its production from the factory which was situated in Mangalapur, Rupandehi with initially authorized capital of Rs. 35,34,98,800 and paid up capital of Rs. 4,38,00,000. The main shareholders of this company are Ashok Kumar Kasaudhan and Satish Kasaudhan. The main objective for established this company is to provide the best quality product at a reasonable price all-round of the country.

J.K soap industries is employing 85 persons, has a plant with the capacity of producing 30 m. ton per day. Out of 85 persons, 15 are working in top level, 20 are in middle level and remaining persons are working in lower level. The company is producing different varieties of soaps. Basically it has classified its production in to three types. They are laundry soap, detergent soap and bathing soap. Rupa 72%, Kiran, Gagan, Rupa washing pouder and IRIS bathing soap are the main product of the company. These products are marketed all-round of the country, Nepal.

Work in process inventories represents the semi-finished goods. They include those materials that have gone committed to the production process but have been converted into finished goods yet. It is very difficult to separate which materials are in work in process and which are not because the same materials may be raw materials for one industry and the same material may be a work in process as well as finished goods in other industry. It depends on the nature of production. The level of work in process inventories are strongly influence by the length of production period.

For the production of different types of soaps, different types of raw materials are used like palm acid oil, palm fatty acid oil, soap stone pouder, salt, caustic soda and soap color. All these raw materials are imported from neighboring as well as other third countries like India, Malaysia, China and Australia. In the initial years of establishment, it had sold Rs. 80,20,233 values of soaps which increased to Rs. 15, 58, 76,967.63 values of soaps in the fiscal year 067/068.

For distributing the soaps all-round places of Nepal and increasing products sales, various dealers are available at different places like Pokhara, Narayangath, Kathmandu, Baglung, Surkhet, Nepalgunj, Biratnagar, Birgunj and Siraha. The company had given prime importance to its quality product for which it had established well equipped laboratory to assess the quality of raw materials as well as finished product.

1.3 Introduction of Inventory Management

Inventory is one of the most important current assets to any organizations. A huge portion of total capital is invested in inventory. It is a major element in the effects of the firm to achieve desired level of sales. Inventory management can be defined as management of the optimum no of items to be stocked in the store for the certain period of time.

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 person and directed by top management. It involves both financial dimensions as well as physical dimensions and these dimensions are interrelated and can't be looked in isolation.

Inventories make a link between production and sale of a product. Generally inventories are used in manufacturing and non manufacturing companies. The forms of inventories exist in manufacturing companies are:

- Raw materials
- Work in process
- Finished goods
- Parts and supplies

Raw materials are those basic inputs which are generally purchased from outsiders and are converted into finished goods through the production process. Manufacturing firm holds raw material inventories for smooth running of production operation. Materials used in factory traditionally classified as direct and indirect materials and part that can be directly identified with the unit cost of finished goods. Indirect materials are generally defined as the material used in the manufacturing process which cannot be identified. They are only the supporting material of the products. The level of raw material inventories is influenced by anticipated production, reasonability of production, reliability of sources of supply and the efficiency of scheduling, purchasing and production operation.

Finished goods inventories are those completely manufactured products which are ready for sale. In a manufacturing firm, they are the final output of the production process. Manufacturing and non manufacturing company stock of finished goods for market operation holds.

Spare parts are those materials which are used in maintenance and repairing functions and supplies are those materials which are used in operating functions. Bolts, wheels, oil, lubricant, grease etc. represents the spare parts and supplies.

However every company associates inventory as their nature. Manufacturing companies should have raw material mostly as well as work in process and finished goods. The company, in which the processing procedure is long, keeps as the large amount of work in process. But commercial enterprises and wholesalers do not invest their capital on raw material and work in process. They only keep finished goods inventory.

1.4   Statement of the problem

Inventory is an essential element to the organization for generating profit. Generally inventory management covers from procurement of inventory to its distribution. So, how much to purchase? When to purchase? By which supplier should we purchase? How to purchase? We have to consider all these questions seriously. After procurement of inventories we must consider how they are well stored or maintain quality.

Inventory management has a significant role in manufacturing organization as well as service organization. In general, every business firm should keep the stock so that they can get them whenever they require. But both excessive and inadequate inventories are not desirable. The main aim of the inventory management is to maintain optimum level of inventory. The optimum level of inventory lies between two danger points of excessive and inadequate inventories. Excessive inventories indicate overinvestment which creates the

problem of unnecessary tie up of the firms fund; excessive costs, the risk of liquidity and so on although it saves the cost on trade discount. Similarly inadequate inventories are also dangerous. Inadequate raw materials and work in process interrupts frequent production and insufficient finished goods do not meet the demand of customers regularly which is permanent to the firm because customers shift immediately to competitor's goods. Therefore, both have negative effect in profitability of the organization.

For the success of the unit inventory management takes important role because the cost of inventory directly affect the profitability of industry, but in Nepal least attention has been given to this important segment.

The research questions about the problem of the study are given below:

- What kind of inventory management system is being followed by the J.K Soap & Chemicals Industries Pvt. Ltd?

- What should be the optimum level of inventory to reduce inventory management cost?

- What kinds of problem are faced by the J.K Soap and Chemicals Industries Pvt. Ltd. while conducting inventory management system?

- What would be the impact of inventory management on the profitability of the company?

1.5 Objectives of the study

The main aim of the study is to identify the underlying constraints in existing inventory management and control system and their impact on the profitability of the J.K Soap and Chemicals Industries Pvt. Ltd. The major objectives of the study are given below

- To analyze the techniques used by the company to determine level of inventory.

- To identify the optimum level of inventory to reduce inventory management cost.

- To assess the inventories and their consequences on profitability of company.

1.6 Significance of the study

Inventory management is one of the most important functions in an organization. No any organization can achieve its goal without effective inventory management. Only effective inventory management can help organization to increase the profit. A little bit change in cost of inventory can bring a great change in the firm's profitability.

Inventories of raw materials or partially processed goods can help a company complete the production cycle in a much shorter time. Therefore, it is said that inventory for any organization is a necessary evil. Inventory management is an important concern for all types of the business. Every business organization however big or small has to maintain some inventory. Inventory helps the company quickly responding to the customer demands which is an important element of competitive strategy. Inventories of finished off the correct items to meet the market at the different point of the time within a reasonable, response time play an important role in a company's ability to compete in the market.

It is not hidden from anyone that most of Nepalese organizations are suffering from poor inventory management. It is rare case that a business can operate in the absence of inventories. In practice, it is usually found necessary to maintain inventories of raw material; semi finished goods and finished goods. It has already been started that inventory, plant capacity and labor can be regarded as inter changeable within limits. Generally this study is based on inventory management in J.K Soap& Chemicals Inds. The conclusion comes from this study will be useful to the J.K Soap & Chemicals Indus. as well as other print media. Other researcher will get benefit from this study.

1.7 Limitation of the study

Each research study has its own limitation. The study will have following limitations:

- The study is concentrated on only the area of inventory management of J.K Soap & Chemicals Industries Pvt. Ltd.
- Since this is the case study, the conclusion derived from the study is not applicable in all types of organizations.
- This study covers only a period of seven years (2062/63 to 2067/68).
- The study is based on data provided from organization and other available resources. Hence this study is based on secondary data as well as primary data.
- It's not a comparative study of similar nature undertaking.

1.8 Organization of the study

This study is divided into five different chapters which are given below:

The first chapter consists of the Background of the study, Introduction of J. K. soap and Chemical Industries Pvt. Ltd., Inventory Management, statement of the problem, objectives of the study, significance of the study, limitation of the study. The second chapter is concerned with review of the conceptual framework, Inventory Management, Classification of cost, Just in time inventory, Inventory and Financial Manager, Review of Related studies and Research Gap. This chapter deals with Introduction, Research Design, Population and Sample, Nature and Sources of data, Data Collection Procedure and Analytical Tools. Third chapter consists of Purchasing Procedure Practice in J.K. Soap and Industries, Store control Device Practice in J.K. Soap Industries, Issuing Materials, Inventory Management Analysis, Trend Analysis, Major Finding. Finally the last chapter five consists of summary, conclusion and recommendation of the study.

CHAPTER- II
REVIEW OF LITERATURE

A literature review is an essential part of all studies. It is a way to discover what other researchers have covered and left in the area. A critical review of the literature helps the researcher to develop a thorough understanding and insight into previous research works that relates to the present study. The literature review is designed to familiarize the investigator with any relevant information pertaining to the topic being studied (Black & Champion, 1976:107).

It is also a way to avoid investigation problems that have already been definitely answered. Thus a literature review is the process of locating, obtaining, reading and evaluating the research literature in the area of the student's interest (Wolf & Pant: 2006:140).

The purpose of literature review is to find out what research studies have been conducted in one's chosen field of study and what remains to do. The primary purpose of literature review is to learn not to accumulate.

2.1 Conceptual Framework

After the great depression of 1930s and before second Great world war the American economy as well as world economy was plagued by capacity utilization, material shortage, inflation and high interest rates. That situation made the mangers of the organizations pay much attention in inventory. So the various concepts and techniques have been developed in this regard.

In this chapter, various terms, concepts and principles developed by the researchers have been defined as used in this investigation. The terms such as ordering cost, holding cost i.e. capital cost, operational cost (handling cost), spoilage & shortage cost, insurance cost & stock out cost under cost concept and economic order quantity (EOQ), ABC analysis, safety stock calculation,

Re-order level calculation & techniques in inventory valuation under technical approach have been discussed in detail.

2.2 Inventory Management

The term inventory refers to assets, which will be sold in future in the normal course of business operations. The assets that the firm stores as inventory in anticipation of need are raw materials, work in process (semi finished goods) and finished products.

Inventory is an idle resource which is useable and has value. The idle resource may be man, material, plan requirement. Of course inventory is an item of current assets which is the most important for the successful run of any enterprise whether it is commercial or manufacturing. Mainly raw material, semi-finished goods, finished products and parts and supplies are the forms of inventory (Ahuja, 1993: 310:240).

Raw material inventory provides flexibility in the purchasing of raw materials. It is necessary to buy raw materials in line with its production schedule. Conversely, raw materials inventory may be bloated temporarily because the purchasing department may take the advantage of quantity discounts. The level of raw materials inventories will be influenced by anticipated production, seasonality of production, reliability of sources of supply and the efficiency of scheduling purchase and production operations. Example of raw materials is flour for Bread Company, sugar for sweet industries etc.

Finished goods inventory allows the firm flexibility in its production scheduling and its marketing. The level if finished goods inventory is a matter of co-ordination of production and sales. The financial manager can stimulate sales by changing credit terms or by granting credit to marginal risks. But whether the goods remain on the books as inventories or as receivables the financial manager has to finance them. Many times, firms find it desirable to make the sale so that they are on a step nearer to realizing cash.

Inventory of parts and supplies includes spare parts such as bolt, knot, oil, lubricants, grease etc. these materials do not enter directly to the production but are most necessary for the production. Usually, these parts and supplies are small part of the total inventory and do not involve significant investment.

Any sort of item that a firm kept in meeting the future requirement of production and sale is called inventory. The basic reason for holding inventory is to keep up the production activities unhampered. It is neither physically possible nor economically justifiable to wait for the stocks to arrive at the time when they are actually required. Therefore, keeping of inventory is must for the efficient working of business unit (Jain and Narang, 1994: 109).

A manufacturing company generally holds four kinds of inventories namely, raw materials, work in process, finished goods and spare parts and supplies. The need of inventories is for the transaction motive, precautionary motive and speculative motive.

Management is an art, which is devoted for planning, directing, co-ordinating and controlling different activities to achieve the predetermined goal. Thus, inventory management can be defined as the planning, directing, co-ordinating and controlling of various activities which are concerned with inventory management.

Capital investment is required for the holding of different kinds of inventories. Excessive inventory increases the capital investment and inadequate inventory causes the obstacle in smooth running of production and market operation. So, excessive and inadequate is not desirable. Inventory should be maintained in appropriate level so as to avoid both under and over stock situation. Thus, main aim of inventory management is to avoid excessive and inadequate level of inventories and to maintain optimum level of inventory for the smooth production and sales operation. The term "Inventory Management" is composed of two different words 'inventory' and 'management'. Inventory is

the stock of materials hold by a firm to meet its future requirement of production and sale. In other words, inventory refers to any stock hold by a company for smooth running of production and market operation. It is a kind of current assets in which huge part of working capital is invested. Therefore, inventory is essential for smooth running of manufacturing as well as trading firms. Lack of inventory affects not only the continuous production of goods but also affects smooth supply of finished goods.

Therefore, inventory management is mainly concerned with minimizing investment on inventory on one hand and minimizing cost of inventory management on other hand. Both physical as well as financial dimensions of inventory should be managed effectively. The main duty of top level management is formulating plan and policies that will be helpful to maintain optimum level of inventory investment for achievement of desired goal (Bose De, 2004: 230).

Generally inventory management covers the function of:

- Purchasing
- Store keeping
- Issuing and pricing

a. Purchasing

Purchasing to a manufacturing company is of extreme importance because it has its own bearing on every vital factor concerning to the manufacture i.e. quantity, quality, efficiency, economy, prompt delivery, volume of production etc. it is the scientific purchasing that can save much money, time and efforts of the management.

In manufacturing company ' purchasing is the procuring of materials, supplies, machines, tools and services required for the equipment maintenance and operation of the business,' Purchasing must be of the right quality in proper

quantity delivering at the right time at the most favorable price from outside company.

In the words of industrial matter 'purchasing is the procurement by purchase of Alfred and Beauty. Principles of industrial the proper materials, machinery, equipment and supplies of stores used in the manufacture of a product adopted to marketing in proper quantity and quality at the proper time and the lowest price consistently with the quality desired.

In simple words, the task of purchasing is related to going the open market finding the desired materials at the lowest possible price and selecting the supplier who offers it at that price taking the quality of the materials in mind.

Objectives of purchasing

The major objectives of scientific purchasing may be stated as follows:

- Procurement of required quality and quantity of materials at the best price not necessarily at the lowest price
- Procurement of materials which best suit the product and the purposes for which they are intended
- Purchasing for time utility by schedule, sufficiently in advance of the demands of the production department so that the production work shall not suffer due to lack of raw materials
- Buying the quality, which is neither too much that involves belonging of the capital nor too little that holds up the regular supply for production
- Improvement of the product with reference to quality and distribution by means of selection of adequate materials
- Maintaining continue supply to ensure production schedule at a minimum investment
- Avoidance of duplication of materials, leading to waste of materials and equipment

- Maintenance of company competitive position in the market by having company's quality standards in accordance with the demands of the consumers.

- Creation of goodwill for the company through dealings with supplies.

- Developing fullest co-operation and co-ordination maintaining internal relationship among various departments of the company.

Purchasing procedures

The main steps in purchasing procedure may be listed as follows:

- Purchase requisition: The initiation of purchase begins with the formal request from the various sections or department to the purchase department to order goods. The request is made in purchase department by the departments needing the goods authorizing the purchase department for procuring the goods as per specification given in the slip by mentioning date on it.

- Decision of purchase: On receipt of the purchase requisition, the purchase department the decides what and how much to buy taking into consideration of various limitations and constraints in purchasing the goods. As far as possible the raw materials or plant and equipment, the necessary permission should be taken from the authority concerned and the finance department to release the fund.

- Study of market condition and sources of supply: Having taking the decision for the purchase of materials, the purchasing agent should study the market condition on the basis of market reports as to when and what goods should be purchased. An intensive study should also be purchased. An intensive study should also be made in regard to the source of supply from where the goods can be procured with the help of catalogues, directories, old records, pricelists of vendor and purchase records etc.

- Selection of vendors: On the basis of the studies of market conditions and sources of supplier the purchasing agent selects the vendor keeping

in mind the reliability, his price movement history, his delivery record and other service required and his past co-operation. Sometimes supplier is selected out of the list of suppliers registered with the company for the supply of goods or sometimes quotations or price bids or tenders are invited from the prospective suppliers. Through the study of supply and the quality and quantity of goods, a vendor is selected out of the bidders or tenderizer.

- Purchase order: After selecting the vendor, a purchase order is prepared in the prescribed form by the purchase department and sent to the vendor authorizing to supply specified quantity of quality of materials at the stipulated terms, at the time and place mentioned therein. It forms a formal contract between the purchase and the vendor.

- Receiving materials: When goods arrive they are taken delivery and time receiving clerk checks material with the order placed by the purchasing department to the vendor. After proper checking, goods should be delivered to the store department or to other department that requisitioned them. On checking if any discrepancy is found as regards to quality or quantity, it should be referred to the purchasing department so that discrepancy may be adjusted.

b. Store keeping

Materials form a high percentage of the cost of production of product. It is therefore necessary to have a close watch in the proper use of the materials. The best method of maintaining materials properly is store keeping. Store keeping is a service function in a manufacturing concern, which deals with the physical storage of goods under the custodian of well-trained and experienced person termed as storekeeper. Raw materials are usually known as stores and the place where such stores are kept is known as storeroom. Store keeping is that aspect of inventory control, which is concerned with the physical storage of goods. The responsibilities of store keeping management are to receive materials to protect them in storage from the materials in the right quantities at

the right time to the right place and provide these services promptly and at least cost (Maynard,1998:90).

Storekeeping should be given due place in the organization otherwise the material handling will add to the cost of production. The importance of store keeping has not been properly recognized by the manufacturing organization so far. Many organizations spend lavishly on machines and wages while store keeping is ignored and stores are housed in camped quarters, ill equipped and ill ventilated. Storekeepers are also ill paid in comparison to others in similar status. All these caused are responsible for wrong of short issue. Loss of stock of raw materials, unexpectedly running out of stock and preparation or incorrect vouchers all these lead to theft and pilferage of stock and delay in production.

In the light of the above explanation storekeeping can be described as the keeping of materials in stores in a scientific and systematic way.

Objectives of store keeping
Receiving, handling and issuing goods economically and efficiently
- Using the storage available space and labor effectively
- Protection of all goods in stores against all losses from fires, theft and obsolesce
- Minimizing the investment on inventories
- Maintaining regular supply of raw materials at all times when properly authorized
- Facilitating regular supply of raw materials at all times when properly authorized
- Facilitating ordering of required materials
- Minimizing the inventory holding cost

To achieve the above objectives a firm generally uses different types of controlling devices.

Bin cards: A bin card makes a record of the receipts and issue of materials and is kept for each items of stores carried. The storekeepers maintain these cards and he himself is responsible for any difference between the physical stock and the balance shown in the bin card. These cards are used not only for recording receipts and issues of stores but also assist the storekeeper to control the stock. For each item of store, minimum quantity, maximum quantity and ordering quantity are stated on the card. By seeing the bin card the storekeeper can send the material requisition for the purchase of material in time.

Store Ledger: This ledger is kept in the costing department and is identical with the bin card except that receipts issues and balanced are shown along with their money values. This contains an account for every item of stores and makes a record of the receipts, issues and the balances, both in quantity and value. Thus, this ledger provides the information for the pricing of materials issued and the money value of any item of each item of stores (Jain & Narang, 1991: 237).

c. Issuing and pricing

Materials should be issued against materials requisition slip. The prices of the issues can be determined on the basis of cost price or market price.

2.2.1 Objectives of inventory management

Main objectives of inventory management are:

- To maintain large size of inventory for efficient and smooth production and sales
- To maintain a minimum investment in inventories to maximize profitability.
- To achieve the above objectives inventory management should perform following functions (Panday, 1993: 395).
- Continuous supply of raw material without obstruction for smooth production operation

- Provide enough raw material to cope with the situation when there is lack of raw material supply and price change in future

- Maintain enough finished goods inventory for effective market operation and customer service

- To minimize carrying cost and time

- To control investment inventories and maintain optimum level.

2.3 Classification of cost

Cost is certainly a considerable factor in purchasing, production and maintaining inventory. To solve cost problem, the decision factors are when to purchase and how much to purchase at a time. The various factors should be composed and are applied to use the mathematical techniques in order to get the optimum and ideal inventory management system to bring the least cost consequence to the company. Lack of adequate knowledge regarding inventory policies to production manager and absence of formal records derives critical situation for economy purchase.

The principle cost involved in maintaining inventory can be classified as:

i) Holding cost / carrying cost

Cost incurred for maintaining a given level of inventory is called carrying cost. Carrying cost varies with inventory size. This behavior is contrary to that ordering cost which decline with increase inventory size. The carrying cost includes the cost incurred in the following activities (B.K ,1994:39).

- Opportunity cost or cost of capital

- Warehousing cost

- Handling cost

- Clerical and staff

- Insurance and taxes

- Determination and obsolesce

Carrying cost is the first category of inventory management cost which is generally associated proportionally with the average value of inventory. The total carrying cost is calculated as follows (Soleman, 1989: 181).

Total carrying cost (TCC)= (C%) (P) (AI)

Where,

C%= Percentage of cost of carrying inventory which is calculated by adding the cost of capital tied up, storage, insurance and taxes etc. and dividing it by the average inventory value.

P= Price per unit of inventory

AI= Average inventory in units i.e. order quantity (Q) divided by two plus safety stock (S) if any, assuming a constant rate of consumption of inventory.

AI= Q/2 + S

ii) Ordering cost

Ordering cost is the entire cost of acquiring raw material. Ordering cost increases with the number of order. Thus, more frequently is the inventory purchased, higher the firm's ordering cost? On the other hand, if the firm maintained large inventory levels there will be few order placed and ordering cost will be relatively small. Thus ordering cost decreases with increasing the size of inventory. The ordering cost includes the cost incurred in the following activities:

- Purchase requisition
- Purchase order
- Transportation

It is the second category of inventory maintenance cost. Generally this cost is fixed in nature with some exception. This cost involves both fixed and variable costs, assuming the ordering cost (O) if fixed per order, the total ordering cost is calculated simply by multiplying 'o' by the number of times to be ordered

per year. Therefore, total ordering cost is calculated as follows (Pradhan, 1992:181).

Total ordering cost (TOC) = (O) (N)

$$= (O) (R/Q)$$

Where,

O = Cost of placing an order

N = Number of times to be ordered per year

R = Annual requirement

Q = Quantity per order, where quantity per order is equal

iii) Safety stock cost:

The third category of inventory cost is the cost of maintaining safety stock. At this point, it should be noted that (TCC) includes the cost of maintaining safety stock, if TCC is using average inventory (AI). In other words,

TCC = (C %) (P) (AI)

Where,

C% = Percentage of cost of carrying inventory

P = Price per unit of inventory

AI = Average inventory

The cost of maintaining safety stock may be needed to calculate separately to account for the cost of maintaining safety stock for some other reasons. It is calculated simply by multiplying the carrying cost per unit by the safety stock.

Cost of safety stock (CSS) = (C %) (P) (S)

Now we can calculate the total cost of maintaining inventory (TCMI) by summing up all the cost. We can get TCMI by combining TCC, TOC and CSS (Pradhan, 1992: 182).

TCMI = TCC + TOC + CSS or

TCMI = [(C %) (P) (AI)] + [(O) (N)] + [(C %) (P) (S)]

Where,

TCMI = Total cost of maintaining inventory

TCC = Total carrying cost

TOC = Total ordering cost

CSS = Cost of safety stock

C% = Percent of cost of carrying inventory

P = Price per unit of carrying inventory

AI = Average inventory

N = Number of orders made during the year

S = Safety stock

O = Cost of placing order.

2.2.2 Techniques of inventory management

In managing inventories the firm's objectives should be in consonance with the wealth maximization principle. To achieve this firm should determine the optimum level if inventory. Efficiently controlled inventories make the firm flexible. Inefficient inventory control results in unbalanced inventory and inflexibility. The firm may be sometimes out of stock and sometimes may pile unnecessary stocks; such situation increases the level of investment and makes the firm unprofitable.

To manage inventories efficiently answer to the following two questions should be sought:

- How much should be ordered?
- When should be ordered?

The first question how much to order, relates to the problem of determining Economic Order Quantity (EOQ) and is answered by analyzing cost of maintaining various levels of inventories. The second question when to order arises because of uncertainty with replenishing time and is a problem of determining the reorder level (Panday, 1989: 395).

a. Economic Order Quantity (EOQ)

The question of how much to be ordered can be solved by the EOQ technique. It always tries to balance the ordering cost and handling costs. In other words, it suggests to the management to order those quantity which would least expensive.

This inventory control technique is widely used these days in many countries irrespective of developed or developing nature. This model determines the optimal order quantity of an individual item of inventory given its forecasted wage, ordering cost and carrying cost (Panday, 1989:395).

i) Ordering and carrying cost trade off

The optimum inventory size is commonly referred to as economic order quantity. It is that size at which annual total cost of ordering and holding are the minimum. We can follow three approaches- the formula approach, trial and error approach and graphic approach to determine the economic order quantity (EOQ). We assume the total annual demand is known with certainty and usage of material is steady. Also ordering cost per order and cost per unit are to be constant (Panday, 1993: 759).

To determine EOQ, different approaches have been illustrated below respectively.

ii) Formula Approach

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

Where,

EOQ = Economic Order Quantity

A = Annual Requirement

O = Ordering cost per order

C = Carrying cost per unit

Illustration

Total requirement (A) = 2000 units

Ordering cost (O) = Rs 80 per order

Carrying cost (C) = Rs 2 per unit

We have,

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

$$= \sqrt{\frac{2 \times 2000 \times 80}{2}}$$

$$= 400 \text{ units}$$

iii) Trial and Error Approach:

The trial and error or analytical approach to resolve the order quantity problem can be illustrated with the help of simple example:

Total annual requirement (A) = 2000 units

Carrying cost (C) = Rs 80 per order

Ordering cost (O) = Rs 2 per unit

Economic order quantity (EOQ) =?

Table: 2.1

Total cost of various orders

1	No of orders	1	2	4	5	8	10
2	Order size	2000	1000	500	400	250	200
3	Average inventory	1000	500	250	200	125	100
4	Ordering cost(Rs)	80	160	320	400	640	800
5	Carrying cost(Rs)	2000	1000	500	400	250	200
6	Total cost	2080	1160	820	800	890	1000

Source: Annual Report

On the above table 400 units is the economic order quantity where the total cost is least i.e. Rs 800.

Where,

No. of order = A/Q

Order size   = A/ no. of order

Average inventory = order size / 2

Carrying cost = CCPU x Average inventory

Ordering cost = No. of order x ordering cost per order

Total cost = Ordering cost + carrying cost

2.3.1.4 Graphic Approach

Total ordering cost curve is increased with the no. of orders increase but it reduces the carrying cost and vice versa. The point where the total cost curve is minimized represents the EOQ.

Figure: 2.1

Graphic Approach
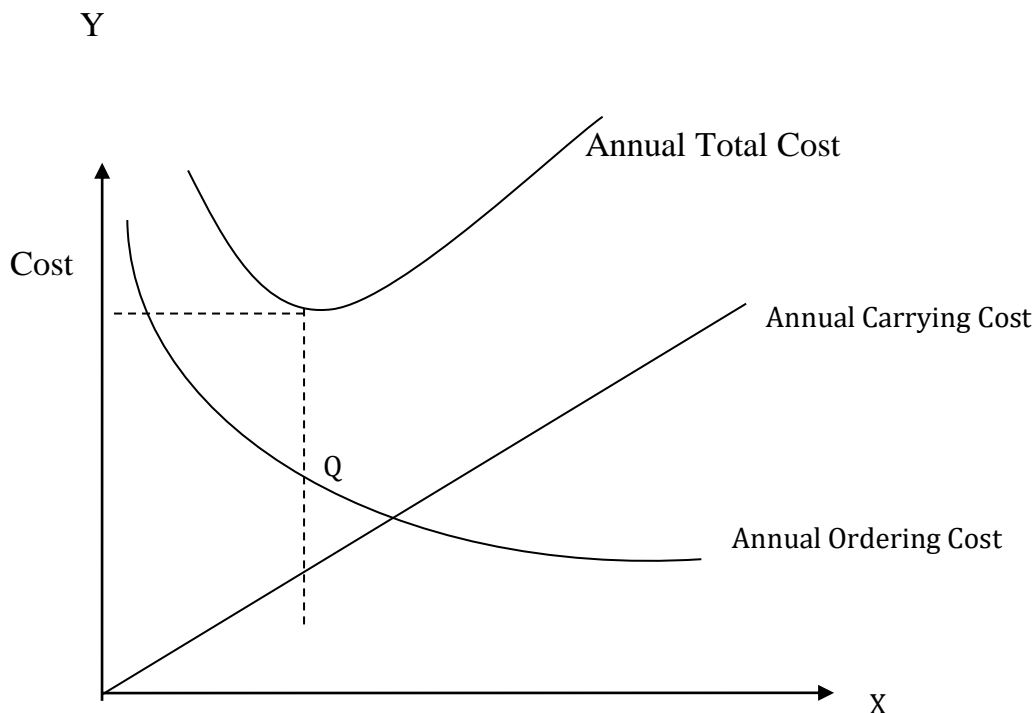
The above figure clearly shows the general behavior of carrying cost, ordering cost and total cost. The total cost line represents the sum of the ordering cost and carrying cost for each order quantity. The minimum total cost occurs at point Q where total carrying cost equals the total ordering cost. These two costs react in opposite to each other for the changes in order size. As the order size goes on decreasing, the total carrying cost also decreases but the total

ordering costs goes on increasing with this. The opposite occurs when order quantity increases.

2.3.1.5 Important assumption of Economic Order Quantity Model

Although EOQ is easier technique to solve the problem of how much to purchase at once but it has some limitations/ assumptions which are as follows (Elwoods, 1992:150).

- Average demands of materials are continuous and constant.
- The lead time is constant. Although this assumption may be valid in many situations, however lead times are often variable. The result of a variable lead time is that receipt of the order produces excess inventories when lead times are shorter than expected and stocks out situations when lead times are longer than expected. The basic model is not appropriate when lead times are variable. Further the deliveries for all 'Q' items are instantaneous rather than over time.
- Independence between inventory items: The EOQ Model assumes that replenishment of one inventory item has no effect on the replenishment and any other inventory item. This assumption is valid items are coupled together by a common production plan.
- Purchase price and price parameter are constant.
- The ordering quantity (EOQ) should be equal to the delivery quantities. If delivers lost are smaller than the average inventories in the EOQ the model is no longer remain valid.

2.3.2 Always Better Control (ABC) Analysis

Most of the organizations have different types of inventories at a time. All the inventories do not have identical value and all the inventories can not be treated and controlled using equal management. So management has to pay attention according to their values. For this, ABC technique has been developed.

This ABC technique has been developed on the basis of 'Thick on the best and thin on the rest'. Under the ABC system materials are classified into three categories: A, B& C. The high value items are classified as 'A' items, least value items are classified as 'C' items and 'B' items fall in between these two categories. The ABC analysis concentrates on important items and is also known as control by importance and exception. As the items are classified in the importance of their relative value, this approach is also known as proportional value analysis (Panday, 1994:406).

The following steps are involved in implementing the ABC analysis:

- Classify the items of inventories, determining the expected use in units and the price per unit for each unit.

- Determine the total value of each item by multiplying the expected units by its unit price.

- Rank the items in accordance with the total value, giving first rank to the item with highest total value and so on.

- Complete the ratios (percentages) of number of units of each item to total units of all items and the ratio of total value of each item to total value of all items.

- Combine items on the basis of their relative value to form three categories A, B&C.

The proportion of category A generally is 10-15% of total units of all items but represents the highest value 70%. On the other hand, item 'C' represents 55% of the total units and only 10% of the total value. Item 'B' occupies the middle place. Item 'A' & 'B' jointly represent 45% of the total units and 90% of the investment. More than half of the total units are item 'C' representing merely 10% of the investment.

The significance of this analysis is that a very close control is exercised over the items of 'A' group which account for a high percentage (70%) of cost

while less stringent control is adequate for category 'B' and very little control would be sufficient for category 'C' items.

Control for class 'A' items: Close control is required for inventory items that have high stock out cost & those items that account for a large fraction of the total inventory value. The closes control might be reserved for raw materials that are used continuously in extremely high volume. Purchasing agents may arrange contracts with vendors for the continuous supply of these materials at desired rates. In such instances the purchase of raw materials is not guided by either economical quantities or cycles changes in the rate of flow are made periodically as demand & inventory position changes. Minimum supplies are maintained to guard against demand fluctuations & possible interventions of supply.

For the balance of class 'A' items periodic ordering, perhaps in a weekly basis provides the necessary close surveillance over inventory levels variations is usage rate are observed quickly by the size of each weekly order according to the periodic system or optimum system. Also because of the close surveillance, the risk of a stock out is small. Nevertheless, buffer stocks that provide excellent service level will be justified for items having large stock out costs.

Control for class 'B' items: These items should be monitored and controlled by a computer based system with periodic reviews by the management. Many of the models discussed in this chapter are relevant for these items. However model parameters are reviewed less often than with class.

Control for class 'C' items: Class 'C' items account for the great bulk of inventory items and carefully designed but routine controls should be adequate. A re-order point system does not require a physical stock evaluation. Such as the two bin systems will ordinarily sufficient. For item action is triggered when inventories fall to the re-order point. If usage changes order will be triggered earlier or later than average, providing the needed compensation semi annual

review of the system parameters should be performed to update usage rates, estimates of supply lead times & costs that might result in changes in EOQ. A periodic review at a long interval can also be used (Richardmomd, 1969:396).

2.3.2.1 Advantages of ABC Analysis

1. A strict control is exercised on the items, which represent a high percentage of the material costs. Managerial time is spent on 'A' items where as 'C' items and sometimes 'B' items can be handled by clerical staff with least managerial supervision. Equal attention to all the items of stores is not desirable because it is expensive.

2. Investment in inventory is reduced to the minimum possible level because a reasonable quantity of 'A' items representing a significant portion of the material costs is purchased to reduce investment in materials, close control of 'A' items contribute much more than close control of 'C' items.

3. Storage cost is reduced as a seasonable quantity of materials, which account for high percentage of value of consumption, will be maintained in the stores. (Jain & Narang, 1995:243).

2.3.3 Safety Stock Calculation

The proper amount of safety stock to maintain depends on several things. The great the uncertainty associated with forecasted demand for inventory the greater the safety stock of the firm will wish to carry, all other things remaining the same. Similarly, the greater the uncertainty of lead time to replenish stock, the greater the risk of running all of stock and the more safety stock the firm will wish to maintain all other things being equal. Another factor influencing the safety stock decision is the cost of running out of inventory. The company being out of raw material and inventories results delay in production. How much does it cost? When production closes down temporarily? And where fixed costs are high this cost will also be quite high? The cost of running out of finished goods is customer dissatisfaction. It is because of low quality, no regular supply of goods & high price. It not only

will lose immediate sale but also endanger the future sale, if customers take their business elsewhere. Although this opportunity cost is difficult to measure, it must be recognized by management & should incorporate into the safety stock decision. The greater the cost of running out of stock, the greater the safety stock will be wished to maintain, all other things being the same.

The cost of carrying additional inventory is very costly to the firm. If it was not the case a firm could maintain whatever safety stock it required to avoid all possibility of running out of inventory. The greater the cost of carrying inventory the more costly it is to maintain a safety stock, all other things being equal. Determination of the proper amount of safety stock involves balancing the probability & cost of a stock out against the cost of carrying enough safety stock to avoid this possibility. Ultimately the question reduces to the probability of inventory stock out management is willing to tolerate *(Vanhorne, 1990:449).*

Safety stock can be determined using statistical methods in different situations.

1. on the situation when demand rate varies:

Safety stock = Lead time (Maximum demand rate – Average demand rate)

2. On the situation when both demand rate and lead time fluctuate:

Safety stock = (Maximum lead time x Max. demand rate) –

(Average lead time x average demand rate)

3. On the situation lead time varies demand uniform:

Safety stock = (Maximum lead time – Average lead time) x demand rate

2.3.4 Re-order Point Calculation

The problem how much to order is solved by determining the economic order quantity (EOQ) but the second problem when to order is solved by determining reorder point.

If order is placed when the stocks are over then there is always a chance that the firm may face the situation of storage. Another alternative is to place an order before the stock is completely exhausted i.e. to order in advance. Again to determine the appropriate time when the order should be placed in advance is a difficult exercise. If an order is placed too early then it may result in piling up of inventory for the longer period and if it is placed too late then this may result in shortages. Both these situations are not in the interest of the firm. The problem is known as 'when to order' & is very difficult for any organization. In other words, the choice of appropriate point at which an order to replenish the inventory at which re-order should be placed is known as re-order level or re-order point (Goal, 1990: 294).

Three items of information are needed input to determine the re-order point subsystems which are given below:

- Usage rate: This is the rate per day at which the items are consumed in production or they are sold to customers.
- Lead time: This is length of time between placing an order & receiving the goods.
- Safety stock level: This minimum level of inventory may be expressed in terms of several days' production and sales.

Safety stock is necessary for an uncertain demand of the customers. The demand for goods may fluctuate day by day or from week to week, if the actual usage or sales go up &n delivery of goods is delayed. The provision of safety stock makes the organization able to face the problem of stock out. Hence, re-order point is calculated as follows:

Re-order point = Lead time x Average usage + Safety stock

2.3.5 Determining critical levels

Maximum stock level

This represents the maximum quantity of an item of material which can be held in stock at any time. Stock should not exceed than this level at any cost. The quantity is fixed so that there may be no over stocking. Over stocking should be avoided because of the following disadvantages:

- Overstocking of materials unnecessarily blocks working capital which could be profitable lying unutilized somewhere else.
- Overstocking of materials will need more go down space so more rent will have to be paid.
- There may be loss due to obsolesce on account of overstocking.
- There are chances of deterioration in quality because large stocks will require more time before they are consumed.
- There may be fear of depreciation in market values of the overstocking of material.

The maximum stock level is fixed by taking into account the following factors:

- Amount of capital available for maintaining stores
- Go-down space available
- Rate of consumption of the material during the lead time
- The time lag between indenting & receiving of the materials.
- Possibility of loss in stores by deterioration & evaporation
- Cost of maintaining stores.

It can be calculated by following formula:

Maximum stock level = Re-order level + Re-order quantity – (Minimum usage x Minimum delivery time)

Minimum Stock Level

This presents the minimum quantity of the material which must be maintained in hand all times. The quantity is fixed so that production may not be held up

due to shortage of the material. In fixing this level the following factors are taken into consideration:

- Lead time i.e. time lag between indenting and receiving of the material. It is the time required to replenish the supply.
- Rate of consumption of material during the lead time.
- Nature of material: Minimum level is not required in case of a special against customer specific order.

It can be calculated by following formula:

Minimum stock level = ROL – (Normal consumption x Normal re-order period)

Where,

ROL = Re-order level

$$\text{Normal Consumption} = \frac{\text{Maximum Consumptio n} + \text{Min.con}}{2}$$

$$\text{Normal re-order period} = \frac{\text{Max delivery Period} + \text{Min.delive ry Period}}{2}$$

(Jain & Narang, 1995: 231).

Danger stock level

This represents a level at which normal issues of material be stopped and issues are made only under specific instruction. The purchases officer 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 stock level can be calculated by following formula:

Danger stock level = Average consumption x Max. Re-order period for emergency purchase

2.3.6 Inventory valuation

In any firm different goods are purchased at different time at different price rate. But the problem to assign value to these goods, emerged to identify the position of current assets of the firm. Balance sheets of the firm should show true and fair view of the financial position of the firm. For these purpose assets

including inventory should be properly valued to exhibit a true and fair view. True profits cannot be calculated unless assets are properly valued.

The false valuation of the inventory directly affects the profit. If inventory is valued at a lower value than actual, the profit will decrease and as result shareholders would get fewer dividends. On the other hand, if inventory is valued more than actual value, the profit would be increased and the shareholders will receive more dividends, a part of which would then be paid out of capital to be insolvent. Moreover, under or over valuation of inventory will not only affect the appearing result these for the next period but will also affect these for the current period will become opening stock for the next period.

Valuation of inventories affects profit of the year. Therefore, method of valuation of inventory should not be changed year to year to enable comparison of profit of valuation of the inventory are as follows:

2.3.6.1 Specific identification method

This method requires that each unit in inventory to be identified with the particular time it be purchased. This is easiest when the items have serial number or are distinguishable by module, color or size because account must be able to identify the particular item in order to find the date of purchase. This is suited to low volume high cost item such as automobile, boat, fur-coat, jewelry etc (Jain & Narang, 1995:262).

2.3.6.2 First in First Out (FIFO) Method

In this method the earlier lots of materials or goods purchased of goods manufactured are exhausted first and closing stock is out of the latest consignment received or goods manufacturing and is valued at the cost of such goods. In other words, cost of goods sold is calculated keeping in view the earliest lots exhausted on the presumption that units are sold in the order in which they were acquired. Similarly, the ending inventory is valued at the unit

cost of most recent acquisitions, which means that the units assumed to be included in the cost of goods sold had been purchased earlier (Shrestha, 1980: 161).

2.3.6.3 Last in Last out (LIFO) Method

As in first in first out method, latest consignments of materials are exhausted first under this method. Therefore, closing stock is valued at the cost of the earliest lot on the other hand the cost of goods sold is based on the cost of recently purchased goods (Jain and Narang, 1995: 264).

2.3.6.4 Weighted Average Cost of Capital (WACC)

This method assumes that goods are removed from the beginning inventory and purchase group in proportion to the number of units in these groups. This method is widely used by organization that holds items in inventory for long period of time. The price is obtained by the total quantity of item in hand.

2.3.6.5 Inflation price method

Under this method, closing stock is valued at a price higher than actual cost to provide normal loss.

2.3.6.6 Higher In First Out (HIFO) Method

This method is based on the assumption that closing stock of items always remains at the minimum value. So lots of the higher cost of materials purchased or goods manufactured are exhausted first. As this method always under values the stock it is not popular. It is based in the monopoly products and cost plus product as well.

2.3.6.7 Market price method

Market price either is the replacement price or the realizable price. The replacement price is used in case of items that are held in stock for use in production while realizable price is used in respect of the items that are kept in stock for sale. This method of valuation of stock is followed when the market

value is lower than the cost so that possible losses may be provided for. This method can also be successfully used for the valuation for obsolete items of stock for a long time (Jain & Narang, 1995: 270).

2.4 Just In Time Inventory

The management of inventory has become very sophisticated in recent years. In certain industries the production process lends itself to 'just in time' inventory control. As the name implies, the idea is that inventories are acquired and inserted in production at the exact times they are needed. This requires efficient purchasing, very reliable suppliers and efficient handling system. One thing that has made this possible is the advent of instant information through sophisticated computer networks (Vanhorne, 1990:450-451).

2.5 Inventory and the financial manager

The inventory control methods give us a means for determining an optimal level of inventory, as well as how much should be ordered and when. These tools are necessary for managing inventory efficiently and balancing the advantages of additional inventory against the cost of carrying it. Computers have opened new words to inventory control and operation research has many applications to inventory management. Monitoring amounts and tied up in inventories are the important aspect of this.

Although inventory management is not the direct operating responsibility of the financial manager, the investment of funds is inventory is an important aspect of financial management. Consequently, the financial manager must be familiar with ways to control inventories effectively. The greater the opportunity cost of funds invested in inventory and the lower the optimum level of average inventory and the lower the optimal order quantity, all others things hold constant. The EOQ model also can be useful to the financial manager in planning for inventory financing.

When demand or inventory is uncertain the financial manger may try to effect policies that will reduce the average lead time required to receive inventory, once an order is placed. The lower the average lead time, the lower will be the safety stock needed and the lower the total investment in inventory will be, all other things held constant. The greater the opportunity cost of funds invested in inventory, the greater the inventory to reduce this lead time. The purchasing department may try to find new vendors that promise quicker delivery, or it may pressure existing vendors to deliver fasting. The production department may be able to deliver finished goods faster by producing a smaller fun. In other case, there is a tradeoff between the added cost involved in reducing the lead time and the opportunity cost of funds tied up in inventory.

The financial manager is also concerned with the risks involved in carrying inventory. The major risk is that the market value of specific inventories will be less than the value at which they were acquired. Certain types of inventory are subject to obsolesce, whether it is in technology may take and electronic component worthless. A change in style may cause a retailer to sell dresses at substantially reduced prices. Other inventories such as agricultural products are liable to physical deterioration; of course, inventories will have to sell at lower and lower prices, all other things being the same. In other situations, the principle risk is that of fluctuations in market price. Some types of inventory such as copper are subjected to rather wide price swings. The financial manager is perhaps in the best place to make an objective analysis of the risks associated with the firms' investment in inventories. These risks must be considered in determining the appropriate level of inventory the firm should carry.

The opportunity cost of funds is the link by the financial manager tries inventory management to the overall objectives of the firm. In this regard, inventory can be treated as an asset to which capital is committed, as any capital budgeting project. Different items of inventory may involve different

risks and these differences can be incorporated into an analysis of risk, similar to that for capital budgeting. We know that greater the efficiency with which the firm manages its inventory, the lower the required investment and the greater the shareholders wealth, all other things being the same (Vanhorne, 1990: 450).

2.6 Review of Related studies

Dangol & Pradhan (2007), In his book of "Cost and Management Accounting" their view of Inventory Management is as follows: The stock of different types of consumable goods held by an organization is called inventory. Inventory is one of the most important liquid of many business concerns. It is also equally important to both governmental and non-governmental sectors. Inventory by nature is a circulating capital and exhausts frequently either by consumption or sale, or by fire or a natural calamity. It occupies a large proportion of the total working capital employed by the firm. Firms generally maintain inventories of stocks to achieve a desired level of sales. The major goal of inventory management is to determine and maintain the optimum level of inventory investment. Two limits must be considered in controlling inventory levels because there are two danger points that the management of the firm wants to avoid. The first is increase the carrying cost as well as obsolescence risk. So neither excess nor inadequate inventory is desirable to the firm. The optimum inventory level lies in between these two danger points. The term inventory describes the stock of consumable items like raw materials, tools, work in progress, etc. awaiting either sale or production utilization. Specially, inventory management requires manager to decide what quantities of materials, Thus, it includes raw- materials, semi-finished or finished and other daily consumable items commonly called supplies. In other words, optimum investment in inventory is the essence of inventory management.

Need to Hold Inventories under as follows.

- Transaction motive.
- Precautionary motive.
- Speculative motive.

Inventory management techniques.

- Stock level: Economic order quantity Mathematical approach Analytical or trial and error or table method Graphical approach Reorder point Safety Stock Minimum stock level Maximum stock level Danger stock level Average stock level Inventory control through ABC analysis: iii) Perpetual inventory system:

Houde (2010): In his book entitled "Advantages of Inventory Management" he has given the following views:

Every business is in need of a good Inventory Management system which shall take care of all its inventory in the net work. Company spend 100 of dollar every year to keep their net work monetary system up dated and to take care of all their net work related issues. No one wants problems like sudden stoppage of work due to poor inventory and due to sudden needs of repairs and renewals.

Companies often face sudden situations when they realize that their work has stopped because something went terribly wrong with their inventory. This problem can be solved with the right usage of Inventory Management system. You need a good management system as per the needs of your business. One of the reading provide of software solution which has helped I.T. Companies in more than one way has come up with an excellent solution in the way of Inventory Management system.

From the various studies of thesis, dissertations business reports and others sources, it is found that no public enterprises are apply modern methods or

techniques to manage as per the requirement. So far the related studies, some studies some on inventory management are considered relevant, which are shown below according to their major findings.

Agrawal (1983) has conducted his study on "Management expert's claims the inventory management in Nepal" is probably the weakest aspect of management the tools and techniques for controlling inventory has been applies in Nepalese enterprises for controlling their physical as well as financial dimension.

Bajracharya (1983) has conducted his study on *"Management Problem in Public Sector Manufacture Enterprises in Nepal"* is one of the important finding was the inventory. This management suffers from lack of planning high carrying cost, poor recoding and stores management and virtual absences of controlling system.

Inventory management is to discover and maintain the optimal level of inventory investment and minimizing the cost of inventory. So, physical and financial dimension of inventory should be effectively managed. If the top management can not be managed efficiently, will be an adverse effect upon profits which is main goal for maximizing the profit of a modern company.

2.6.3 Review of Related Research Work

Mainali (2008) has conducted study regarding "Inventory Management and its impact on Working Capital Management of Unilever Nepal Limited. The following objectives:

To identify the present position of Unilever Nepal Ltd. To know the relationship of sales and inventories. To identify the problem faced by the Unilever Nepal Ltd. In the management of inventory.

Findings:

To asses the inventories and their consequences on profitability of Unilever Nepal Ltd. To suggest for the better practice of inventory management.

Inventory Management and controlled system followed by manufacturing companies are ABC analysis, perpetual inventory management system (Physical checking), EOQ etc.

Recommendation:

There are various problems like political crisis, strikes lockout and transportation problem facing by the manufacturing companies regarding the management of inventories. The company has not been adopting appropriate inventory policy because inventory constitutes the higher proportion of current assets. The company has not followed any type of inventory policies.

Kafle (2009) has conducted a case study in Unilever Limited of " Inventory Management and Its impact on profitability".The following objectives:

To analyze the relationship among purchase, sales and inventories. To sketch optimal inventory level of major raw materials. To identify the relationship between inventory and profit.

Findings:

To provide appropriate suggestion based on the major findings. For the question asked to ULL about the cost of ordering and carrying. The researcher found that there is no systematic and scientific system to determine ordering and carrying cost. The researcher found that the pricing of issues can be determined by value as per weight average cost method. Demand and sales of co. (ULL'S) is very fluctuation. The main reason of such fluctuation is lack if appropriate inventory policy and ineffective demand forecast.

Recommendation:

Specific policy on inventory should be defined and comprehensive   system of inventory management has to be introduced. Inventory should not treat as a reason for investment rather it should be planned has coordinating factor between sales and production. The top level management should pay its attention to the overall management, purchasing, production and financial aspect of factory.

Shrestha, (2009) had conducted the thesis on "Inventory Management and its effects on cash flow of salt trading corporation" submitted to faculty of management of T.U.The following Objectives:

Corporation applied ABC and EOQ technique of inventory management; however it was applied ineffectively and unsystematically. Mean of inventory to current assets ratio was 33.45%. It indicates that the company had not been adopting appropriate inventory policy. To analyze the condition of inventory management and its relationship with other variables like net sales, net profit, purchase.

Findings:

To show the effects of inventory in cash flow of SCT.The company has not adopting appropriate inventory policy. Liquid ratio is not satisfactory during study period.

Findings:

To avoid excess inventory on inventory the co-operation and co-   ordination among purchase, store, marketing and sales department.The company should manage the inventory according to the sales. The company should apply scientific and effective management system.

Recommendation:

The company should manage inventory management system properly. The company should select scientific and effective tools technique. The company should manage inventory under sales and purchase.

Gaire (2009) has conducted a research Topic on " Inventory Management of Bottlers Nepal Limited" submitted of the faculty of management of T.U.The following objectives:

To examine the inventory policy and inventory management by BLM. to assess the inventory management system of BNL is scientific or effective. Inventory Management system of BNL are neither scientific nor effective.

Findings:

The company has not applied just in time management concept which helps to reduce extra expenditure for inventory. The company should follow the proper target for material purchase. The company should increase its existing capacity.

Recommendation:

The inventory purchase and sales maintain by the company are fluctuation severally. The company should consider its vital item, essential items and desirable item.

Yadav (2010) has conducted a research topic on "Inventory Management of National Biscuits and Confectionary Limited NEBICO" submitted to the faculty of management T.U. The following objectives:

To find out applied techniques used to manage the inventory in NEBICO.To present and analyze the inventory management system of NEBICO.To compare sales revenue with production unit and Raw Materials cost. The company does not follow the proper target for material purchase.

Findings:

The company is unable to utilize its existing capacity in the production of biscuits and confectionary. The company has ignored about vital item, essential items and desirable items analysis. The company should apply JIT management concept which helps to reduce extra expenditure for inventory. The inventory management system practiced by the company was unscientific.

Recommendation:

The carrying cost, ording cost, orders size safety stock maintained was unsatisfactory and unscientific.UNL did not pay much attention to the lead time. Unilever Nepal Limited should realistic budget.

The industry has to maintain only required cash balance; not excess cash holding.

Tapol (2011) conducted a study on "*Investment Practice of Commercial Banks in Nepal*".

Objectives:

To measure the financial performance. To find out comparative and competitive position of two JVBs banks of Nepal. Measuring risk of NABIL & NIBL bank. To find out the relationship between different variables like investment, deposits loan and advances, net profit & compare them between NABIL & NIBL.To recommended measure for the improvement of the financial performance and efficiency on the basis of the conclusion drawn from the research.

The mean ratio of return on loan and advances of NIBL is lower than that of NABIL. On the other hand, NIBL's variability between ratios is lower than that of NABIL.The mean ratio of credit risk ratio of NIBL is higher than that of NABIL and NIBL's ratios are more homogenous than that of NABILFrom the analysis of growth ratio, NABIL has lower growth rate on total deposits, loan & advances, total investment and net profit than NIBL. Therefore NIBL has successfully collected and utilized fund amount of its customer than NABIL.Banks are recommended to activate foreign technology and investment in Nepal by means of their wide international banking sector and make Nepalese personnel capable of operating these banks as efficiency as international banks.

2.7 Research Gap

The most of the studies has been considered many more objectives which made their study more complicated but in this research report only four objectives are taken into study. Some researcher uses both primary and secondary data but only secondary data are considered in this research. Both financial as well as statistical tools like ratio analysis, turnover, cash conversion cycle, mean, standard deviation, coefficient of correlation and probable error are used in this research. Latest data are used in this study, nobody had performed study on the same topic and same organization, and nobody had shown the relationship between inventory and different component as sales, purchase, RM, WIP etc. In spite of above, multiple gaps among the researcher's view as well as there is time gap regarding the case study of inventory management. Although there are various studies related to inventory management regarding different organizations and available in different libraries, but review literature indicates that there are few studies devoted to inventory management in Nepalese context. These few studies conducted earlier have now needed to carry out a study to assess the recent development in inventory management.

CHAPTER- III

RESEARCH METHODOLOGY

3.1 Introduction.

In the previous chapter the introduction, related literatures were reviewed for the purpose of this study. In this chapter, the research methodology presents the plan, procedure and tools used to analyze and interpret the available data.

Research methodology is the way to solve systematically about the research problem. It is the process of aiming at the solution of problem through the planned and systematic dealing with collection, analysis & interpretation of fact and figures. The major objective of this study is to analyze the inventory management of J.K Soap& Chemicals Industries. This study tries to focus on how the ideal inventories of the soaps major raw materials could be maintained and how the procurement system could be economic and effective.

For the purpose of achieving the objectives, the following methodology has been adopted which includes research design, nature of data, data gathering procedure and presentation & analysis techniques.

3.2 Research Design

The research design is the plan structure and strategy for investigation of the facts in order to arrive at conclusion. The plan is the overall scheme of program of research. It includes and outlines of what the investigator will do from writing the hypothesis and their operational implications to the financial analysis of data. This research design is planned to obtain the answer of research question through analysis of data. Research is systematic search for knowledge. It applies scientific methods to the study of universe.

The research design of this study will be descriptive as well as analytical. This study is primarily based on secondary data but whatever necessary the primary

data are also collected through interviews with officers and non-officers through personal interview.

3.3 Population and Sample

There are large numbers of manufacturing companies in Nepal but only one company J.K Soap Industries has been selected for this study purpose. Even though various raw materials are used for producing different types of soaps in this company but in data analysis only three materials are used for calculating EOQ and ROL.

3.4 Nature and sources of data

The sources of data for the study will be as well as secondary. Primary data were collected by conducting interview with the officers of company. The secondary data were collected from:

- Studying and analyzing the balance sheet
- Studying and analyzing available unpublished records
- Reports and financial statement of the factory

3.5 Data Collection Procedure

Secondary data were directly collected from various sources mentioned above especially from official records of the company as well as published financial statements from various secondary sources. All the gathered data have been used according to need and requirement of this study.

3.6 Analytical Tools

Collected information has been presented in suitable forms like graphs, tables, figures and charts. For the analysis of collected data various inventory management model have been used whenever necessary. The proposed inventory models are listed below:

a) Economic Order Quantity (EOQ)

The economic order quantity may be defined as that level of inventory order that minimized the total cost associated with inventory management. EOQ can be determined by following way:

- Formula Method
- Table Method
- Graphic Method

b) Re-order Level

The re-order level is defined as the level of inventory at which an order should be placed for replenishing the current stock of inventory and it should be appropriate so the cost associated with the inventory will be minimum.

b = Regression coefficient of change

$\sum Y$ = Total value of dependant variable

$\sum XY$ = Total value of the product of items in the two series

$\sum X^2$ = Total value of the sum of the times in X-series

Here, the trend analysis of purchase, sales, inventory, raw materials, work in process, finished goods and purchase of raw materials are calculated to find out the future trend by the help of past data.

CHAPTER- IV
PRESENTATION AND ANALYSIS OF DATA

The basic objective of this study is to analyze the present practice of inventory management system in J.K Soap & Chemicals Industries. To achieve the said objective, collected data and information are analyzed in this chapter by applying inventory management tools and techniques.

4.1 Purchasing Procedure Practice in J. K Soap Inds.

Purchasing is the first important function of inventory management. So it requires different types of raw material such as palm acid oil, palm fatty oil, soap stone powder, salt, caustic soda and soap color for the production of different types of soaps.

J.K Soap & Chemicals Inds. needs regular supply of different types of raw material for the continuous production operation. Required raw materials for the factory are purchased by using following purchasing procedures.

4.1.1 Collection of Requisition

Purchasing manager of the company collects the purchase requisition slip from the store department for all items of regular use.

4.1.2 Decision for purchase

On the receipt of the purchase requisition, the purchase department decides what & how much to buy?

The level of purchasing raw material directly affects the investment on inventory & cost associated with inventory which ultimately affects the profitability rate of the company. So the company should determine appropriate purchase quantity of raw material to minimize the investment on inventory & cost associated with it. To cope with this situation company may apply the EOQ model to determine the appropriate purchase quantity of

material. But in J. K Soap EOQ model of inventory management is not in practice.

4.1.3 Selection of Suppliers

Required raw materials for the company are not locally available so the company has to import most of the raw materials from India, China, Malaysia and Australia. For the selection of supplier, company should invite bids or tenders from listed suppliers and on the studying the terms of supply and the quality, quantity and price of goods supplier should be selected out of bidders or tenderizers. But sometimes company has imported required material directly from a registered supplier without inviting bids or tender by opening L. C.

4.1.4 Purchase order

After selecting supplier, a purchase order is prepared by the purchase department and sent to the vendor authorizing him to supply a specified quality and quantity of materials at the stipulated terms, time and place mentioned in it.

4.1.5 Receiving and inspecting materials

When materials are arrived they are received and checked by receiving clerk against the order placed by the purchasing department to vendor. After proper checking materials are delivered into the store departments. On checking if any discrepancy is found as regards to quality and quantity, it is immediately referred to the purchasing department to adjust the discrepancy. But sometimes, the purchasing department has not tried to adjust the discrepancy as regarding to quality and quantity.

4.2 Store Control Device Practice in J. K Soap Inds.

Store keeping function includes the function of keeping the materials in the store and keeping their movements. The cost of materials holding in the store directly affects the total cost associated with holding inventories. To minimize

the cost of holding material in the store all company use different types of controlling devices like bin cards, store ledger and ABC analysis technique.

4.2.1 Bin cards

J. K Soap & chemicals Inds. is using the bin cards in the form of loose sheets to keep the complete records of the receipt and issues of each item of material in terms of quantity as well as balance quality. In the loose sheet each item of stores, minimum level, re-order level, re-order quantity are applied. So by seeing the loose sheet, the store keeper can send the material requisition for the purchase of material in time.

4.2.2 Store ledger

The company is maintaining store ledger to keep the complete record of each item of material purchase, issues and balance in term of quantity as well as in term of value.

4.2.3 ABC Analysis

Selective inventory technique (ABC Analysis) is common for all to control inventories in the store. It classifies the material in the store to three groups so that effective control over the materials can be exercised. But the J. K Soap & Chemicals Inds. Has not classified the material in different groups for control purpose. It is seen that company has given equal attention to high value as well as less value and non critical materials. This attitude leads to increase the holding cost of inventory and investment on inventory.

The reason for not applying ABC Analysis to control the inventory in store may be due to the management is unknown about its advantages. If the company wants to minimize the holding cost of inventory and investment on inventory, the company should use ABC analysis techniques.

4.3 Issuing material

Materials should be issued against materials requisition slip. The pricing of the issues can be determined on the basis of cost price or market price. In case of J. K Soap& Chemicals Inds. Inventory of different stock is valued at cost price.

4.4 Inventory Management Analysis

A) ECONOMIC ORDER QUANTITY

Palm Acid Oil for 2062/63

Annual requirement = 1306000kg

Material cost = 1306000× 28= Rs36568000

Ordering cost

L/C charge	Rs4100
Bank charge	Rs1600
Clerical staff	Rs29000
Transportation cost	Rs105300
Total	Rs140000

Carrying cost

Carrying cost per kg $= \dfrac{686695}{1306000} =$ Rs0.53Per kg

1) Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

Insurance	Rs117000
Storage cost	Rs391695
Spoilage	Rs28000
Interest on capital	Rs150000
Total	Rs686695

A = Annual requirement

O = Ordering cost per order

C= Carrying cost per kg

By fitting above mention data in EOQ formula

$$\text{EOQ} = \sqrt{\frac{2 \times 1306000 \times 140000}{0.53}} = 830639.67 Kg$$

$$No.\,of\,order = \frac{Annual\ requirement}{EOQ}$$

$$= \frac{1306000}{803639.67} = 1.57 \text{ times}$$

i.e. two times in a year.

The above calculation shows that the economic order size should be 830639.67kg where the combination of carrying cost and ordering cost are minimum. So, if the company wants to minimize the inventory cost the company should place an order of 830639.67kg at a time or place two orders in a year.

Palm Acid Oil for 2063/64

Annual requirement = 1903000kg

Material cost = 1903000× 29= Rs55187000

Ordering cost

L/C charge	Rs4250
Bank charge	Rs1650
Clerical staff	Rs30000
Transportation cost	Rs107000
Total	Rs115900

Carrying cost

$$\text{Carrying cost per kg} = \frac{160008}{708500} = Rs0.37per\ kg$$

2) Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

Insurance	Rs119000
Storage cost	Rs400000
Spoilage	Rs28500
Interest on capital	Rs160000
Total	Rs708500

A = Annual requirement

O= Ordering cost per order

C= Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 1903000 \times 155900}{0.37}} = 1091880.80Kg$$

$$No.\,of\ order = \frac{Annual\ requirement}{EOQ}$$

$$= \frac{1903000}{1091880.80} = 1.74\ times$$

i.e. two times in a year.

The above calculation shows that the economic order size should be 1091880.80kg where the combination of carrying cost and ordering cost are minimum. So, if the company wants to minimize the inventory cost the

company should place an order of 1091880.80 kg at a time or place two orders in a year.

Palm Acid Oil for 2064/65

Annual requirement = 2522000kg

Material cost = 2522000× 30= Rs75660000

Ordering cost

L/C charge	Rs4400
Bank charge	Rs1800
Clerical staff	Rs32000
Transportation cost	Rs108000
Total	Rs146200

Carrying cost

Insurance	Rs120000
Storage cost	Rs425000
Spoilage	Rs30700
Interest on capital	Rs170000
Total	Rs745700

Carrying cost per kg $= \dfrac{745700}{2522000} = $ Rs0.30per kg

3) Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

A = Annual requirement

O = Ordering cost per order

C   = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 2522000 \times 146200}{.30}} = 1567835.9 Kg$$

$$No. of\ order = \frac{Annual\ requirement}{EOQ}$$

$$= \frac{2522000}{15678353.9} = 1.6\ times$$

i.e. two times in a year.

The above calculation shows that the economic order size should be 1567835.9 kg where the combination of carrying cost and ordering cost are minimum. So, if the company wants to minimize the inventory cost the company should place an order of 1567835.9 kg at a time or place two orders in a year.

Palm Acid Oil for 2065/66

Annual requirement = 2823000kg

Material cost = $2823000 \times 31 =$ Rs87513000

Ordering cost

L/C charge	Rs4600
Bank charge	Rs1950
Clerical staff	Rs33500
Transportation cost	Rs110000
Total	Rs150050

Carrying cost

Carrying cost per kg $= \dfrac{7680000}{2823000} = \text{Rs}0.27 \text{Per kg}$

Insurance	Rs 122000
Storage Cost	Rs 435000
Spoilage	Rs 31000
Interest on Capital	Rs 180000
Total	Rs 768000

4) Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

A = Annual requirement

O = Ordering cost per order

C = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\dfrac{2 \times 2823000 \times 150050}{0.27}} = 1771358.9 Kg$$

$$No.\,of\,order = \dfrac{Annual\ requirement}{EOQ}$$

$$= \dfrac{2823000}{1771358.9} = 1.59 \text{ times}$$

i.e. two times in a year.

The above calculation shows that the economic order size should be 1771358.9 kg where the combination of carrying cost and ordering cost are minimum . So, if the company wants to minimize the inventory cost the company should place an order of 1771358.9 kg at a time or place two orders in a year.

Palm Acid Oil for 2066/67

Annual requirement = 3221000kg

Material cost = 3221000× 32= Rs103072000

Ordering cost

L/C charge	Rs4700
Bank charge	Rs2000
Clerical staff	Rs34000
Transportation cost	Rs112000
Total	Rs152700

Carrying Cost

Insurance	Rs123000
Storage cost	Rs436000
Spoilage	Rs32000
Interest on capital	Rs185000
Total	Rs776000

Carrying cost per kg = $\dfrac{776000}{3221000}$ = Rs0.24Per kg

5) Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

A = Annual requirement

O = Ordering cost per order

C = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 3221000 \times 776000}{0.24}} = 2235842.6 Kg$$

$$No.\, of\, order = \frac{Annual\, requirement}{EOQ}$$

$$= \frac{3221000}{2235842.6} = 1.44\, times$$

i.e. one time in a year.

The above calculation shows that the economic order size should be 2235842.6 kg where the combination of carrying cost and ordering cost are minimum. So, if the company wants to minimize the inventory cost the company should place an order of 2235842.6 kg at a time or place one order in a year.

2) Calculation of EOQ (Graphic Method)

Figure 4.1

Y   **Graphic Method of EOQ**
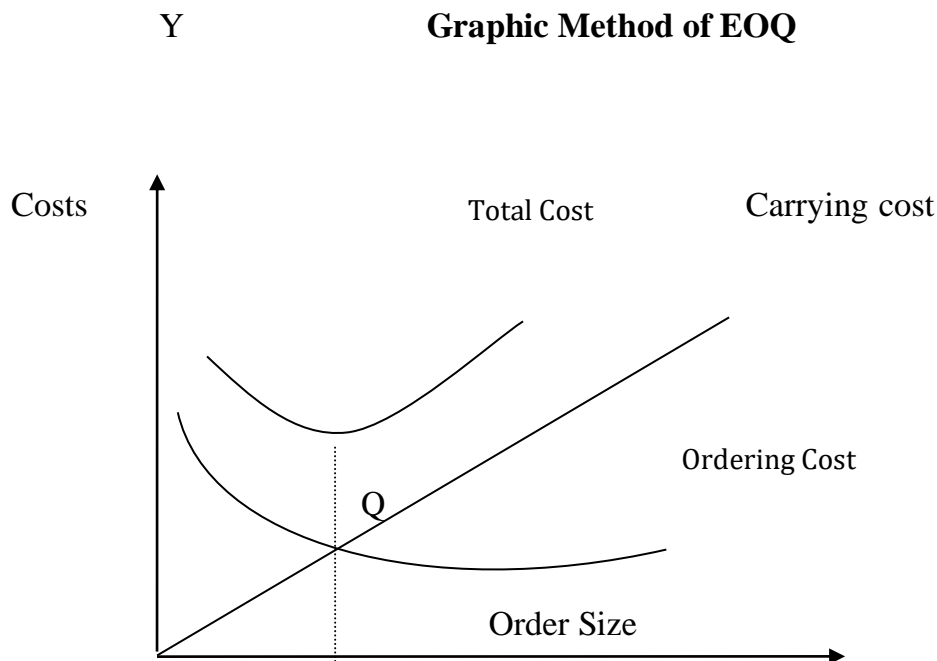
As we know that the total carrying cost increases as the order size increases because on an average a large inventory level will be maintained and ordering cost decreases with increase in order size because the large order size means less number of order. The behavior of total cost differs with order size. The total costs decline in the first stage and then they start rising when the decrease in ordering cost is more than offset by the increase in carrying cost. In figure

carrying cost, ordering cost and total cost are plotted in vertical axis and order size in horizontal axis. The carrying cost line is gradually increases with the increase in order size and ordering cost line gradually decreases with the increase in order size. These two cost lines intersect at a certain point in the figure i.e. Q which is the minimum cost combination of inventory. In this point the total cost of inventory becomes minimum which is the respective order size. If the company increases or decreases the order size, the inventory cost will be higher.

B) REORDER LEVEL

Palm Acid Oil

Maximum usage rate = 5000kg/day

Maximum lead time   = 42 days

Working days   = 250days/year

Calculation of Reorder level (RL):

RL = Maximum usage rate ×maximum lead time

$\quad$ = 5000× 42 = 210000kg

From the above calculation when the level of inventory reaches to 210000kg another new order should be placed. By the use of economic order quantity formula we have calculated the EOQ 945000kg and number of order to be placed 2 times in a year. So the new order for 945000kg palm acid oil should be placed after 125 days of the first order when the level of inventory reaches to 210000kg.

4) Annual requirement and annual purchase of palm acid oil in term of quantity (kg)

Table 4.1

Showing annual requirement and annual purchase of palm acid oil (kg)

Fiscal year	Annual requirement (A)	Annual purchase (AP)	% Change (AP-AR)/AR×100
2062/63	1306000	1505000	15.24
2063/64	1903000	2052000	7.83
2064/65	2522000	2642000	4.76
2065/66	2823000	2942000	4.22
2066/67	3221000	3296000	2.33

(Source: Annual reports)

The above table shows the annual requirement and annual purchase made by the company on different years. Both annual requirement determined by the company and purchase made by the company is increasing and decreasing over the study period. If annual requirement of palm acid oil is compared with actual purchase made by the company, it is observed that the actual purchase always exceed the annual requirement of palm acid oil over the study. In F.Y 2062/63 annual purchase of palm acid oil exceed annual requirement by 15.24%, in 2063/64 it was 7.83%, in 2064/65 it was 4.76%, in 2065/66 it was 4.22% and in 2066/67 it was 2.33%.

A) ECONOMIC ORDER QUANTITY

Palm Fatty Acid Oil for 2062/63

Annual requirement = 430000kg

Material cost = 430000 × 33 = Rs14190000

Ordering cost per order

L/C charge	Rs4000
Bank charge	Rs1500
Clerical staff	Rs28000
Transportation cost	Rs86500
Total	Rs120000

Carrying cost

Insurance	Rs110000
Storage cost	Rs350000
Spoilage	Rs16500
Interest on capital	Rs90000
Total	Rs566500

Carrying cost per kg $= \dfrac{566500}{1090000} =$ Rs0.52 per kg

Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

A　= Annual requirement

O　= Ordering cost per order

C　= Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 1090000 \times 120000}{0.52}} = 683478.5 \text{kg}$$

a) Calculation of no. of order to be placed in a year

No. of order $= \dfrac{\textit{Annual requirement}}{EOQ}$

$$= \frac{1090000}{683478.5} = 1.59 \text{ times}$$

I.e. near about 2 times in a year.

From the above calculation, it shows that the economic order size should be 279610kg where the combination of carrying cost and ordering cost are minimum. So if the company wants to minimize the inventory cost the company should place an order of 279610kg at a time or place two orders in a year.

Palm Fatty Acid Oil for 2063/64

Annual requirement = 788000kg

Material cost =788000× 34= Rs14190000

Ordering cost per order

L/C charge	Rs3600
Bank charge	Rs1100
Clerical staff	Rs23000
Transportation cost	Rs82000
Total	Rs109700

Carrying cost

Insurance	Rs106000
Storage cost	Rs345000
Spoilage	Rs12000
Interest on capital	Rs84000
Total	Rs547000

Carrying cost per kg $= \dfrac{547000}{788000}$ =Rs0.69 per kg

Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

A   = Annual requirement

O   = Ordering cost per order

C   = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\dfrac{2 \times 788000 \times 109700}{0.69}}$$ =500560.84kg

a) Calculation of no. of order to be placed in a year

No. of order $= \dfrac{Annual\ requirement}{EOQ}$

$$= \dfrac{788000}{500560.84} = 1.57\ times$$

.e. near about 2 times in a year.

From the above calculation, it shows that the economic order size should be 500560.84kg where the combination of carrying cost and ordering cost are minimum. So if the company wants to minimize the inventory cost the company should place an order of 500560.84kg at a time or place two orders in a year.

Palm Fatty Acid Oil for 2064/65

Annual requirement = 833000kg

Material cost =833000× 35= Rs29155000

Ordering cost per order

L/C charge	Rs3700
Bank charge	Rs1200
Clerical staff	Rs24000
Transportation cost	Rs8300
Total	Rs111900

Carrying cost

Insurance	Rs107000
Storage cost	Rs346000
Spoilage	Rs13000
Interest on capital	Rs85000
Total	Rs551000

Carrying cost per kg $=\dfrac{551000}{833000}$ =Rs0.66 per kg

Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

R = Annual requirement

O = Ordering cost per order

C = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2\times 833000\times 111900}{0.66}}$$ =531472.23kg

a) Calculation of no. of order to be placed in a year

No. of order $= \dfrac{Annual\ requirement}{EOQ}$

$= \dfrac{833000}{531472.23} = 1.57$ times

I.e. near about 2 times in a year.

From the above calculation, it shows that the economic order size should be 531472.23kg where the combination of carrying cost and ordering cost are minimum. So if the company wants to minimize the inventory cost the company should place an order of 531472.23kg at a time or place two orders in a year.

Palm Fatty Acid Oil for 2065/66

Annual requirement = 931000kg

Material cost = 931000× 36= Rs33516000

Ordering cost per order

L/C charge	Rs3800
Bank charge	Rs1300
Clerical staff	Rs25000
Transportation cost	Rs864000
Total	Rs114100

Carrying cost

Insurance	Rs108000
Storage cost	Rs347000
Spoilage	Rs14000
Interest on capital	Rs86000
Total	Rs555000

Carrying cost per kg $= \dfrac{555000}{931000}$ =Rs0.60 per kg

Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

A = Annual requirement

O = Ordering cost per order

C = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 931000 \times 114100}{0.6}} = 595054.9 kg$$

a) Calculation of no. of order to be placed in a year

$$No. \text{ of order} = \frac{Annual\ requirement}{EOQ}$$

$$= \frac{931000}{595054.9} = 1.56 \text{ times}$$

I.e. near about 2 times in a year.

From the above calculation, it shows that the economic order size should be 595054.9kg where the combination of carrying cost and ordering cost are minimum. So if the company wants to minimize the inventory cost the company should place an order of 595054.9kg at a time or place two orders in a year.

Palm Fatty Acid Oil for 2066/67

Annual requirement = 971000kg

Material cost = 430000 × 37 = Rs14190000

Ordering cost per order

L/C charge	Rs3900
Bank charge	Rs1400
Clerical staff	Rs25000
Transportation cost	Rs85500
Total	Rs150900

Carrying cost

Insurance	Rs109000
Storage cost	Rs348500
Spoilage	Rs15000
Interest on capital	Rs88000
Total	Rs360500

Carrying cost per kg $= \dfrac{360500}{971000}$ =Rs0.37 per kg

Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic order quantity

R = Annual requirement

O = Ordering cost per order

C = Carrying cost per kg

By fitting above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 971000 \times 150900}{0.37}} = 889955.66 kg$$

a) Calculation of no. of order to be placed in a year

No. of order $= \dfrac{Annual\ requirement}{EOQ}$

$$= \frac{971000}{889955.66} = 1.09 \text{ times}$$

I.e. near about 2 times in a year.

From the above calculation, it shows that the economic order size should be 889955.66kg where the combination of carrying cost and ordering cost are minimum. So if the company wants to minimize the inventory cost the company should place an order of 889955.66kg at a time or place two orders in a year.

B) REORDER LEVEL

Palm Fatty Acid Oil

Maximum usage rate = 2150/ day

Maximum lead time   = 30 days

Working days   = 250 days/ year

Calculation of Reorder Level (RL):

RL = Maximum usage rate × maximum lead time

$\quad$ = 2150 × 30 = 64500kg

From the above calculation when the level of inventory reaches to 64500kg another new order should be placed. By the use of EOQ table we have calculated the EOQ 215000kg and no of order to be placed 2 times in a year. So the new order for 215000kg palm fatty acid oil should be placed after 125 days of the first order when the level of inventory reaches to 64500kg.

Annual requirement and annual purchase of palm fatty acid oil in term of quantity (kg)

Table 4.2

Showing annual requirement and annual purchase of palm fatty acid oil (kg)

Fiscal year	Annualrequirement (AR)	Annualpurchase (AP)	% Change (AP-AR)/AR×100
2062/63	1090000	1199000	10
2063/64	788000	948900	20.42
2064/65	833000	952400	14.33
2065/66	931000	1045000	12.24
2066/67	971000	1097000	12.98

(Source: Annual reports)

The above table 4.4 shows the annual requirement and annual purchase made by the company on different fiscal years. Both annual requirement determined by the company and purchase made by the company is increasing and decreasing over the study period. If annual requirement of palm fatty acid oil is compared with actual purchase made by the company, it is observed that the actual purchase always exceeded the annual requirement of palm fatty acid oil over the study. In F.Y 2062/63 annual purchase of palm fatty acid oil exceeded by 10%, in 2063/64 it was 20.42%, in 2064/65 it was 14.33%, in 2065/66 it was 12.24% and in 2066/67 it was 12.98%.

A) ECONOMIC ORDER QUANTITY

Caustic soda for 2062/63

Annual requirement = 498000kg

Material cost (Qty× price) = 498000×31.06 = Rs6151200

Ordering cost

L/C charge	Rs4025
Bank charge	Rs1575
Clerical staff	Rs28750
Transportation cost	Rs95650
Total	Rs130000

Carrying cost

Insurance	Rs114000
Storage cost	Rs310600
Spoilage	Rs390000
Interest on capital	Rs100000
Total	Rs6350600

Carrying cost per kg $= \dfrac{563600}{498000} =$ **Rs1.13 kg**

1. Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic Order Quantity

A = Annual requirement

O = Ordering cost / order

C = Carrying cost / kg

By fitting the above mention data in EOQ formula

EOQ $= \sqrt{\dfrac{2 \times 498000 \times 130000}{1.13}} =$ **338502.69kg**

a) Calculation of no. of order to be placed in a year

No. of order $= \dfrac{Annual\ requirement}{EOQ}$

$= \dfrac{498000}{338502.69} = 1.47$ times

i.e. near about 2 times in a year.

The above calculation shows that the economic quantity should be 319300kg where combination of carrying cost and ordering cost are minimum. So if the company needs to minimize the inventory cost the company should place an order of 319300kg at a time or place two order in a year.

Caustic soda for 2063/64

Annual requirement = 560000kg

Material cost (Qty× price) = 560000×32 = Rs6151200

Ordering cost

L/C charge	Rs5000
Bank charge	Rs1650
Clerical staff	Rs35000
Transportation cost	Rs96500
Total	Rs133150

Carrying cost

Insurance	Rs117000
Storage cost	Rs325000
Spoilage	Rs42000
Interest on capital	Rs120000
Total	Rs604000

Carrying cost per kg $= \dfrac{604000}{560000}$ = Rs1.08 kg

1. Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic Order Quantity

A   = Annual requirement

O   = Ordering cost / order

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C   = Carrying cost / kg

By fitting the above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 560000 \times 133150}{1.08}} = 371593.17 \text{ kg}$$

a) Calculation of no. of order to be placed in a year

$$\text{No. of order} = \frac{Annual\ requirement}{EOQ}$$

$$= \frac{560000}{371593.17} = 1.50 \text{ times}$$

i.e. near about 2 times in a year.

The above calculation shows that the economic quantity should be 371593.17 kg where combination of carrying cost and ordering cost are minimum. So if the company needs to minimize the inventory cost the company should place an order of 371593.17 kg at a time or place two order in a year.

Caustic soda for 2064/65

Annual requirement = 492000kg

Material cost (Qty× price) = 492000×31.06 = Rs6151200

Ordering cost

L/C charge	Rs4000
Bank charge	Rs1520
Clerical staff	Rs28500
Transportation cost	Rs29000
Total	Rs129020

Carrying cost

Insurance	Rs113500
Storage cost	Rs310000
Spoilage	Rs15000
Interest on capital	Rs98500
Total	Rs557000

Carrying cost per kg $= \dfrac{557000}{492000} = $ Rs1.13 kg

1. Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic Order Quantity

A = Annual requirement

O = Ordering cost / order

C = Carrying cost / kg

By fitting the above mention data in EOQ formula

$$EOQ = \sqrt{\dfrac{2 \times 492000 \times 1290250}{1.13}} = 335186.75 \text{ kg}$$

a) Calculation of no. of order to be placed in a year

$$\text{No. of order} = \dfrac{Annual\ requirement}{EOQ}$$

$$= \dfrac{492000}{335186.75} = 1.47 \text{ times}$$

i.e. near about 2 times in a year.

The above calculation shows that the economic quantity should be 335186.75 kg where combination of carrying cost and ordering cost are minimum. So if the company needs to minimize the inventory cost the company should place an order of 335186.75 kg at a time or place two order in a year.

Caustic soda for 2065/66

Annual requirement = 537500kg

Material cost (Qty× price) = 537500×33 = Rs6151200

Ordering cost

L/C charge	Rs4700
Bank charge	Rs1600
Clerical staff	Rs29500
Transportation cost	Rs9600
Total	Rs131800

Carrying cost

Insurance	Rs116000
Storage cost	Rs320000
Spoilage	Rs41000
Interest on capital	Rs115000
Total	Rs592000

Carrying cost per kg = $\dfrac{592000}{537500}$ = Rs1.10 kg

1. Calculation of EOQ (Formula method)

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

Where,

EOQ = Economic Order Quantity

A   = Annual requirement

O   = Ordering cost / order

C   = Carrying cost / kg

By fitting the above mention data in EOQ formula

$$EOQ = \sqrt{\dfrac{2 \times 537500 \times 131800}{1.1}} = 358893.50 \text{ kg}$$

a) Calculation of no. of order to be placed in a year

No. of order = $\dfrac{Annual\ requirement}{EOQ}$

$= \dfrac{537500}{358893.5} = 1.50$ times

i.e. near about 2 times in a year.

The above calculation shows that the economic quantity should be 358893.50 kg where combination of carrying cost and ordering cost are minimum. So if the company needs to minimize the inventory cost the company should place an order of 358893.50 kg at a time or place two order in a year.

Caustic soda for 2066/67

Annual requirement = 533000kg

Material cost (Qty× price) = 533000×34 = Rs6151200

Ordering cost

L/C charge	Rs4500
Bank charge	Rs1580
Clerical staff	Rs29000
Transportation cost	Rs95500
Total	Rs130580

Carrying cost

Insurance	Rs114000
Storage cost	Rs315000
Spoilage	Rs49000
Interest on capital	Rs110000
Total	Rs588000

Carrying cost per kg $= \dfrac{588000}{533000} = $ Rs1.10 kg

1. Calculation of EOQ (Formula method)

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

Where,

$\qquad$ EOQ = Economic Order Quantity

$\qquad$ A $\quad$ = Annual requirement

$\qquad$ O $\quad$ = Ordering cost / order

$\qquad$ C $\quad$ = Carrying cost / kg

By fitting the above mention data in EOQ formula

$$EOQ = \sqrt{\frac{2 \times 533000 \times 130580}{1.1}} = 332895.89 \text{ kg}$$

a) Calculation of no. of order to be placed in a year

No. of order $= \dfrac{Annual\ requirement}{EOQ}$

$$= \frac{533000}{355730} = 1.50 \text{ times}$$

i.e. near about 2 times in a year.

The above calculation shows that the economic quantity should be 332895.89 kg where combination of carrying cost and ordering cost are minimum. So if the company needs to minimize the inventory cost the company should place an order of 332895.89 kg at a time or place two order in a year.

B) REORDER LEVEL

Caustic soda

Maximum usage rate = 2600kg/day

Maximum lead time $\quad$ = 36 days

Working days $\qquad$ = 250 days / year

Calculation of Reorder Level (RL):

RL = Maximum usage rate × maximum lead time

   = 2600 × 36 = 93600kg

From the above calculation it is found that when the level of inventory reaches to 93600kg, another new order should be placed. By the use of EOQ table we have computed EOQ 260000kg and no. of order to be placed 2 times in a year. So the new order for 260000kg caustic soda should be placed after 125 days of the first order when the level of inventory reaches to 93600kg.

Annual requirement and annual purchase of caustic soda in term of quantity (kg)

Table 4.3

Showing annual requirement and annual purchase of caustic soda (kg)

Fiscal year	Annual equirement (AR)	Annual purchase (AP)	% Change (AP-AR)/AR×100
2062/63	498000	530450	6.52
2063/64	560000	600000	7.14
2064/65	492000	592000	20.33
2065/66	537500	600000	11.63
2066/67	533000	565450	6.09

(Source: Annual Reports)

The above table 4.6 shows the annual requirement and annual purchase made by the company on different fiscal years. Both annual requirement and determined by the company and purchase made by the company is increasing and decreasing over the study period. If annual requirement of caustic soda is compared with actual purchase made by the company it is observed that the actual purchase always exceeds the annual requirement over the study. In F.Y 2062/63 annual purchase of caustic soda exceeded annual requirement by 6.52%, in 2063/64 it was 7.14%, in 2064/65 it was 20.33%, in 2065/66 it was 11.63% and in 2066/67 it was 6.09.

4.5 Trend Analysis

Trend analysis was made in order to analyze the growth rate of various aspects of related to inventory management. This was basically done with the help of past data and used to forecast the future. Different aspects of inventory management for which trend analysis were made as presented below.

4.5.1 Trend analysis of purchase

Purchase is the process of acquiring something necessary to run the company. Purchase includes the acquisition of essential inputs as well as other stationeries and goods for the efficient functioning of management. This also includes the acquisition 22of spares and parts of plants.

Table 4.4

Trend analysis of purchase

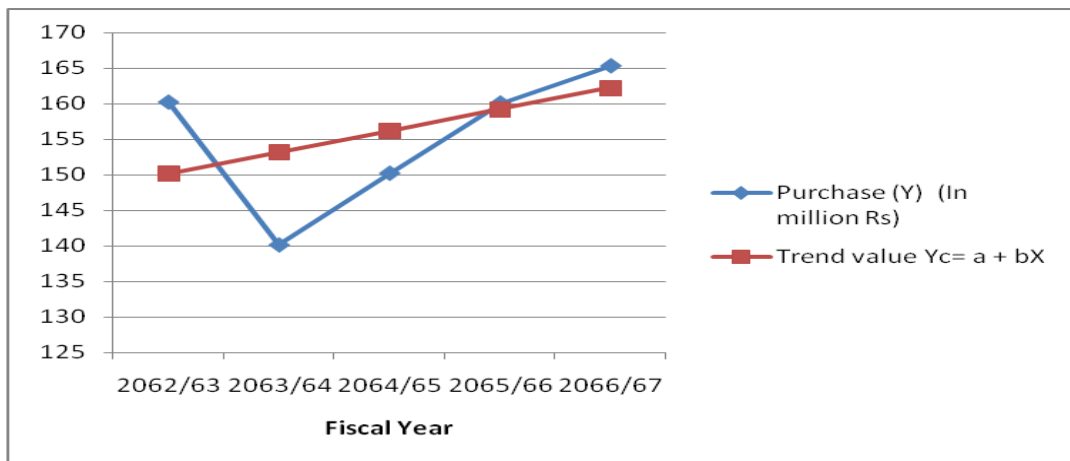| Fiscal year	T	X(T-3)	X^2	Purchase (Y) (in million Rs)	XY	Trend value $Y_c = a + bX$	Impact
2062/63	1	-2	4	160.23	-320.46	150.174	N
2063/64	2	-1	1	140.14	-140.14	153.19	P
2064/65	3	0	0	150.23	0	156.21	P
2065/66	4	1	1	160.10	160.10	159.23	N
2066/67	5	2	4	165.34	330.68	162.25	N
		ΣX=0	ΣX=10	**ΣY=781.04**	ΣXY=30.18		

(Source: Annual Reports)

Where,

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

$$b = \frac{\sum XY}{\sum X^2}$$

Figure 4.2

Trend analysis of Actual purchase

(Source: Table VIII)

Trend values for the study period show the steady increase of actual purchase throughout the period. But actual value of purchase was deviated from the trend value. Interestingly trend value and actual values were closer for each year.

Trend analysis of sales

Ultimate goal of any manufacturing industry is to produce the product and make it available in market for sale. Thus, sales are always associated with the manufacturing industries, which ensure the inflow of money to industry

Table 4.5

Trend analysis of sales

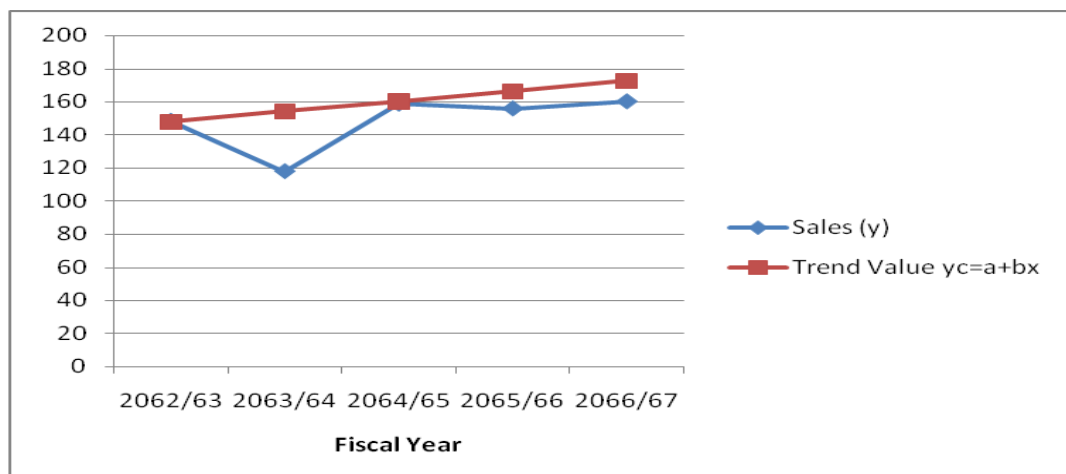| Fiscal year	T	X(T-3)	X^2	Sales (y) (in million Rs.)	Xy	Trend Value yc=a+bx	Impact
2062/63	1	-2	4	148.39	-296.78	147.86	N
2063/64	2	-1	1	117.78	-117.78	154.03	P
2064/65	3	0	0	158.80	0	160.21	P
2065/66	4	1	1	155.88	155.88	166.39	P
2066/67	5	2	4	160.22	320.44	172.56	P
		$\sum x = 0$	$\sum x = 10$	$\sum y = 801.07$	$\sum xy = 61.76$		

(Source: Annual Reports)

$$a = \frac{\sum y}{n} = \frac{801.07}{5} = 160.21$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{61.76}{10} = 6.176 \, \mathbf{s}$$

Figure 4.3

Trend analysis of sales

(Source: Table IX)

The table 4.7 and figure 4.3 shows the picture of actual sales and trend value of sales. Sales were also increasing at steady rate during the steady period. It had increased from 135.56 for the year 2062/63 to 160.72 for the year 2066/67. However the actual value remained above trend value for the year of 2062/63, 2064/65 and 2065/66. Besides this for the year 2063/64 and 2066/67 actual value lied below trend value.

4.5.2 Trend analysis of purchase of raw material Raw material is the fundamental and basic requirement for any processing industry to run it smoothly. Even though the seven years data shown the declining trend in purchase of raw material, rise and fall in purchase was observed for given period.

Table 4.6
Trend analysis of purchase of raw material

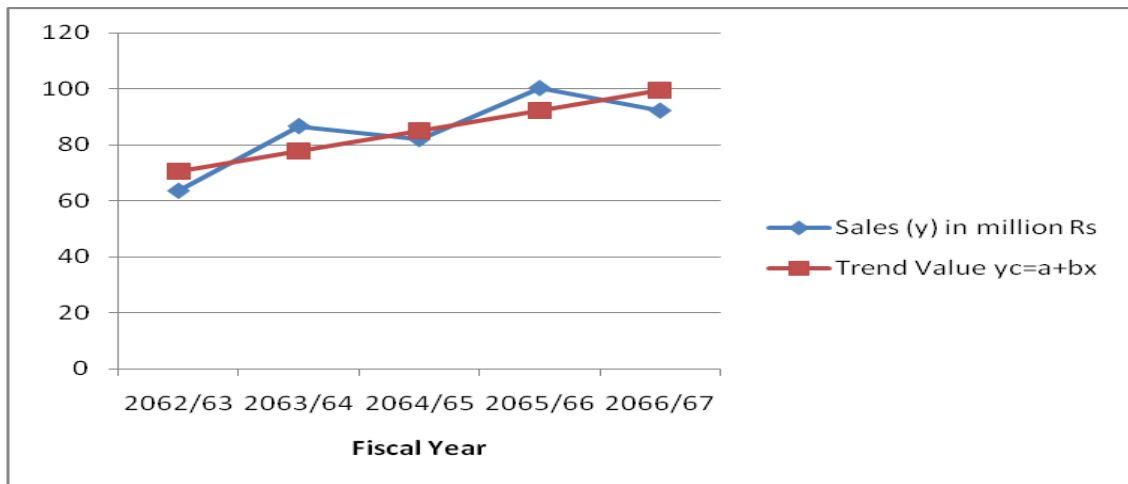| Fiscal year	T	X(T-3)	X^2	Sales (y) (in million Rs.)	Xy	Trend Value yc=a+bx	Impact
2062/63	1	-2	4	63.77	-127.54	70.42	P
2063/64	2	-1	1	86.66	-86.66	77.69	N
2064/65	3	0	0	82.07	0	84.96	P
2065/66	4	1	1	100.15	10.15	92.23	N
2066/67	5	2	4	92.16	184.32	99.5	P
		$\sum x = 0$	$\sum x = 10$	$\sum y = 424.81$	$\sum xy = 70.27$		

(Source: Annual reports)

$$a = \frac{\sum y}{n} = \frac{232.5}{5} = 46.56$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{70.27}{10} = 7.027 \text{ s}$$

81

Figure 4.4

Trend analysis of purchase of raw material

(Source: Table X)

The table 4.8 and figure 4.4 shows the trend value and actual value of raw material purchase for the study period. The actual value remained above trend value for the year 2063/64, and 2065/66 but for the year, 2062/63, 2064/65 and 2066/67 actual value remained below trend value.

4.5.3 Trend analysis of inventory

Inventory is all the possession of industry. Inventory constitutes the important part of current assets. Thus, the shortage of required inventory may result into irregular production, high manufacturing cost, and unfavorable labor variation. Therefore, the inventory must be in optimum position.
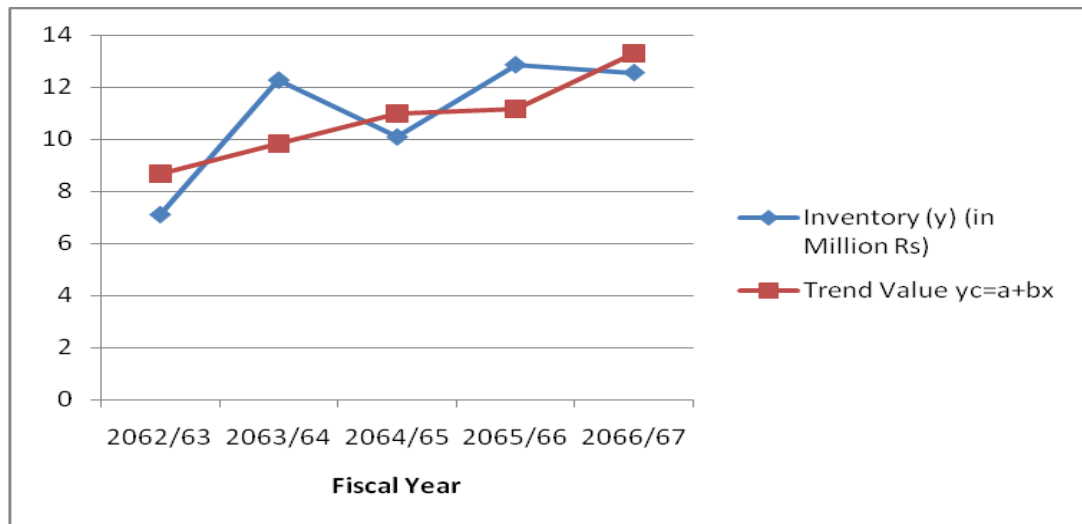
Table 4.7

Trend analysis of inventory

Fiscal year	T	X(T-3)	X^2	Inventory (y) (in million Rs.)	Xy	Trend Value yc=a+bx	Impact
2062/63	1	-2	4	7.10	-14.20	8.67	P
2063/64	2	-1	1	12.28	-12.28	9.83	N
2064/65	3	0	0	10.09	0	10.98	P
2065/66	4	1	1	12.87	12.87	11.15	N
2066/67	5	2	4	12.57	25.14	13.29	P
		$\sum x = 0$	$\sum x = 10$	$\sum y = 54.91$	$\sum xy = 11.54$		

(Source: Annual reports)

$$a= \frac{\sum y}{n} = \frac{54.91}{5} = 10.98$$

$$b= \frac{\sum xy}{\sum x^2} = \frac{11.54}{10} = 1.154 \text{ s}$$

Figure 4.5

Trend analysis of inventory

(Source: Table XI)

The table 4.9 and figure 4.5 shows the trend value and actual value of inventory for the study period. Inventory of J. K soap had been increased from 7.10 million during 2062/63 to 12.57 during 2066/67 signifying the increasing trend.

4.5.4 Trend analysis of work in process

Work in process simply constitutes the product at various stages of processing before it became the finished goods. It serves as an indicator for need of capital for inventory.
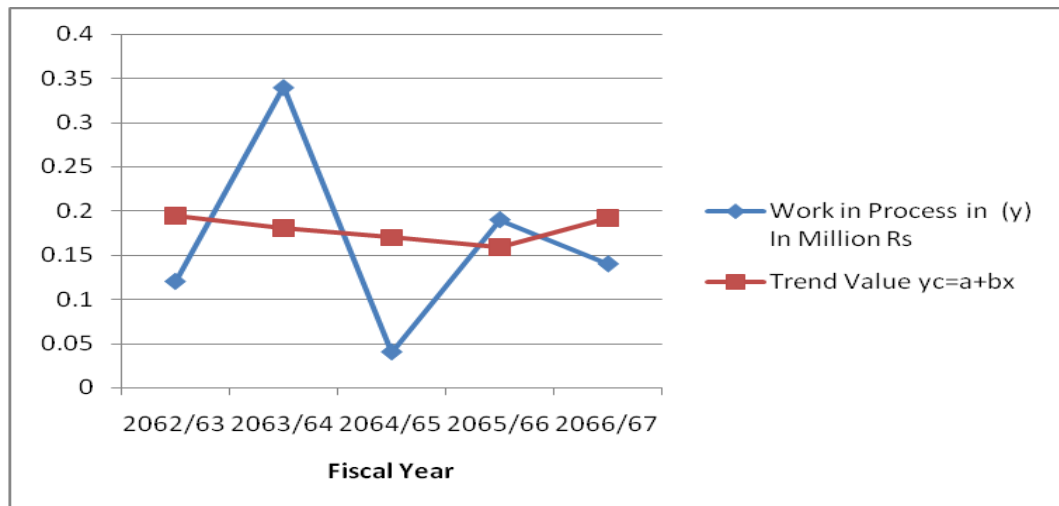
Table 4.8

Trend analysis of work in process

Fiscal year	T	X(T-3)	X^2	Work in Process in (y) (in million Rs.)	Xy	Trend Value yc=a+bx	Impact
2062/63	1	-2	4	0.12	-0.24	0.195	P
2063/64	2	-1	1	0.34	-0.34	0.181	N
2064/65	3	0	0	0.04	0	0.17	P
2065/66	4	1	1	0.19	0.19	0.159	N
2066/67	5	2	4	0.14	0.28	0.192	P
		$\sum x = 0$	$\sum x = 10$	$\sum y = 0.83$	$\sum xy = -0.11$		

(Source: Annual reports)

$$a = \frac{\sum y}{n} = \frac{0.83}{5} = 0.17$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{-0.11}{10} = -0.011$$

Figure 4.6

Trend analysis of work in process

(Source: Table XII)

The table 4.10 and figure 4.6 gives the picture of actual work in process and its trend value. There is slightly increase and decrease in work in process for the given period of 2062/63 to 2066/67. However, fluctuation was observed during the period.

4.5.5 Trend analysis of finished goods

Trend analysis of finished goods reflects the trend of production of the company. The actual value of finished goods was found increasing for the year 2062/63, 2063/64, 2066/67 and decreasing for the year 2064/65 and 2065/66 (Table 4.11 and Figure 4.7).

Table 4.9

Trend analysis of finished goods

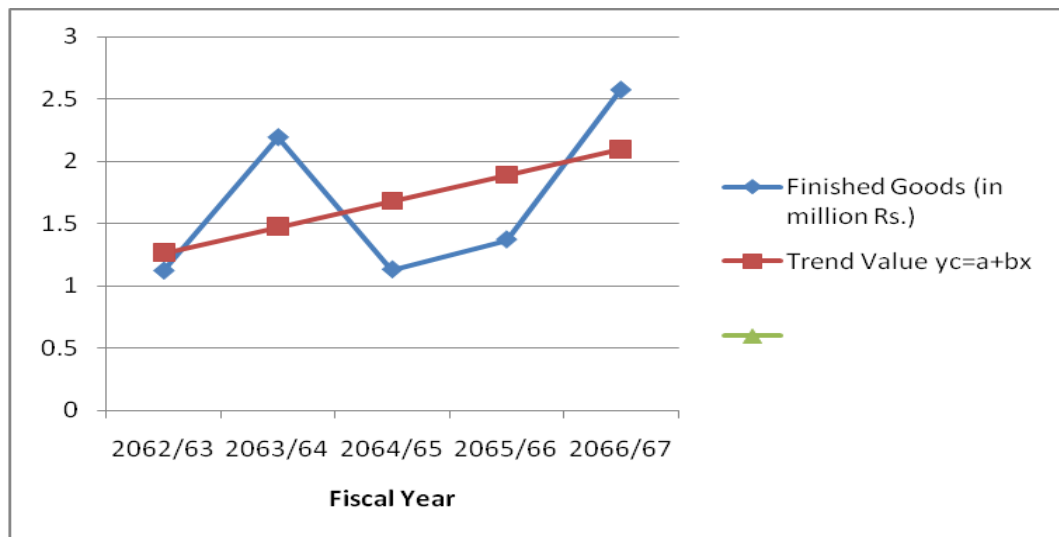| Fiscal year	T	X(T-3)	X^2	Finished Goods (y) (in million Rs.)	Xy	Trend Value yc=a+bx	Impact
2062/63	1	-2	4	1.12	-2.24	1.262	P
2063/64	2	-1	1	2.19	-2.19	1.472	N
2064/65	3	0	0	1.13	0	1.68	P
2065/66	4	1	1	1.37	1.37	1.89	p
2066/67	5	2	4	2.57	5.14	2.096	N
		$\sum x = 0$	$\sum x = 10$	$\sum y = 8.38$	$\sum xy = 2.08$		

(*Source: Annual reports*)

$$a = \frac{\sum y}{n} = \frac{8.38}{5} = 1.68$$

$$b = \frac{\sum xy}{\sum x^2} = \frac{2.08}{10} = 0.208$$

Figure 4.7

Trend analysis of finished goods

(Source: Table 4.13)

4.6 Major findings

On the basis of data presentation and their financial and statistical analysis of J.K soap & chemicals Inds. Pvt. Ltd, the major findings related to this study are given below:

- E.O.Q for palm Acid oil is 1212435.57k.g and no. of order for palm Acid oil is 1.56 time.

- In F.Y 2062/63 annual purchase of palm acid oil exceed annual requirement by 15.24%, in 2063/64 it was 7.83%, in 2064/65 it was 4.76%, in 2065/66 it was 4.22% and in 2066/67 it was 2.33%.

- In F.Y 2062/63 annual purchase of palm fatty acid oil exceeded by 10%, in 2063/64 it was 20.42%, in 2064/65 it was 14.33%, in 2065/66 it was 12.24% and in 2066/67 it was 12.98%.

- In F.Y 2062/63 annual purchase of caustic soda exceeded annual requirement by 6.52%, in 2063/64 it was 7.14%, in 2064/65 it was 20.33%, in 2065/66 it was 11.63% and in 2066/67 it was 6.09.

- Required raw materials are for the production of different types soaps are imported from foreign countries like Malaysia, China, Australia and India.

- Letter of credit is used to import raw materials from foreign countries.

- The store control device adopted by J. K Soap is Bin card and store ledger. The company has not applied ABC analysis techniques to control various types of inventory in the store.

- The company has not determined the Re-order level, maximum stock level and minimum stock level.

- There is not cost classification system so there is difficult to determine the ordering and carrying cost.

- The company has not followed scientific inventory management technique i.e. Economic Order Quantity model for purchasing different types of raw material.

- The company has purchased more raw material than the requirement.

- The investment on inventory of J. K Soap is very large and the value of inventory is increasing year to year as compared to the production and sales.

- The company's purchase position for different types of raw materials is highly differing from year to year.

- The average actual inventory cost is higher than that of the economic inventory cost. Thus the company should make economic order size to minimize the inventory cost.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The basic objective of the study is to examine the management of inventory in J. K Soap Inds. To fulfill the objective as described, appropriate research methodology has developed. It consists the research design, population and sample, nature and method of analysis. In order to carry out the study data have been basically collected from secondary sources such as annual report, official report and financial statement provided by J. K Soap Inds. Most of manufacturing and trading companies invest a huge amount of money in the form of inventory. J.K Soap Inds. is being the manufacturing company invests huge amount of capital in form of inventory and cost of carrying inventory is higher out of total inventory cost. The cost of inventory directly affects the cost of production and profitability of company. It means slight reduction in cost of inventory decreases the production cost and ultimately increases the profitably at remarkable rate. For this, the efficient management of inventory is desirable.

The efficient management of inventory takes vital role. So this study is concerned with in what extent the company is applying the inventory management techniques to minimize the cost of inventory, which directly affect the price of product. The Secondary data is also collected from direct interview with concerned staffs of the company to find out the problem of company and then the collected data are tabulated and presented as the stated methodology. Then the analysis has been made using the descriptive analysis of inventory management and others analytical tools Summary based on the major findings are as follows:

- Here the main objective of the study is to analyze the inventory practices and to analyze the inventory management system followed by J. K Soap.

- To make this study, the related literatures have been reviewed This study is based on the inventory management of J. K Soap & Chemicals Inds. Pvt. Ltd.

- It is done with a view of solving the problem arises on achieving the objectives of the J. K Soap.. Review of literature gives the concept of inventory management and frameworks from various books, journals and articles.

- This study covers only seven years of financial data i.e. from 2062/63 to 2066/67. It is also used the various inventory tools to analyze the available data.

- Inventory management analysis is done by the analysis of AR and AP. The company has poor estimation of AR. So the company should make the purchase budget.

- The company does not purchase the raw material based on the economic order quantity. So if company wants to minimize the inventory cost the company should use EOQ model.

- To find out the future trend, the trend analysis of purchase, sales, purchase of raw material, inventory, work in process and finished goods has been done.

5.2 Conclusion

The growing number of corporations in Nepal is facing problems of inventory. Due to lack of proper inventory policies, there are many corporations where large amount of capital has been blocked up and very little measures have been taken to manage the inventories on the basis of inventory decision models and techniques that have so far developed. It supplies the quality product at right time in a reasonable price. To earn profit it is necessary to run the company

efficiently, economically and profitably. To ensure this situation in J. K Soap Inds. J. K. Soap & Chemicals Inds. Pvt. Ltd. is a manufacturing company which was established on 24thFalgun 2054 under Company Act 2049. The main objective of this study is analyzing the inventory management practices of J.K Soap Inds. and problem faced by this company in the management of inventory. For the purpose of this study the data and the necessary information were collected from the records and annual reports provided by the company. Conclusion s based on the major findings is as follows:

- J. K Soap & Chemicals Inds. has applied only bin cards and store ledger as the inventory control techniques but not applied the ABC analysis.

- The company does not classify the inventory cost into carrying cost and ordering cost. The company does not follow the economic purchase order so the total cost of carrying and ordering inventory is higher.

- By the analysis, actual inventory cost is greater than the economic order size of inventory cost.

- By the overall analysis it can be concluded that J. K Soap Inds. Pvt. Ltd. should maintain the economic order size which helps to minimize the inventory cost and to increase the profit of the company.

- The selective inventory model (ABC analysis) should be applied by the company for the control of the inventories in the store. ABC analysis divides the inventory into three groups i.e. ABC according to their usage values helps to apply proper control for different group of inventory, minimize the investment of inventory and minimize the cost of storage.

- Lower investment on inventories in relation to total assets may create immediate crisis in the side of production in short duration unfavorable circumstances. Therefore it is necessary to maintain the adequate level of investment on inventories.

5.3 Recommendation

By analyzing the available data, some findings were extracted. Based on the major findings it may be appropriate to make some suggestions and

recommendation for proper management of inventory in J.K Soap Inds. Some of the recommendations based on the major findings are as follows:

- In purchasing procedure, purchase manager should maintain all the necessary records keeping in mind the most important objectives of the purchase department i.e. purchasing right quantity and quality of material at the cheapest rate at proper time to help smooth running of the production functions.

- Production plan should be prepared for different types of soaps with proper co-ordination and co-operation among the planning, sales, marketing department to avoid the excessive investment in the production goods.

- Purchase plan should be prepared for different types of raw materials by seeing production plan and with the proper co-operation and co-ordination among purchasing, storing, marketing, sales and other concern departments to avoid the huge investment in the raw materials.

- Once material received by the store, it is issued by the concerned department as per the quantity demanded in the requisition from previously provided to the store department.

- The scientific management technique should be applied by the company for purchasing different types of raw material so as to maintain optimum level of inventory and to minimize the total inventory cost.

- Re-order, maximum level and minimum level for each types of materials should be maintained by the company to avoid the over stocking of materials.

- For the timely supply of inventory items, reliable supplier should be selected and J. K Soap Inds. Should do appropriate action to them who does not follow the term and condition as stated in the contract.

- The recruitment and selection procedures of efficient personnel for handling inventory should be unbiased and then the company will be able to the efficient and skilled technician and also the company can provide the training on inventory management.

- The top level management should be strict in the management of the inventory and should visit stores frequently.