CHAPTR ONE
INTRODUCTION

1.1 Background of the Study

Nepal is a landlocked country. Beside this it is the country of Himalayas and mountains. The development of economy of the country mostly depends upon the development of agro industry and partly on other industries and business. Inventory is the balance materials of trading houses. Inventory can be either raw materials or finished good ready for sale, or goods in the manufacturing process. So the inventory is recorded as an asset on a company. When the goods are purchased by the Trading houses they have to be stored until they are supplied to the market. Thus, inventory involves higher amount of investment blocking the huge amount of capital. Thus inventory management and control system should be the top priority of every management of the trading houses to reduce the cost of store. So, high inventory is not a good sign because it involves a high cost with storage of the extra inventory of the trading houses.

Modern concept of inventory management can be traced from 1915-1922 with several authors like Davis, Clark, Owen. They had develop an economic lot size equation which has minimize sum of holding cost and carrying cost where the demand is known and constant. Inventory makes a link between demand of the goods and supply of the goods. The inventory exists in manufacturing and non manufacturing organization also. But, mostly the inventories are appearing in manufacturing and trading houses. There are four types of inventories in the manufacturing organization. First one is raw material purchased and stored for future production. Second is work-in-process refers to semi-manufactured products; they represent those products that need more work before they become finished product for sale. Third is a finished goods inventories completely manufactured products and ready for sale and fourth is office and plant cleaning materials (Soap, brooms, oil, fuels, bulbs etc). But in the case of trading houses there finished goods as stock-in-trade. Inventory management involves planning of the optimal level of inventory and control of inventory cost. It involves both financial dimension as well as physical dimension and these dimensions are interrelated and can't be looked in isolation.

Inventory should be maintained in appropriate quantity so as to avoid the risk of both over and under stock situation. Level of inventory is a portion of current assets, which directly affect the outflow of cash. It may cause the scarcity as well as maximum liquidity level of

cash in the organization. For this purpose, the inventory management is necessary; it is because the aim of optimum level of inventory is maintained for the smooth supply to the market and sales operation and to minimize the total cost of investment that will lead to optimal inventory investment for attainment of desired objectives. The growing number of business corporations in Nepal faces a lot of problem in inventory management. Due to lack of proper inventory policy and system, there are many organizations where large amount of capital are blocked up and very little measures have been taken to manage the inventory. The area of inventory management covers the following phases: determine the size of inventory with time schedule, procedure and lot sizes for new order, determine minimum safety stock level and co-ordinate the sales department for inventory policy such that proper store facility, arrange the receipt, disbursement and procurement of goods are in operation. Inventory management covers the development of recording the transaction, assign the responsibility for carrying out the inventory control function and provide the necessary report for reviewing overall activities of top management.

1.2 Introduction Of The Organization

Salt Trading Corporation Limited (STC) was established in 1963 A.D. through the joint efforts of the HMG/Nepal and the private sector to ensure proper supply and distribution of essential consumer items throughout the country. Its first task was to make edible salt readily available. The salt trade in those days was disordered and unreliable. Later it dealt with essential commodities such as sugar, food grains and processed eatables into its distribution network.

STC has equity in many pioneering and leading industries in the Kingdom such as Khadya Udyog Limited, Nepal Vegetable Ghee Udyog Limited, Butwal Spinning Mills Limited, Gorakhkali Rubber Udyog Limited, Morang Sugar Mills Limited and Gharelu Hastakala Udyog Pvt. Limited. Forty years of dedication and service to the nation has today made Salt Trading Corporation Limited a major catalyst in bringing about the desired economic changes and growth in Nepal. Main commitment of the STC is to maintaining high quality, reasonable price, easily available system in the Kingdom throughout the year and preventing the dealings of the goods affecting public health is the characteristics and commitment of Salt Trading Corporation.

The organization began its trading activities by dealing in salt and now imports, exports, produces and supplies goods of vast diversities. Industrial products, agricultural products and industrial raw materials are the major components of its trade. With the introduction of the liberal economic policy the organization is committed to boosting exports to bring about a more favorable change in the balance of trade. The organization also conducts triangular trade

dedicated to the task of promoting more exports for the benefit of exporters and importers alike.

1.3 Statement of the Problem

Inventory directly affects profitability of an organization. Managing inventory in a proper way is a great challenge to every organization. In Nepal, trading houses are given scope to build the infrastructure to stock the goods and supply consumer goods in partnership with the private as well as public sector. They are also expected to generate revenue and contribute the national economy through their operation. STC was established more than four decade ago through the joint efforts of the then Nepal Government and private sector. Its aim is to supply the essential consumer goods throughout the country. Its first task was to make edible salt readily available for all at reasonable price. It has also contributed capital to the national treasury. It also dealt with essential commodities such as sugar, food grains and processed eatables into its distribution network throughout the country. Sales determine the purchase and level of inventory. In the context of STC, sale increased unsatisfactorily and changed in inventory was more fluctuating. Excess and inadequate inventory would increase the cost and decreased the profit spontaneously. However, the inventory position of the corporation is increasing from the fiscal year 2063/2064.

1.4 Objectives of the Study

The major objectives of the study are:

a) To analyze the condition of Inventory management and its relationship with other variables like net sales, net profit, purchases.

b) To show the effects of inventory in cash flow of STC.

1.5 Significance of the Study

One of the most important tasks of the Trading houses is Inventory management. If inventory of the organization is not effectively and efficiently managed the organization can't achieve their pre-determined goal. Proper management of the inventory helps to maximize the profitability. This study attempted to see the impact of inventory on profitability of STC and find out investment to be made in inventory. What is the present situation of inventory management system of STC and how the level of inventory affects the cash flow?

1.6 Limitations of the Study

This study dealt on inventory management, not on other dimensions of STC. Analysis was concentrated on some managerial, financial, accounting and planning aspects to which inventory management linkage.

The study has certain limitations which are given follows:-

a) The study will be based on ten fiscal years of 2063/2064 to 2067/2068.
b) The study will be more specific in inventory management and cash flow, not on the other financials area.
c) The data are taken from secondary sources.

The conclusion derived from this study will not be applicable to all kinds of trading companies.

1.7 Organization of the Study

This strictly report was divided into five different chapters.

- The first chapter included introduction along with general background of the study, statement of the problem, objectives, significance, limitations and organization of the study.

- The second chapter is review of literature it includes the fundamental concept, various dimensions of inventory management and relation of inventory management to profit and control. This chapter was divided into two portions, first being theoretical framework and second was review of the previous studies.

- The third chapter dealt with research methodology consisting of introduction, research design, nature and sources of data, data gathering procedure, tools and techniques of data analysis.

- The fourth chapter was the main portion of the study. It dealt with presentation and analysis of data collected from different sources. The collected data were analyzed to reach closer to the actual result by using various necessary financial and statistical tools and techniques.

- The fifth chapter provided the summary, conclusion and recommendation of overall study. At the end an extensive bibliography and annexes were also included.

CHAPTER TWO
REVIEW OF LITERATURE

2.1. Inventory

Inventory is one of the most important liquid assets to many business concern, government as well as non government sector. Inventory means all movable items that are store either ready for sale or for consumption in the course of production with a view to convert them into finished stock for sale. Thus inventory includes stock of raw material, work in process, finished goods and supplies. Inventory form a material part of working capital requires a considerable investment. (Goet, 1985: 255)

The term „inventory" represents the stock of consumable items like raw materials, semi-finished goods, finished goods, supplies etc. held by the firm waiting either for sale or production or its utilization to achieve their respective goals. Every big or small business organization has to maintain the some level of inventory in the store. The term inventory refers to the input of the product, a firm is offering for sale and the components that make up the product, hence it includes raw material, work in progress, finished product etc. In other words, "inventory is composed of assets that will be sold in future in the normal course of business operation." (Khan & Jain, 2003:20.3)

Inventory serves as the cushions at the time of shortages and provides the efficient use of resources as well in the organization. Every organization requires inventory and inventory require careful plan and formulate the best policy, keeping in view the best for the organization. Depending upon the nature of the organization, inventory management technique may vary.

Inventory management involves the optimal level of inventory planning and controlling which is supported by the trained employees and top management of the organization. It involves the financial dimension and physical dimension which keeps the cost of the organization and they are interrelated. They are not looked in isolation. Inventory management helps to maintain the required level of stock at the lowest cost. The required level of inventory is determined by the demand of the goods and the policy of the purchasing department of the organization. The duties of purchase department are to acquire, receive and store the inventory safely and identify the surplus and risk relating to inventory and then taking action to reduce the risks.

Inventory management is the integral part of almost all of the organization. So, existing policy of the inventory management of the Salt Trading Corporation cannot be isolated, where as its aim is to avoid excessive and inadequate level of inventory and maintain sufficient level of inventory for the smooth sales and marketing operation. The main transaction of Salt Trading Corporation are related to consumable product, agricultural product, plant and machineries, construction product, fuel, lubricants and other product. Among the different aspect of management level, inventory management plays a significant role in management of raw materials, part of supplies, work in process and finished goods of these product, then records on the books and store safely. A system to maintain the optimum level of inventory based on number of ordering and following a recording procedure based on the predetermined inventory level.

Basically the organization keeps the inventory for certain motive such as transaction motive, speculative motive and precautionary motive. Inventory is the tangible assets which are held for sale in the ordinary course of business, or in the process of production for sale.

2.2. Types of Inventory

Inventory lies in between the bridge of production and sale of product. The various forms of materials and goods held on store in the organization for future uses are known as inventory. Inventory remains in the various steps of the organization, at first for raw material, second for work in process, third for finished goods and then fourth for retail store. The various forms of inventory which appear in manufacturing as well as trading houses are raw materials, work in process, finished goods and part of supplies.

Raw Materials: - The basic inputs for the organization are known as raw materials. They are converted into the finished goods through the various processing operation. These types of inventories are purchased and stored by the organization for the production purpose of finished goods. The level of raw materials inventories is influenced by anticipation production, seasonally of production, reliability of sources of supply and the efficiency of scheduling purchase and production operation. The materials are classified in two type i.e. direct materials and indirect materials. Direct materials include all materials and parts that are an integral part of finished goods and its contribution can be directly identified into the finished goods. As well in indirect materials also includes, all materials which supported and facilitated in production process of the product.

Work in Process: - The goods they need to work more before they are converted into the finished goods are known as work-in-progress. These categories include those materials that have been committed to the production process but have not been completed. "Goods in process include such items as components and sub assembles that are not yet ready to be sold." (Hampton, 1990 :241) Sometimes it is very difficult to identify whether that is finished goods or work in process or raw materials, because same materials may be finished goods for one organization or that is work in process for another organization and that is raw materials for other organization. It is depends upon the nature of an organization.

Finished Goods: - The products which are ready to sale in the market and ready to use is finished goods. The inventories of such goods are completely finished products and they are ready for sale in the market. The stock of raw materials and work-in-process plays crucial role to facilitate production while stocks of finished goods are required to facilitate smooth marketing and sales operation. Thus, inventories play as bridge to link between the production and consumption of goods.

Supplies: - The goods that play supporting role to operate day to day operation of an organization are supplies. Every organization must keep the stock of supplies for effective and efficient operation. Stocks of supplies includes, stationeries, spares parts for maintenance and operation of machinery, soap, brooms, oil, fuel and light bulbs etc. These materials are not directly used in production process but they are necessary for supporting materials for production process.

2.3. Objectives of the Inventory Management

The inventory is the most important aspects of all business organization or trading concern and manufacturing organization. So, it is necessary to manage inventory by every organization properly, either by trading houses or by the Manufacturing houses as well. For the effective return, every organization must keep the adequate quantity of inventory. The stock of inadequate and excessive inventory may cause the increase in cost of the organization.

For example if the excessive stock of inventory is piled the fund of the organization is consumed, which indicate that the capital can't be used for another purpose thus the organization may lose another opportunity. The carrying cost such as the cost of insurance, storage, handling, recording and inspection also increases the proportion of volume of inventory increase. These costs ultimately affect the profitability for the organization. On the other hand inadequate level of

stock of the inventory is harmful for the organization. Inadequate level of inventory means under investment or scarce supply of goods at the time of demand. As the result, the consumer may shift to competitors and organization loses their permanent customers. Whereas, if the organization keeps excessive quantity of inventory then liquid assets will be blocked and the carrying cost will be high. Therefore, the organization must keep optimal level of inventory. To maintain the proper level of stock or optimal level of inventory the organization used different types of tools and techniques. But it is difficult task to the top management. Optimal level of inventory lies in between the two danger points i.e. excessive and inadequate.

The optimal level of inventory management should be control over the investment in inventory and keep in at optimal level and ensure regular supply at the time of demand. Optimal level of inventory maintains the sufficient level of stock at the time of shortages and price changes. It also minimizes the carrying cost and ordering cost and reduces the lead time. Optimal level of inventory maintains a large size of inventory for efficient and smooth production and sales operation and maintains a minimum investment in inventories to maximize profitability.

The main objectives of the inventory management are to determine and maintain the optimal level of inventory of an organization. The optimal level of inventory always lies in between the two danger points i.e. excessive and inadequate. Organization should always try to avoid the under investment and over investment in the inventory. Due to over investment, unnecessary amount of capital is tie-up and those capitals can't be invested in another purpose. So, the organization may lose another opportunity. This keeps carrying cost as well as risk of liquidity. The excessive cost directly impacts the profitability of the organization or in other word decreases the profitability. It is not easy to supply the inventory to the customer without demand. So over investment on the inventory should be cut down by the organization to maintain the optimal level. Whereas under investment on the inventory is also not good for the business organization. If the demand of the goods can't meet then the customer may shift to competitors and goodwill of the organization will be lost. Therefore optimum level of inventory is always maintained on the basis of trade off between the cost and benefit. Thus the objective of the inventory management of an organization is to maintain the optimum level of inventory which is neither excessive nor inadequate. The objectives of the inventory management are to supply all kinds of inventory regularly in such a manner that there is no shortage of materials and the production has got to be stopped. It also helps to collect the inventory at a fair price and reduce the wastage at the time of store in the warehouses. It reduces risk of spoilage and obsolescence of inventory by using the LIFO and FIFO and makes a proper supply of materials so that profit will be maximized

2.4. Need and Importance of Inventory Management

Inventory, by nature is circulating assets sand exhausts frequently because of consumption or sale. Inventories of any organization are pivotal. If the organization does not pay attention on the management of inventories, the organization's efficiency and profitability are severely affected. So, some important roles played by inventory management of the organization are as follows:

- Inventory helps for the smooth and efficient operation of business organization.

- Inventory facilitates service to customer immediately or at the time of short period.

- If there is absence of inventory, the organization may have to pay high prices because of piece-wise purchasing of inventory. Inventory is maintained by the organization then price discount opportunities can be obtained on bulk purchasing.

- Inventory also acts as buffer stock when raw materials are received late which may force to reject many orders.

- Inventory also reduces product cost because there is an additional advantage of batch production and smoothen productions runs.

- Inventory helps to maintain the economy by taking advantages of the price fluctuations.

2.5. Costs Associated with Inventory

Inventory Management and control is an important approach in profit-oriented enterprises. Inventory Management is merely a tool of management. It is not an end of management or substitute for management. It facilitates the managers to accomplish managerial goals in a systematic way. As mentioned earlier, both excess and inadequate purchases are costly to the firm. It is because if less quantity is ordered, number of order increases and consequently ordering cost increases. On other hand, if more quantity is ordered, the carrying cost increases. The first step of inventory management is to identify all those cost which are associated with purchasing and maintaining.

- **Carrying/holding cost: -** The costs which are related to maintaining inventory in a company's warehouse is carrying cost. That cost includes things like rent, utilities, insurance, taxes, employee costs, maintenance cost, security cost, other overhead and the opportunity cost of having capital tied up in. These cost increases the cost of goods and the products price is comparatively high in the market.

- **Opportunity cost: -** This consists of cost of capital i.e. interest on capital used to finance for acquisition of inventory. If the capital of the organization is locked up in inventory then organization may lose best opportunity to invest for another purpose.

- **Handling cost: -** Those cost which are associated with receiving inspection of goods. It is determined on the basis of quantity of goods, distance of store houses and many more.

- **Storage cost:** - Those costs are associated which maintaining the inventory at the time of store. These cost includes the expenditure made for the inventory staff, expenditure made for the various facilities like cost of heating, cost of floor space, cost of shelves, cost of lighting, cost of bin and container, cost of goods handling material, and other provision for safe and proper storage items. These costs are generally depended on the quantity of goods.

- **Spoilage and shortage cost:** - This is another type of inventory carrying cost. Because of shrinkage and pilferage of inventory makes adverse impact on profitability and assets of the organization.

- **Cost of depreciation: -** Investment on the machinery and equipment decrease over time. Thus the organization must make provision of depreciation of the equipment used is storing of goods.

- **Ordering cost: -** The ordering costs are based on the number of the order. The most obvious cost are those involved in the acquisition of the inventory, including the expenses of such clerical operations as filling, reviewing the requisition, processing the purchase orders, checking the incoming vouchers and paying the bills. The most important features of these costs are 'one time costs' and therefore they may be treated as fixed cost. Moreover, ordering cost which is also called procurement costs tend to have both fixed and variable characteristics. They may vary considerable for different commodities. Larger the quantity, the ordering cost per unit will be because the entire expenses of the order are spread over more items. Firm's that purchase materials in large quantities are usually able to obtain a

reduction in the unit price of the items. These quantities discounts presumably reflect cost reduction making lower handling, shipping, clerical or manufacturing costs. Generally, the carrying cost are variable and they are depended on the average size of inventory but in the case of ordering cost, it is usually fixed and does not change with size of the inventory. Ordering cost or procurement cost or acquisition cost is calculating by using the following formulae:

$$Ordering\ cost = \frac{Annual\ Requirement}{Quantity\ order\ size} * Ordering\ cost\ per\ order$$

- **Stock out cost: -** If the goods go out of the stock before the demand for the product is terminated or the stock of raw material go out of stock before the production process is called stock out cost. Alternatively, if the goods are not available at the time of receiving orders, it losses the possible profit as well as goodwill from customers. Stock out makes production process disruption. Some firms feel so strongly about avoiding this type of cost that they offer the customer substitutes of greater value than the item from a competition themselves and serves the customers at a loss.

2.6. Technical Formulation

The most of the common problem appeared in every business firm is how to establish and execute inventory policies. How much they should buy at a time? How low should they let inventory to fall before they replenish it? From whom they should buy and how should they ensure getting the lowest price available. It should always consider such kind of questions of every business firm inventory management which decreases cost of the firm to increase the profit.

2.7. Inventory Control system

Basically, there are two types of approaches for inventory control system i.e. unit control system and value control system. In unit control system, it involves the control over inventories in terms of unit on the other hand value control system entails the control over inventories in terms of value. The inventory control is a system it ensures the provision of the required quantity of inventories at the time of requirement with the minimum amount of investment. In the words

of John L. Burbidge "Inventory control is concerned with the control of the quantities and or monetary values of these items at predetermined level or within safe limits." Thus, the function of inventory control system is to obtain the maximum inventory turnover with the sufficient stock to meet all requirements of the firm. These two approaches seem to be conflicting. Unit control system of inventories ensures stocks for continuity of operations and sales as well. It will increase the cost of handling the inventory and investment. Thus, an optimum control is achieved when the required materials can be obtained at a minimum cost through proper planning, formulation of policies and procedure in order to maintain the inventory level at a desired point. The quantity of inventory to be kept is decided after taking into consideration the availability of finance, the quantity discount allowed, the cost of shortage and store accommodation, order placing and receiving cost, risk of loss due to falling prices, deterioration, evaporation, obsolescence, theft, economic orders, quantity and obtaining time or delivery time etc. Therefore, it is necessary that proper co-ordination must be there in the activities and policies of purchase, production and sales department to affect the better inventory control.

2.8. Techniques of Inventory Control

For effective and efficient control of inventory, the following types of techniques are employed by the firm:

a) **Fixation of stock level: -** The firm carrying excessive or inadequate inventories is dangerous. If the inventory is too little in the firm, the firm faces stock out involving high ordering cost and if the inventory level is too high in the firm, the firm faces unnecessary tie up of capital. Therefore, an efficient inventory management requires maintaining an optimum level of inventory where inventory costs are the minimum and at the same time there is no stock out which may result in loss of sale or stoppage of production.

b) **Minimum stock level:** - This represents the minimum quantity of the materials which must be maintained in hand at all times. The quantity is fixed so that production may be held up due to shortage of the material. In fixing this level, the following are taken into consideration:

- Lead time i.e. time lag between indenting and receiving of the material. It is the time requires replenishing the supply.
- Rate of consumption of the material during the lead time.
- Nature of the material. Minimum level is not required in case of special

materials which is required against customer' s specific order.

The minimum stock level is determined by the using following formula:

$$Minimum\ stock\ level = Reorder\ level - (Normal\ Consumption * Normal\ lead\ time)$$

Where,

$$Average\ consumption = \frac{Maximum\ consumption + minimum\ consumption}{2}$$

$$Average\ lead\ time = \frac{maximum\ lead\ time + minimum\ lead\ time}{2}$$

c) **Maximum stock level:** - It represents the maximum quantity of an item of materials which can be held in stock at any time. Stock should not exceed this quantity. The quantity is fixed so that there may be no overstocking. Overstocking should be avoided as far as possible. It is an upper limit beyond which the quantity of any item is not normally allowed to rise. Holding of stock more than limit will increase material and storage cost, tied up working capital unnecessary. The maximum stock level is affected by availability of financial resources, store space, lead-time, and nature of material, reasonability of material and government control. The maximum level is fixed by considering the following points.

- Re-order level.
- Minimum consumption rate during lead time.
- Minimum lead time or re-order period and
- Re-order quantity.

d) **Average stock level: -** An average stock level indicates the average stock held by the firm.

e) **Re-order level: -** When the quantity of materials reaches in a certain figure then the fresh order is sent to get materials again. It is the point at which if stock of a particular material in store approaches, the storekeeper should initiate the purchase requisition for fresh supplies of those materials. This level is fixed somewhere between the maximum and minimum levels in such a way that the difference of quantity of the material between the re-ordering level and the minimum level will be sufficient to meet the requirement of production up to the time the fresh supply of the materials is received.

- **Safety stock: -** For practical purpose, minimum stock level is safety stock and it is calculated by using following formulae:

- **Danger level: -** It is that level beyond which materials should not fall in any case. If the danger level arises then immediate steps should be taken to replenish the stock even if the more cost is incurred in arranging the materials. If materials are not arranged immediately there is possibility of stoppage of worker. This means a level at which normal issues of the materials are stopped and issues are made only under specific instruction.

2.9. Economic Order Quantity (EOQ)

2.9.1. Introduction

Another important inventory control technique is economic order quantity. The quantity of material to be ordered at one time is known as economic ordering quantity. This technique is widely used these days in many countries irrespectively of under developed or developing in nature. A decision about how much to order has great significance in inventory management. The quantity to be purchased should neither be small nor big because of buying and carrying materials are very high. The economic order quantity is the size of the lot to be purchased which is economically valuable. This is the quantity of materials which can be purchased at minimum total cost. EOQ is important concept in the purchase of raw material and in the storage of finished goods and transit inventories. To determine the optimal order quantity for a particular item of inventory, given its forecasted usage ordering cost and carrying cost. Ordering can mean either the purchase of the item of its production (Van Horne, 2003:377). Generally, economic order quantity is the point at which inventory carrying cost are equal to ordering cost. Ordering or set up cost and holding or carrying cost constitute the total cost of inventory excluding materials cost. To determining EOQ, it is assumed that cost of managing inventory is made up solely of two parts i.e. ordering cost and carrying

cost. Re-order quantity is such that when it is added to the minimum stock, it should not exceed the maximum stock. The following are the prerequisites of EOQ:

- Holding cost per unit per year (period).
- Ordering cost per order.
- Annual requirement or quantity required per period.
- Cost per unit.

Assumptions of the EOQ model are:

- The forecast/demand for a given period is known
- The usage/demand is even throughout the period
- Inventory orders can be replenished immediately, no delay in placing and receiving orders
- There are two cost associated with inventories i.e. ordering cost and carrying cost
- The cost per order is constant regardless of the size of order
- The cost of carrying is a fixed percentage of the average value of inventory.

2.9.2. Determine of Economic Order Quantity

a) **Mathematical or formulae method:** - Mathematical models are also available to calculate EOQ. There are numerous model exist as the field of inventory management and can be studied in college programs such as production and operation research management. Even many mathematical models are exists, the main objectives of their model is to reduce and minimize the inventory costs. Without getting into highly refined models, the firm cannot get a good decision. We can illustrate the concept of EOQ with a basic mathematical model as follows. The order for the material to be purchased should be large enough to earn more trade discount and to take advantage of bulk transport, but at the same time it should not be too large to incur too heavy a payment on account of interest, storage and insurance costs. If the price to be paid is stable, the quantity to be ordered each time can be ascertained by the following formulae:

If the firm orders EOQ units each time, it will minimize the total inventory costs. To sum up, EOQ is determined keeping in view the ordering costs and carrying costs.

b) **Trial and error approach:** - This is another type of approach to calculate the EOQ. A firm has a different type of purchase policy of its inventory. It can purchase its entire requirement on a single lot. Alternatively, the firm can purchase its inventory in small lot periodically like weekly, monthly, bimonthly, half yearly and so on. It means more than one time the firm can place an order to purchase inventory. The smaller the lot sizes the lower average inventory and vice versa. How inventory holding are associated with high ordering cost and low carrying cost. This approach to determine of EOQ and uses different permutation and combination of total cost of inventory purchases so as to find out the total cost. According to this approach the carrying and ordering cost for a different sizes of order to purchase inventories computed and the order size with the lowest total cost (ordering + carrying) of inventory is the economic order quantity.

c) **The graphic approach:** - By using graphic, economic order quantity can also find out. It can be seen given below picture very well and it also illustrates the EOQ function. The economic ordering quantity can also found out graphically. Figure 2.1 given below illustrates the EOQ function. In the figure, carrying, ordering and total costs are plotted on vertical and horizontal axis is used to represent the order size. From this figure, carrying, ordering and total costs are plotted on vertical and horizontal axis is used to represent the order size respectively. Total carrying cost increases as the order size increases because on average, a larger inventory will be maintained and ordering cost decline and vice versa.

The behavior of total cost line is noticeable since it is a sum of two types of costs which have differently with order size. The total cost decline in the first instance but they start rising when the decrease in average ordering cost is more than offset by the increase in carrying costs. The EOQ occurs at the point „Q“ i.e. at minimum total cost. Thus the firms operating profit is maximized at point „Q“. It should be noticed that the total cost of inventory are fairly insensitive to moderate changes in order size. It may, therefore, be appropriate to say that there is an economic order range, not a point. To determine this range, the order size may be change by some percentage and impact on total cost may be studied. If the total costs do not change very significantly, the firm can change EOQ within the range without any loss (Pandey, 1999:888)

2.10. System of Ordering (When to order)

The problem of how much to be ordered is solved by determining the economic order quantity. The second problem is when to be ordered? It is related to determine the reorder point. It is also known as order point or optimal re-order point or re-ordering level or ordering level. It is the point at which if stock of material falls down then the store keeper initiates the purchase requisition for fresh supply of materials. This level is fixed somewhere between the maximum and minimum level in such a way that the difference between re-ordering level and maximum level will be sufficient to meet the requirement of production up to time the fresh supply of the material is received. As long as delivery is not instantaneous, an order must be placed so that inventory is not depleted till a new shipment arrives. This required inventory level is termed 'transit stock' and represent the amount of inventory that would be used or sold between the time an order is placed and time delivered. Transit stock is determined by using the following formulae:

The re-order point is the level of inventory at which the firm places an order in the amount of the economic order quantity. If the firm places the order, the inventory reaches the re-order point and the new goods will arise before the firm runs out of goods to sell (Hampton, 1993). Thus, basically these items of information are needed as inputs to design the reorder point. The safety stock involves two types of i.e. stock out cost and carrying cost. Safety stock is necessary under the condition of uncertainty. In such a situation the demand and supply of goods may fluctuate day by day. If the actual usage or sales increase and delivery from supplies are delayed, the firm would face a stock out problem. The firm would therefore be advised to keep a sufficient safety margin by having additional inventory to guard against stock out situation; such stocks are called safety stock. The following figure represent over the inventory levels overtime when transit and safety stock are taken into consideration:

2.11. Always Better Control (ABC) Analysis

Manufacturing organizations find it useful to divide materials into three categories for the purpose of exercising selective control on materials. An analysis of the materials costs will show that a smaller percentage of items of materials in the stores may contribute to a large percentage of the value of consumption and, on the other hand, large percentage of item may represent a smaller percentage of the value of item consumed. Between these two extremes will fall those the percentage number of which is more or less equal to their value of consumption.

Item falling in the first category are taken as „A‟ item, of the second category as „B‟ items and item of the third category are treated as „C‟ items. Such an analysis of materials is known as ABC analysis. Thus, under this technique of stock control, materials are listed in „A‟, „B‟ and „C‟ categories in descending order based on money value of consumption. According to P.V. Kulkarni "Inventory control is a science based art of ensuring that enough inventory or stock is held by an organization to meet both its internal and external demand commitments" Usually, every business firm however big or small has to maintain several types of inventories. It is not desirable to keep the same degree of control on all the items. The Firm should pay maximum attention to those items whose value is the highest. The firm should therefore classify inventories to identify which items should receive the most effort in controlling. The firm should be selective in its approach to control investment in various types of inventories. This analytical approach is called the ABC analysis and tends to measure the significance of each item of inventories in terms of its value. In other words ABC analysis is the application of stock holding of Pareto's law which shows that the majority of inventory value will be represented by relating few items.

The ABC analysis concentrates on important items and is also known as Control by Importance and Exception (CIE). As the items are classified in the importance of their relative value, this approach is also known as proportional value analysis. The term ABC analysis is known as Always Better Control. Under this technique of material control, materials are listed in A, B, and C group in descending order based on money value of consumption as follows:

High price materials..... A
Medium price materials .....B
Low price materials C

It has been shown the following classification as being representation in many industries:

2.12. Just In Time (JIT) Inventory System

This is a new model for inventory management system so most of the modern business enterprises are nowadays applying for new strategy. It is just in time inventory management system. In this system the ordered materials and parts are arrive only at the time of supply to the customers. This system prime role is to save the cost of the corporation. Products are not produced or inventories are not ordered unless need arises under the system. Thus, inventories are not ordered or

maintain relatively a low inventory level. The main objective of this system is to avoid or reduce the level of inventory of the corporations. The JIT system reduces the sizable amount spend on inventory and other related factors. The special features of JIT system are as under:

- A smooth uniform production
- A full method of coordinating in the production process
- High quality of materials and finished goods
- Purchase of materials and parts in small lot size
- Effective preventive maintenance of equipment
- Skilled workers and flexibility in facilities

2.13. Inventory System

Basically, there are just two types of inventory system. They have a numerous variations. One is termed as the fixed order size system, a fixed quantity of goods is ordered whenever inventory deeps below a predetermined level. The time between orders varies with the demand rates, but the size of the order remains constant. In practice, fixed order size system is generally called perpetual inventory system, since up to date records of the inventory's status are kept. Each time, items are withdrawn from or added to reflect the new status. These posting operations may be done manually on inventory records cards or as in increasingly the case through remote input terminals to a computer file. In general, only class A and B inventory are maintained in this fashion.

The two bin system and application of the fixed order size approach is one of the oldest inventory systems in use. For e.g. let us imagine that all materials or given types is placed in two large bins. When the first is empty, the second is put into use and a replacement order for a fixed amount is dispatched immediately when the new materials arrive, it is placed in the empty bin and the process continues. In the second basic type of the fixed order interval system, periodic reviews of inventories are made at which time they are restored to some predetermined optimum level. No running records of daily inventory activities are kept. The status of the inventory is known only at the time of the review, which may take place weekly, monthly, quarterly or yearly. Because of this, inventory systems of this are commonly called 'periodic inventory system' such system are generally used for class B or C inventories or instances where the large number of items precludes the updating of each inventory transaction.

- Perpetual Inventory System: System that keeps track of removals from inventory continuously, thus monitoring current levels of each item.

- Two Bin Systems: Two containers of inventory, reorder when the first is empty.

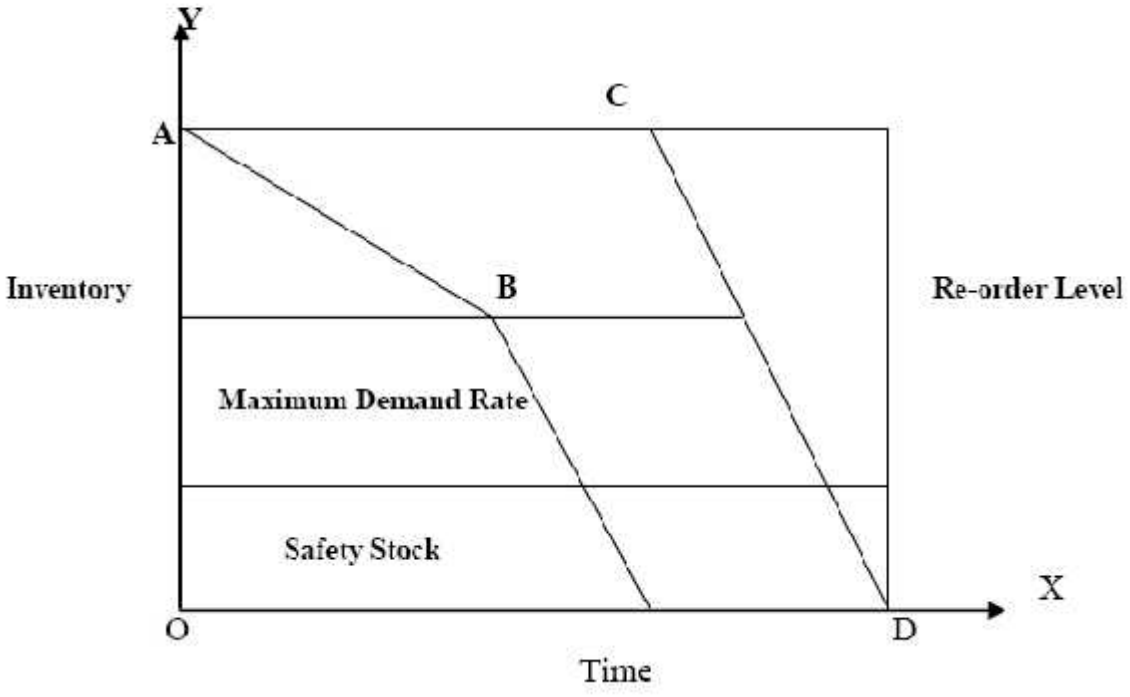
- Universal Bar Code: Bar code printed on a label that has information about the item to which it is attached.

2.14. Safety Stock

The amount of safety stock required in perpetual inventory system is determined solely by the amount of stock needed to guard against a stock out during delivery time of the amount of safety stock added to normal inventory in hand is greater than the maximum amount sold during the delivery time, then the chances are excellent that no shortage will result.

Figure: 2.3

Relationship of Fixed Order size and Safety stock



In the above figure 2.1, assume that the demand proceeded at an expected pace from point A to point B an order was entered for the fixed order quantity. Then in the interval from B to C and from C to D, demand rise to maximum levels. Since, the safety stock plus the inventory that remained when the order was placed were equal to maximum demand, no stock out occurred. Instead, all that happened was that orders were placed in an increasing rate.

2.15. Perpetual Inventory System

The institute of cost and Management Accountant, London, defines the perpetual inventory as “a system of records maintained by the controlling department, which reflects the physical movement of stocks and their current balance”. The perpetual inventory system is maintaining of regular stock records is commonly known. In fact, perpetual inventory system implies a complete and up dated of each item of stores both on records and physical goods. The institute of cost and management accountant of England and Wales define perpetual inventory system as ' A system of record maintain by the controlling department, which reflect the physical movement of stock and their current balance'. Thus, this is a system of ascertaining current balance after recording every received and issue of materials and stock records. The continuous stock taking is an essential future of the perpetual inventory system. Inventory records maintained under LIFO and FIFO basis are the best example of perpetual inventory system. The perpetual inventory system means maintenance of such records (stock control cards, bin cards and store ledger) as it will reflect the receipts, issue and balance of all items in stock at all times.

2.16. Comparison of the Periodic and Perpetual Inventory System

Both systems are designed to control inventories in the face of uncertainty. Whether one or the other is employed in a particular instance depend upon the nature of the items stocked, the type of controls needed and the nature of the source of supply. The fixed order size system is well suited for managing inventories of low value items since, it permits looser control. Items of this sort are usually bought in large quantities relative to their use and can be readily obtained from the supplier at any time. They can be controlled by a simple two bin process without a large investment in record keeping, perpetual inventories also lend themselves to the stoking of high cost items that can be purchased at any time. Their items are controlled by continuous posting to inventory records. In this way of the status of the high cost items can closely watched. This is costly, however, for inventories with a large number of items, since the critical costs are high, yet, with the use of computers, such costs can be reduced. The broader application of perpetual inventory records made feasible by computers will in turn result in closer of inventories. The fixed interval system lends itself to inventories that consist of large number of products because the clerical cost of periodic evaluation is substantially below that required for perpetual recording. This system is also well suited for items whose availability may be limited because of the supplier's demand for periodic orders so that they can plan their production runs

economically. In order to use the fixed order interval system, however higher safety stocks must be maintained

2.17. Introduction of Cash flow and cash flow statement

Cash is the lifeblood of business enterprises. Without cash no activities can take place. So a business must have an adequate amount of cash to operate. As such the decision makers must pay close attention to the firm‟s cash position and events and transactions that affect cash position to change. The analysis of events and transactions that affect the cash position of the company is termed as cash flow analysis. Cash flows analysis is done through statement of cash flow. It is a statement which shows the inflows and outflows of cash and cash equivalents during the year. A cash flows statement is a statement of company‟s ability to generate cash from various activities such as operating, investing, and financing and their need of cash. A cash flow statement is defined as "a statement of company‟s ability to generate cash from various activities and their need of cash." Every enterprise should prepare a cash flow statement and should present it as integral part of its financial statements for each period for which financial statements are presented.

2.18. Importance of Cash flow and Cash flow statement

In recent year the statement of cash flows has come to be viewed as a part of full set of financial statement. Cash flow statement provides relevant information about the cash receipts and cash payments of an enterprise during a period. Information about enterprises cash flow is useful in assessing its liquidity, financial flexibility, profitability and risk. Information about cash flow is useful in many ways. It can also influence the decision makers in many ways. Decision makers may be investors‟ creditors and management. Investors have to decide whether to invest or not in a given company. Investors will value higher to the company whose regular operating cash flow is more than uses. Creditors have to decides whether to provide credit facility or not, to the given company. Information about cash flow can help creditors decide whether a company will have enough cash to pay the debts as they mature. Management has to evaluate whether the company has ability to meet unexpected obligations and ability to take advantage of new business opportunities that may arise. And for this, the management has to use cash flow analysis.

A cash flow statement, when used in conjunction with the rest of the financial statements, provides information that enables users to evaluate the changes in net assets of enterprises, its financial structure (including its liquidity and solvency) and its ability to affect the amounts and timing of cash flows in order to adapt to changing circumstances and opportunities. Cash flow information is assessing ability of the enterprises to generate cash and cash equivalents and enables users to develop models to assess and compare the present value of the future cash flows of different enterprises. It also enhances the comparability of the reporting of operating performance by different enterprises because it eliminates the effects of using different accounting treatments for the same transactions and events.

Historical cash flow information is often used as an indicator of the amount, timing and certainty of future cash flows. It is also useful in checking the accuracy of past assessments of future cash flows and in examining the relationship between profitability and net cash flow and the impact of changing prices.

2.19. Objectives of Cash flow statement

The cash flows statement of enterprises is useful in providing information to the users of financial statements about the ability of the enterprises to generate cash and cash equivalents and the needs of the enterprises to utilize those cash flows. Information about the cash flows of an enterprise is useful in providing users of financial statements with a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs f the enterprises to utilize those cash flows. The economic decisions that are taken by users require an evaluation of the ability of an enterprise to generate cash and cash equivalents and the timing and certainty of their generation. The objectives of International Accounting Standard is to require the provision of information about the historical changes in cash and cash equivalents of an enterprise by means of a cash flow statement which classifies cash flows during the period from operating, investing and financing activities. The main objectives of cash flow statement are mentioned below:

- Cash flow statement will help the financial manager to explain the situation of sufficient cash balance in hand despite the business incurred loss or short of cash balance even if the business is making huge amount of profit.

- Comparison between cash budget and cash flow statement may prove to be useful for the management for preparing cash budget for the period to come.

- With the help of cash flow statement, the management can find out the causes of changes in the cash position on two dates.

- Evaluation of financial policies can be done with help of cash flows statement.

- As the cash flow statement helps the management to know and predict its cash position, it can plan its policy and make decisions regarding the redemption of debentures, purchase of fixed assets and so on. (Munankarmi, 2003; 13.02)

2.20 Review of Previous Studies

Literature review is basically a "stock taking" of available literature in one's field of research. The literature survey thus provides the students with the knowledge of the status of their field of research. The purpose of literature review is, thus, to find out what research studies have been conducted in one‟s chosen field of study, and what remains to be done. The studies have emphasized only the review of text books but attempt is only made to review the related studies conducted by different expert, scholars in related with inventory management. There are limited studies undertaken on 'Inventory management' in Nepal were reviewed in the course of study. A study relating to Nepal Transport Corporation with various aspects has been made by CEDA, one of the major findings was that though inventory management of this factor is rather simple but due to management of stocking of spare parts it hampered for the smooth operation of the enterprises.

Inventory management exports claims that the Inventory management in Nepal is probably the weakness aspect of management. The tools and techniques for controlling inventory have been apply in Nepalese enterprises for controlling their physical as well as financial dimensions The efficient management of inventory, there are the needs of tackling human element the third world country like Nepal. They have suggestion to orienting the attitude of the staff's towards materials cost because lack of knowledge and carelessness, which were the responsible of this management of inventory.

Bajracharya, Puskar, (1983), has conducted his study on "**Management in Public Sector Manufacturing Enterprises in Nepal"** submitted to faculty of management T.U. The main objectives of his study were to found out the different problems faced by public sector manufacturing organization in Nepal. One of the

important findings was the inventory management suffers from the lack of planning, high carrying cost, poor record keeping and stores management and virtual absences of controlling system. **Sharma, Vijaya,** (1999), on his study of "**Inventory Management: A case study of AIC Regarding Seeds"** submitted to faculty of management T.U. indicates that the inventory turnover ratio was an indication of the efficiency of Management. The very low inventory turnover ratio of wheat seeds shows an inefficient inventory management system. **Shrestha, Indira,** (2000) had conducted on study the topic of **"Inventory management of manufacturing industries in Nepal with special reference of Quick Foods"** submitted to faculty of management. The study depicted the same type of problems as the previous related studies. The inputs necessary to produce noodles and cheese balls were found to be estimated by the company. The economic order size, handling charges, maintaining ordering and carrying charges etc were predetermined unscientifically and did not use any type of analytical tools and techniques which were not helping the company in reducing unnecessary cost. Re-order level, minimum stock, safety stock, maximum stock and danger level help to maintain optimum level of inventory which were not given serious consideration while deciding the size and level of various raw materials in the factory. The lead time was not also considered.

The findings of the study were also common. The company did not follow any scientific tools and techniques such as EOQ models, ABC analysis, safety stock etc. There were no records kept properly and if these data will not available, no any tools, techniques and model can ascertain the exact result. It was impossible to determine how much to buy and when to buy etc. From this study, it was found that the inventory management of Thai Foods and Quick Foods Pvt. Ltd was worsened and it was also running under profit even through it required some improvements.

Pandey, Laxmi, (2000) had conducted a thesis on the topic of "**Inventory management; A case study of Gorkhapatra Corporation"**, submitted to faculty of management T.U. The study had extracted some problems as required inputs were estimated and economic order size, market price of inputs and unit price were fixed on the basis of annual requirements and they were fixed unscientifically and were not based on mathematical models. The main objectives of the study were to collect information which would assist in describing the current position of the Gorkhapatra Corporation as a means of mass communication in Nepal, to identify its development message and to measure its effectiveness, to suggest some measure for effectiveness of the Corporation. Purchased was made locally by corporation and it had no its own warehouse. The study had further determined that all the data should be properly recorded otherwise only tools or techniques become worthless in shortage of required data. The study had recommended the Corporation should apply the EOQ model and re

order point formulae to determine when to order. All the required inputs should be classified according to ABC analysis. The scrap materials should be recycled. Record keeping system should be scientifically used. Professionally qualified person should be recruited in their respective field of job.

Sidgel, Saroj, (2002), had conducted the research work regarding **"Inventory Management of Agriculture Input Corporation"** submitted to faculty of management T.U. according to the study the **AIC** was not using Scientific model of inventory management. Although they did not calculate EOQ for the supply of chemical fertilizer, they order lots of 1000 to 2000 M.ton. There was no evidence of taking discount by AIC. Lead time was not calculated properly. Re-order point was also not fixed .Regarding buff or stock, although AIC have capacity of sufficient warehouse throughout the country, it remains out of stock in season and overstock in out of season. AIC was not using ABC analysis also.

Dhakal, Govinda Prashad, (2006) has conducted a thesis on the topic of "**A study on Inventory Management and Control of Royal Drug Ltd"** submitted to faculty of management T.U. The main objective of this study was to find out what types of tools and techniques has been applied by the RDL to manage the inventory. It also tried to identify the problems which were underlying the inventory management and control system and the techniques employed by it. The studies some major findings pointed out on analysis work were when and how much to order were estimated haphazardly and order quantity fluctuates year to year. The RDL had established a separate unit for management of inventory although the separate unit unable to manage the inventory. The economic order quantity model has not applied so that its chemical materials are overstocking day by day and its safety stock is estimated roughly. At this moment, the RDL was able to produce good quality medicine because of its quality control system. The study also depicted there were inadequate level of finished goods, there were no attention for packaging materials managed efficiently.

Researcher suggested that the RDL should identify its goals and objectives clearly. The company should follow the quantitative models and techniques such as EOQ model and ABC analysis model so that the total cost is reduced. The ledger cards can also be used to manage inventory in a simple way. General Manager should be professional one and he should not be change frequently due to the political interference. **Gurgain, Puspa Prashad,** (2006) has studies on the thesis on a topic in **"Inventory Management (A comparative study of DDC and SGML)"** submitted to faculty of management T.U. DDC and SGML were established for supplying quality milk at reasonable price along with financially sound and contribute surplus to the national treasury. The study had reflected some

problems as due to the application of unscientific planning and control tools and techniques so the corporation was bound to bear unnecessary inventory holding and procurement cost. The objectives of study were to examine present inventory management and control system of DDC and SGML and their impact towards the companies' profitability. The studies also to examine the inventory management system as practiced by the both companies' and to suggest some models for effectiveness of the companies'.

The major findings of this were that the DDC and SGML had ineffective and inefficient inventory management system. The huge amount of money was blocked in the inventory. The both companies did not followed economic order quantity model for purchasing purpose. Both companies had not categorized its inventory for the purpose of control and paid equal attention for all type of inventory held in the time of store. Cost associated with ordering and holding inventory was not recorded separately which were recorded in total as a whole. There were no consistencies using principle of inventory management in closing stock of both companies. They made re-order after stock was finished. The inventory turnover ratio of the companies was not satisfactory and its sales and profit were fluctuating. The amount of profit was not positively increased as increased in sales. The DDC and SGML's efficiency in inventory was poor.

Miyan, Surphuddin, (2006) had conducted a thesis on '**Inventory management: A case study of Gorkhapatra Corporation",** submitted to faculty of management T.U. The main objectives of studies were to collect the information underlying constraints in existing management and control system of inventory and their impact towards the corporations' profitability. Corporation was run at profit accept in a few years. The studies also examined the existing inventory management system applied by corporation, to analyze the relationship between inventory/material cost and profit, and to suggest for some effectiveness tools and techniques for corporation. As the corporation was not following any tools, techniques and models to determine optimum level of inventory, this result the increased in unnecessary costs involving ordering and carrying cost. According to inventory management technique, there was no systematic in ordering size, lead time and safety stock. The purchase decision was made by the purchase manager through both quotation and tender. The study had recommended for the improvement in the present inventory management in the following manner. The corporation should define its goals and objectives clearly. It should follow all the scientific tools and techniques i.e. purchasing order, EOQ, safety stock, re-order point, ABC analysis etc. The company consider for proper storing was essential to improve. The ledger card can be used for record keeping system and its scrap material should be recycled. The corporation should procure a color machine for this competitive world.

Limbu, Hang Narayan, (2007) had conducted the thesis on "**Inventory management; A case study of Salt Trading Organization",** submitted to faculty of management T.U. Researcher presented Inventories to total assets, net sales and current assets ratio were fluctuate for five years but last two years, the ratio were higher than the other years. Initially the inventories to net profit ratio was negative thereafter it was continuously decreasing trend of ratio where their net profit is so high but last two years its' ratio was continuously rises. Inventories turnover ratio was decreasing trend throughout the study period. Mean of inventories holding days in seven fiscal years of last two years were so high. Trend of net sales and inventories were fluctuated in the same pattern while the co-efficient of variance of inventories was higher than the coefficient of variance of net sales. Trend of net profit (loss) remained constant and the co-efficient of variance of net profit was higher than co-efficient of variance of inventories. Trend of interest expenses was continuously increased in constant rate; there were high fluctuations of inventories. Co- efficient of variance of inventories was higher than the co efficient of variance of interest expenses. Purchases were found slightly increased while inventory was drastically increased and again decreased. Co-efficient of variance of inventories was higher than the co-efficient variance of purchases. Net sales exceeds purchase, however there was same trend of net sales and purchases in the end of period. Co-efficient of variance of net sales was slightly higher than co-efficient of variance of purchases.

Mainali, Shiva Kumar, (2008) had conducted the thesis on "**Inventory management and its impact on working capital management of Unilever Nepal limited",** submitted to faculty of management T.U. The main objective of this study was identifying the inventory management system of Unilever Nepal Ltd. In this study an attempt has been made to identify the inventory position of UNL, to know the relationship between sales and inventories with identifying their trends, to assess the inventories and their consequences on profitability of UNL and suggest over the better practice of inventory management of UNL.

The basic problem area of this study was to examine the inventory management system practiced by the company was unscientific. The carrying cost, ordering cost, order size safety stock maintained was unsatisfactory and unscientific. UNL did not pay much attention to the leadtime. **Gaire**, **Tara Nath,** (2009) had conducted the thesis on **"Inventory Management of Bottlers Nepal Limited"**, submitted o the faculty of management of T.U. The basic objective of the research was to examine the inventory policy, inventory management practice in BNL. Inventory management system of BNL was also neither scientific nor effective. Research was done to found out the polices of inventory management the company was using and the ways of managing inventory for the effective operation and the changes in inventory maintained by the organization during the study period and the impact of inventory on the profitability of the company. The

inventory, purchase and sales maintained by the company were fluctuated severally. It causes the decreased in the overall profitability of the organization.

2.21 Research Gap

Various studies were made relating to inventory management of different organizations. But there are few studies related to inventory management in Nepalese context. Those studies show the relationship of inventory with purchase and sales. But the relationship of inventory with cash flow was not done yet. So, the researcher tried to show the affect of inventory in cash flow.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Research Design

Research design is an overall plan or framework for the collection and analysis of data. To achieve the specific objective of the study analytical as well as descriptive studies were carried out. This study is an examination and evaluation of inventory management practices of STC. The information and data were presented in an analytical method but the qualitative aspects of the research such as effectiveness of inventory management views of personal of the enterprise and the theoretical dimensions were explained, wherever necessary. To achieve the goal of study, the study used secondary as well as primary data. Necessary financial and statistical tools were used to examine in fact and figure.

3.2 Sources of Data

The raw data, essential for the study were in the forms of published and unpublished state. Both secondary as well as primary data were collected in order to achieve the objectives of the study. For the reliability and effectiveness of research work, true and fact information's are necessary because information's are the life blood for any research work. This study used secondary data but primary data were also used collected through the observation and survey technique. The major sources of data are as follow:

- **Primary source of data:** The primary data were collected through the observation, survey and formal and informal interviews to a responsive person.

- **Secondary source of data:** The secondary data were collected from annul reports, balance sheet, and profit/loss account of Salt Trading Corporation.

3.3 Method of Data Analysis and Presentation

The collected data from primary as well as secondary sources were managed, analyzed, present in proper tables, and tabulated into necessary format systematically. Following financial and statistical tools were used to analysed and interpreted.

3.3.1 Ratio Analysis

Ratio analysis, financial techniques which were used to analysed and interprets financial statements. It helps in making decision as it helps establishing relationship between various financial figures. Ratio analysis isn't just comparing different numbers of the balance sheet, income statement, and cash flow statement. Ratios evaluate the relationships between individual values and relate them to how a company has performed in the past, and might perform in the future. Financial analysis is an evaluation of firm's post financial performance and its prospects for the future. Financial statement analysis involves the calculation of various ratios. The ratio analysis is the financial tools by which the financial strength and weakness are measured by relating two accounting data. The following ratios were used to analyse financial data:

3.3.2 Inventory Turnover Ratio

The stock turnover ratio indicates whether the investment in inventory management was efficiently used or not. It indicates the relationship between the cost of goods sold and the inventory level. In general, turnover ratios indicate the performance of inventory management. A lower turnover rate may point to overstocking, obsolescence, or deficiencies in the product line or marketing effort. However, in some instances a low rate may by appropriate, such as where higher inventory levels occur in anticipation of rapidly rising prices or shortages.

3.3.3 Inventory Holding Days (IHD)

An inventory to holding days represents the how many days the corporations hold the inventories in the warehouse year by year. An inventory holding days shows how many days corporation holds the average inventories. High inventories holding day's indicates availability of maximum stock of finished goods for sale. IHD will be calculated by using following formula:

3.3.4 Trend Analysis

The collected data from various sources were managed, analyzed and presented in proper tabular formats and diagrams. The techniques here included were statistical and inventory management techniques such as graph, time series analysis, Karl Pearson's coefficient of correlation, mean, standard deviation and

coefficient of variance had been used as necessary. The trend analysis was used for different variables which were as follows:

1. Trend Analysis of Net Sales and Inventories.
2. Trend Analysis of Net Profit and Inventories.
3. Trend Analysis of Purchases and Inventories.
4. Trend Analysis of Net sales and Purchases.
5. Trend Analysis of Cash flow and Inventories.

3.3.5 Correlation Coefficient and Regression Analysis

Regression Analysis was used as a tool of determining the nature of relationship between two variables. The models were used to make predictions of the unknown value of one variable from the known value of the other variable. Regression analysis was a mathematical measure of the average relationship between two or more variables in terms of original units of the data. In this analysis, regression equation x and y were used. Regression analysis models shows the relationship between one response variables (also called dependent variables, explained variables, predicted variables, usually named Y1…..Yn), and the predictors (also called independent variables, explanatory variables, control variables, or repressors", usually named $X_1,...,X_n$).

Where,

a = Y intercept or value of Y when X = 0 or constant
Y = Dependent Variables
X = Independent variables

b = slope of regression line (i.e. it measures the change in Y due to percentage change in X) or the regression of y on x, which is denoted by or coefficient. According to the principle of least square, two normal equations for estimating two numerical „a" and „b" is given below:

Where,
n = the number of pair observation.

The topic is related with the analysis of the relationship between:

1. Purchase of inventory and sales,

2. Inventory and net profit

3. Inventory and purchases

4. Net sales and purchases

5. Inventory and Cash flow

The two variables were said to be 'correlated' when they are related that the change in the value of one variable accompanied by the change in the value of the other. The measure of correlation called the 'correlation coefficient' summarizes in one figure, the degree and direction of movement. But the important thing that is to be noted here is that correlation analysis helps in determining the extent to which the two variables were correlated or not but it does not tell us about cause and effect. Karl Pearson's correlation coefficient is denoted by or simply „r‟. The correlation coefficient can be calculated .

n = number of pair of observations.

To test the reliability of the calculated value of 'r' probable error (P.E.) can be defined as follows:

Probable Error (P.E.) = 0.6745 x S.E If, /r/ < P.E. It is insignificant or not significant. So, there is no evidence of correlation. If, / r / > 6 x P.E. It is significant. In other cases, nothing can be concluded.

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

4.1. Analysis of Secondary Data

4.1.1. Inventory to Net Sales Ratio

Inventories to net sales ratio is desired to be low in corporation. Net sales mean that sales amount or actual amount which comes from the sales of salt, sugar, ghee, tea, cement, coal, tyre and tubes, wheat etc. The inventories to net sales ratio show the relationship between inventories to net sales in the corporation. If net sales increases, the net sales with low inventories level generate low ratio and vice versa. The low ratio indicates good inventories management where sales were generated by keeping minimum inventories

$$\textit{Inventory to Net sales Ratio} \; X \frac{\textit{Net sales}}{\textit{Inventory}}$$

Table: 4.1.1

Inventory to Net Sales Ratio

(In Crore Rs)

Inventory (Rs)	Net sales(Rs)	Inventory to Net sales Ratio (%)
25.50	173.85	14.67
16.55	184.24	8.98
28.99	158.05	18.34
19.99	174.32	11.47
37.07	187.59	19.76
68.81	246.10	27.96
47.07	389.89	12.07
78.99	219.39	36.00
87.66	185.06	47.37
71.45	191.63	37.29
61.17	213.90	28.60

In the above table 4.1.1 shows the inventories to sales ratio of eleven years. The lower ratio was 8.98 in the fiscal year 2063/064 while higher ratio was 47.37 in

the fiscal year 2064/065. Taking ratio 14.67% as base, ratios of fiscal year 2063/064, 2064/065 and 2063/064 were formed low and satisfactory. While the ratios of the rest year, are higher than other years. The inventory ratio to the sales was 47.37% in the fiscal year 2066/067, was unsatisfactory. The ratios of the years 2067/068 had been decreased because of decreases in inventory and increase in net sales. But in last year, ratio decreased to 28.60% due to increase in net sales or decrease in inventories.

Figure: 4.1.1

Sales and Inventory

4.1.2 Current ratio (CR)

Current ratio is the test of liquidity. It measures short-run debt paying ability of the STC. In order words, it measures the availability of current assets for meeting current liabilities. It is calculated by dividing current assets by current liabilities. Current assets are those assets which are expected to be converted into cash or consumed in the production of goods and services in normal course of time. Current liabilities are those liabilities which fall due for payment in the relatively short period of time.

$$CR\ X\frac{CA}{CL}$$

Table: 4.1.2

Current ratio

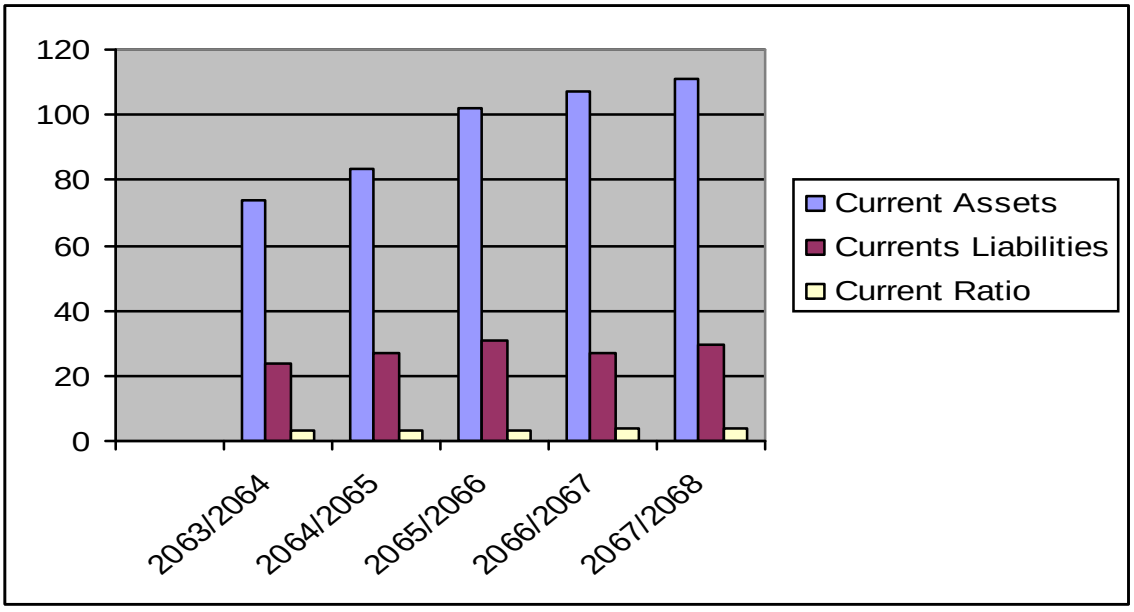
(In Crore Rs)

Fiscal Year	Current Assets	Currents Liabilities	Current Ratio
2063/2064	73.87	23.89	3.09
2064/2065	83.57	26.71	3.13
2065/2066	102.31	30.98	3.30
2066/2067	106.85	27.26	3.92
2067/2068	111.16	29.82	3.73

(Source: STC Annual Report)

The standard current ratio is equal to 2:1, i.e. current assets double the current liabilities. Higher current ratio indicates high liquidity and indicates ability to pay its current obligations in time as and when they become due. In table 4.1.2 comparatively, current ratio of STC is not satisfactory. The maximum current ratio is 4.42 in the fiscal year 2063/064 whereas the minimum current ratio is 0.99 in the fiscal year 2064/065. The current ratio up to the fiscal year 2059/060 was high. The current ratio increased from 3.09 to 4.42. But in the fiscal year 2066/0667current ratio dropped to 1.30 and then, it decreased to 0.99 in the fiscal year 2067/068. Over the study period the current ratio of STC was not satisfactory. These current ratios presented in the following figure no. 4.1.2

Figure no. 4.1.2
Current Assets and Current liabilities.



The above figure 4.1.2 shows the condition of current assets and currents liabilities of the STC. Current assets of STC increased slowly until 111.16 in the fiscal year 2067/2068

4.1.3 Quick ratio(QR)

Quick ratio measures the short-term liquidity of the firm but it emphasis the instant debt paying capacity of the firm. Liquidity refers to the ability of a concern to meet its current obligations as and when these become due. It is calculated by dividing liquid assets by current liabilities. Liquid assets include current assets less stock and prepaid expenses.

$$QR\ X\frac{QuickAsset}{CL}$$

Table: 4.1.3
Quick Ratio

(In Crore Rs)

Fiscal Year	Quick Assets	Currents Liabilities	Quick Ratio
2063/2064	67.90	119.01	0.57
2064/2065	74.87	165.42	0.45
2065/2066	76.32	186.50	0.41
2066/2067	85.01	182.23	0.47
2067/2068	92.88	189.20	0.49

(Source: STC Annual Report)

The quick ratio is very useful in measuring the liquidity position of the firm. The standard quick ratio is 1.1. Nearest ratio with standard one is 0.587 in the fiscal year 2063/2064, which indicates the ability of STC to meet its current liabilities in the time. This study shows the satisfactory ratio over the whole study period. Lowest quick ratio in the fiscal year 2065/066 is 0.41 and highest quick ratio is 0.57 in the fiscal year 2063/064.

Figure: 4.1.3
Trend Quick Assets , Current Liabilities and Quick Ratio

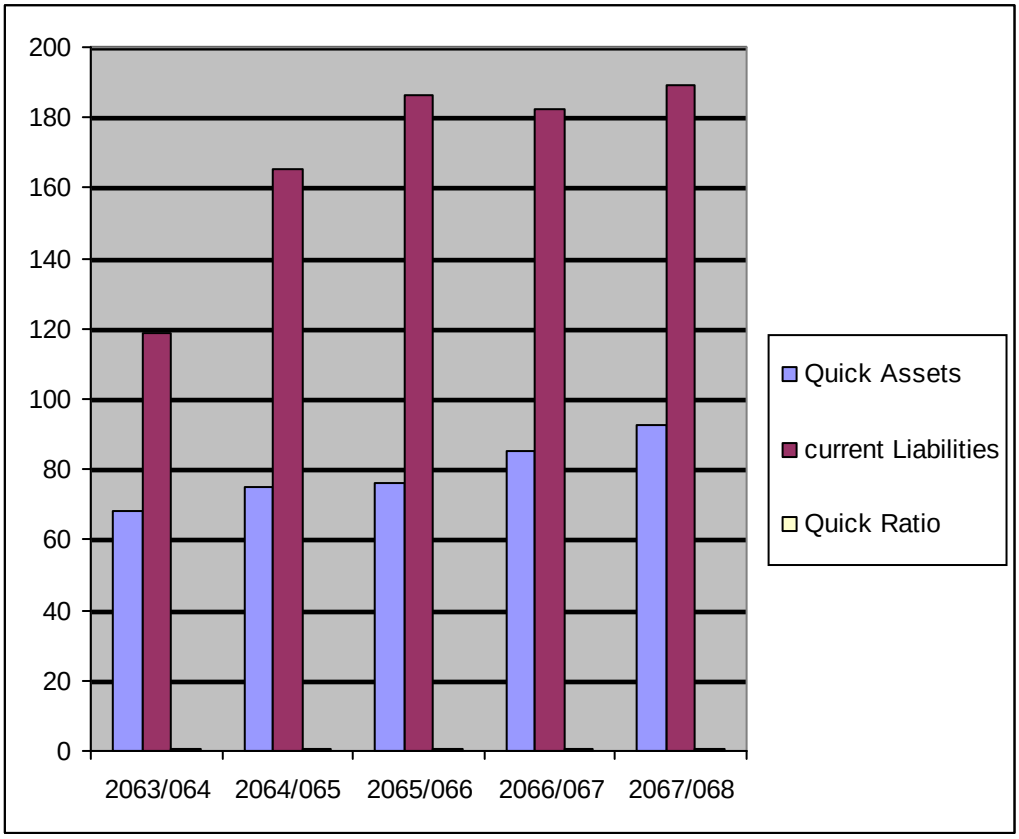
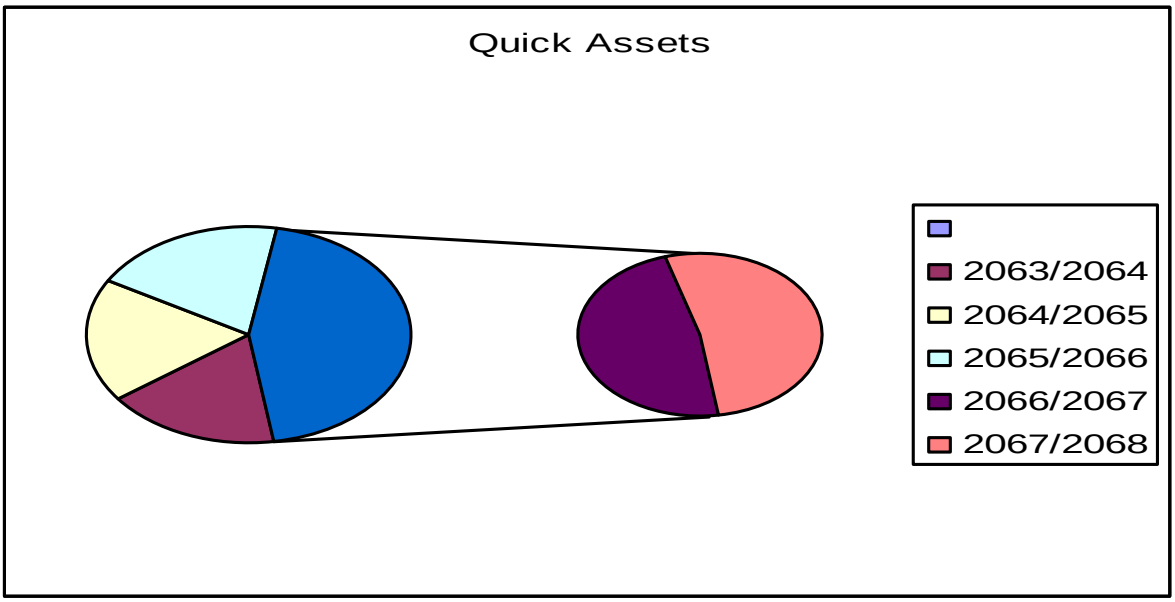


Table : 4.1.3
Current Ratio and Quick Ratio



4.1.4 Inventory to Total Assets Ratio

Inventories to total assets ratio shows the relationship between the inventories and assets. Here, inventories means closing inventories comprising salt, sugar, ghee, oil, rice, cement, etc and equipments and constructing machinery and spare parts. The total assets included the total fixed assets after deducting the depreciation and total current assets. Low inventories to total assets ratio is preferred as efficient inventory management. The low ratio means, the portion of inventories remaining low to assets.

$$Inventory\ to\ total\ Assets\ X \frac{TA}{Inventory}$$

Table: 4.1.4
Inventory to Total Assets Ratio

(In Crore Rs)

Fiscal Year	Inventory (Rs)	Total Assets (Rs)	Inventory to Total Assets
2063/2064	47.07	216.17	21.77
2064/2065	78.99	358.78	22.02
2065/2066	87.66	371.95	23.57
2066/2067	71.45	363.85	19.64
2067/2068	61.17	360.23	16.98

(Sources: STC annual reports)

The table 4.1.4, show lowest ratio of inventory to total assets was 16.98 in the fiscal year 2067/068. The maximum inventory to total assets ratio is 87.66in the fiscal year 2065/066. Assuming 2054/055 as base year, inventories ratio up to the fiscal year 2063/064 was reasonable while inventories ratio of the fiscal year 2064/065 was high and unusual. This table shows that inventories to total assets ratio were not consistent over the study period. In the fiscal year 2065/066 the ratio was decreased and then it started to increased

Table: 4.1.4

Trend of Quick Assets, current Liabilities and Quick Ratio

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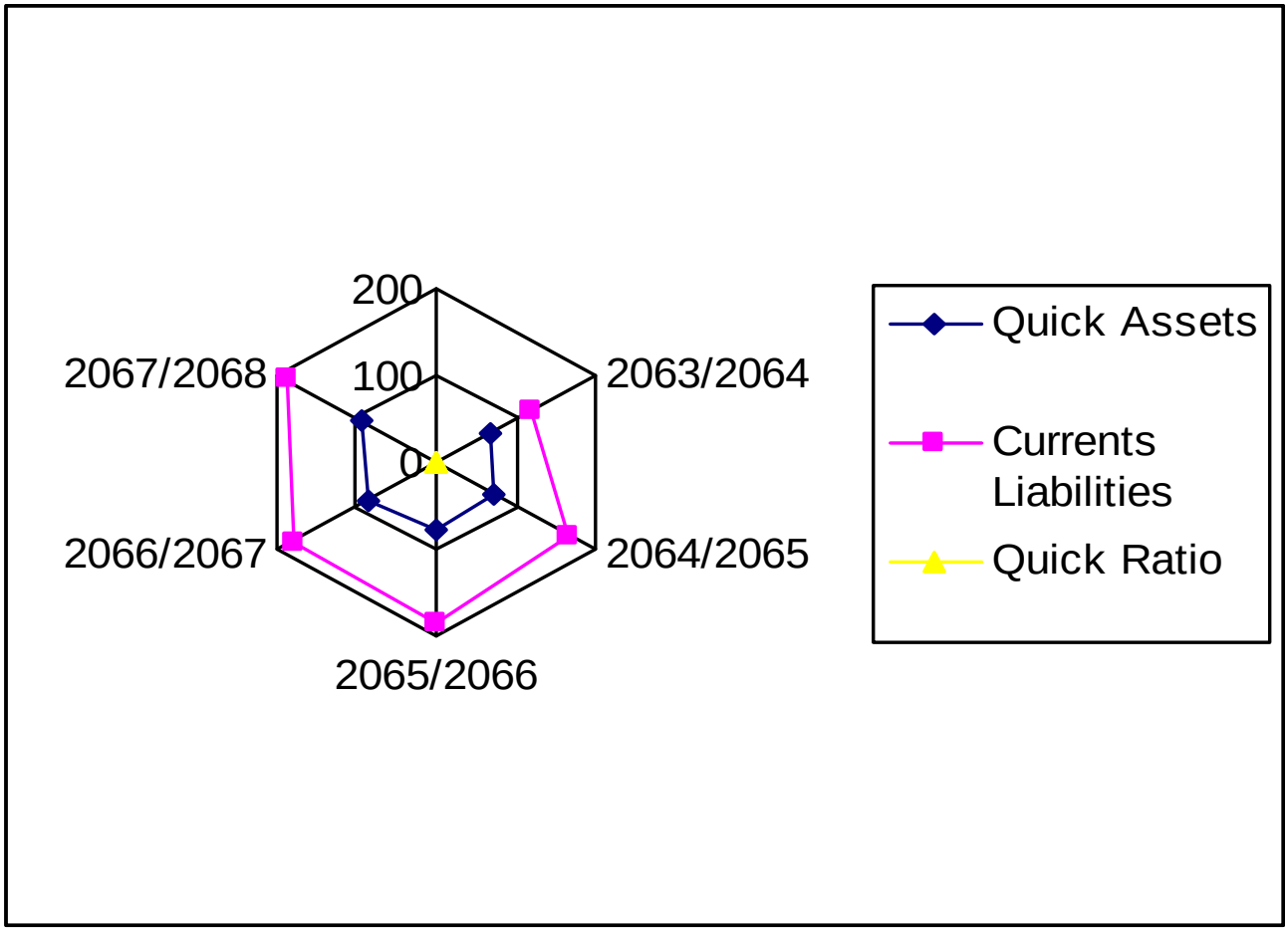


4.1.5 Inventory to Current Assets Ratio

This ratio shows the relationship of inventories to current assets. Current assets includes debtors, inventories, prepaid or advance expenses, deposits, staff loan and advance, different revenue expenses, cash in hand and cash at bank. High inventories to current assets of the corporation indicate the company's hold more inventories. The investment made in the inventory directly affects the profitability of the company. Therefore, low ratio in between the inventories to current assets is efficient inventory management.

$$Inventory\ to\ Current\ Assets\ Ratio\ X \frac{CA}{Inventory}$$

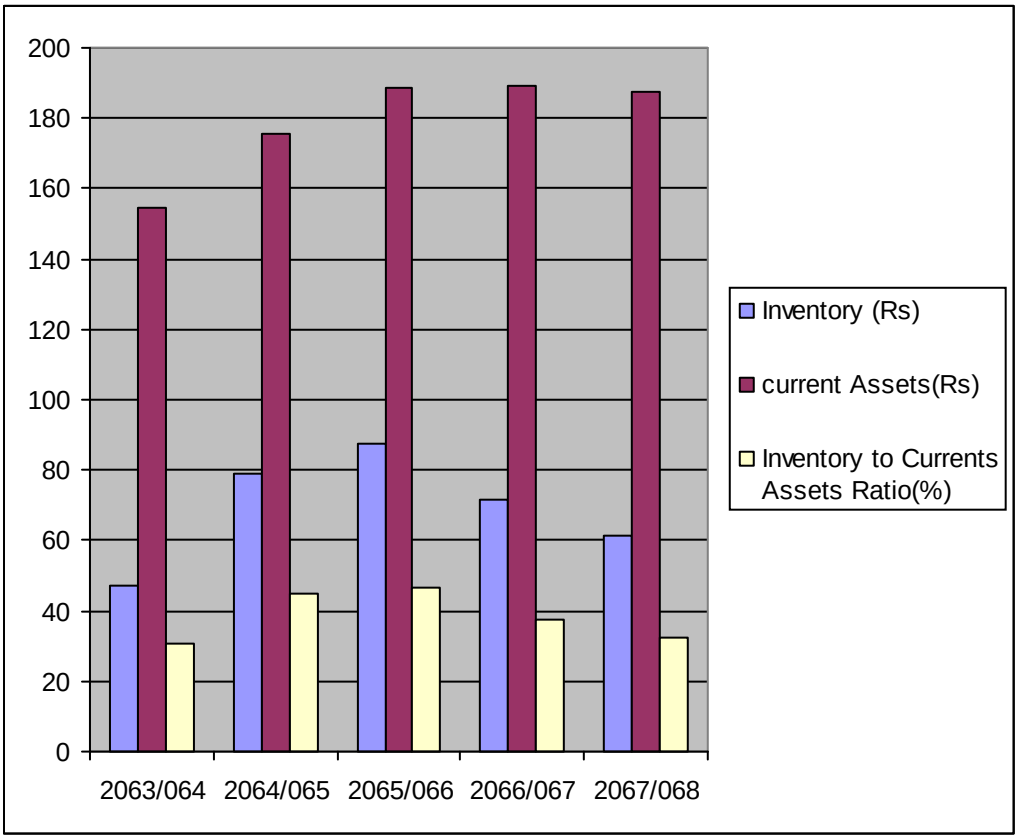
Table: 4.1.5
Inventory to Current Assets Ratio

(In Crore Rs)

Fiscal Year	Inventory(Rs)	Current Assets(Rs)	Inventory to Current Assets Ratio (%)
2063/2064	47.07	154.39	30.49
2064/2065	78.99	175.29	45.06
2065/2066	87.66	188.42	46.53
2066/2067	71.45	189.20	37.76
2067/2068	61.17	187.76	32.58

(Sources: STC annual reports)

Table: 4.1.5
Trend of Inventory to Current Assets Ratio



As the inventories to current assets ratios presented in the above table 4.1.5, the inventory management of STC was not efficient. There was more fluctuation in the ratio. The highest and lowest ratios of STC were 46.53 and 30.49respectively in the fiscal year of **2065/2066**and **2063/2064**. Taking ratio of 34.52 as basis ratio in the fiscal year **2063/2064**, the inventories to current assets ratio in the fiscal year **2067/2068** formed low and satisfactory, but the ratios of the rest years were higher. The ratios of the last two years had been decreased due to decreased in inventory level.

4.1.6 Inventory to Net Profit Ratio

Large quantity of inventories indicates low sales, and low sales generate low profit. This ratio represents the quantity of inventories to generate a good profit of the corporation. STC's accounting figures of net profit pattern for eleven years study period presented in the following table.

$$Inventory\ to\ Net\ profit\ Ratio \text{X} \frac{Netprofit}{Inventory}$$

Table: 4.1.6
Inventory to Net Profit Ratio

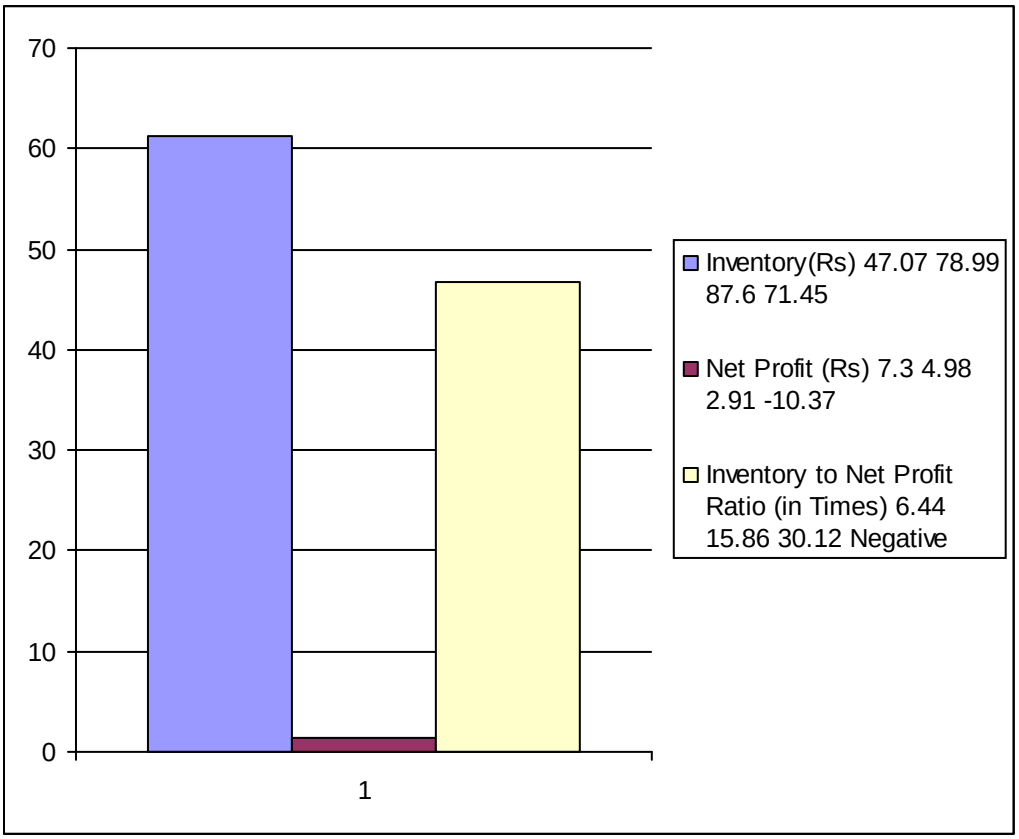
(In Crore Rs)

Fiscal Year	Inventory(Rs)	Net Profit(Rs)	Inventory to Net Profit Ratio (In times)
2063/2064	47.07	7.30	6.44
2064/2065	78.99	4.98	15.86
2065/2066	87.6	2.91	30.12
2066/2067	71.45	-10.37	Negative
2067/2068	61.17	1.31	46.70

(Sources: STC annual reports)

Table 4.1.6 shows that the corporation was suffered from loss in the fiscal year **2063/2064**and **2067/2068**. Highest profit about Rs.7.30 Crore earn by the corporation in the fiscal year **2065/2066**but inventories to profit ratio was only 6.44. This was the lowest inventory to net profit ratio over the period. Lowest profit of Rs.0.53 Crore in the fiscal year **2063/2064**shows the highest inventories to net profit ratio about 48.11.

Table: 4.1.6
Trend Inventory to Net Profit Ratio



4.1.7 Inventory Turnover Ratio (ITR)

ITR ratio used to measure the efficiency of sales of an organization. It is also known as stock turnover ratio or stock velocity ratio. Finished goods inventory was the cushion between sales and purchase for non-manufacturing organization. Level of inventory depends upon sales and purchase of the goods of the corporation. Detail calculation of cost of goods sold (COGS) and average inventories of the STC are shown in appendix **I** and **II** .

$$Inventory\ turnover\ Ratio\ \mathrm{X}\ \frac{COGS}{Average\ Inventory}$$

Table: 4.1.7
Inventory Turnover Ratio

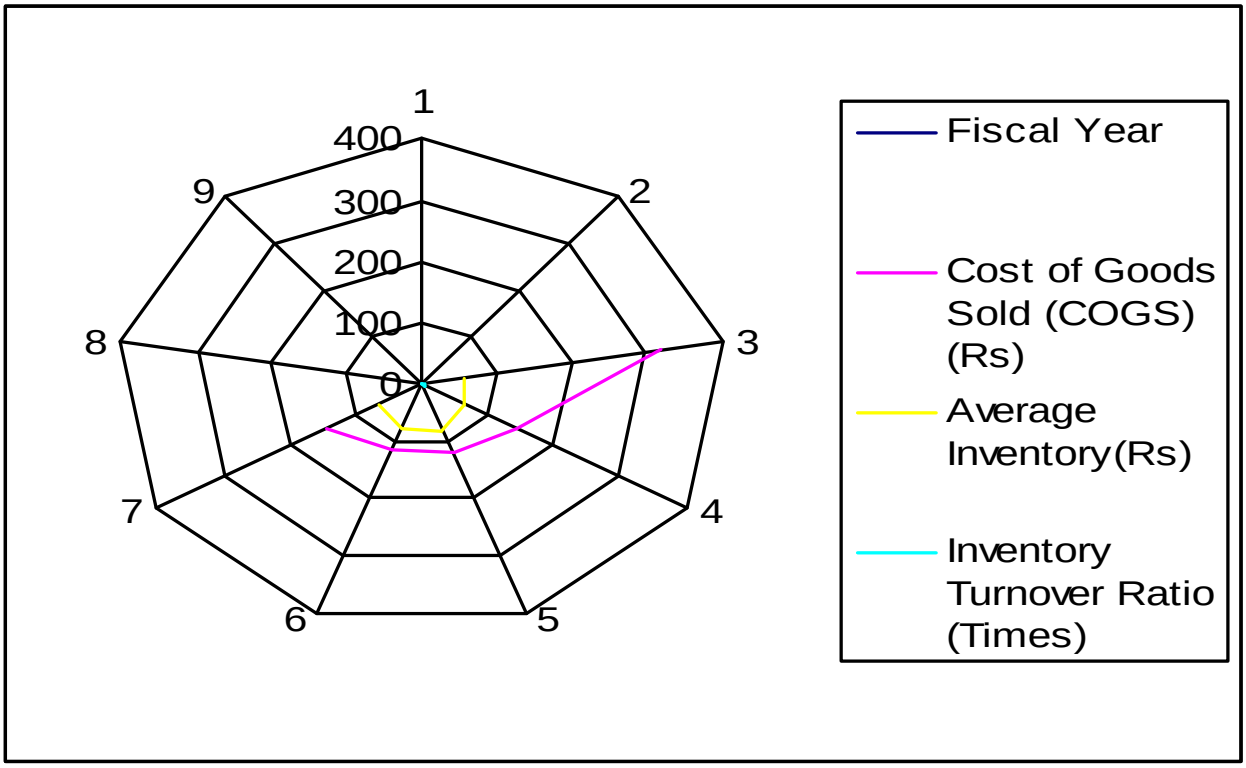
(In Crore Rs)

Fiscal Year	Cost of Goods Sold (COGS) (Rs)	Average Inventory(Rs)	Inventory Turnover Ratio (Times)
2063/2064	319.99	57.94	5.52
2064/2065	147.92	63.03	2.35
2065/2066	119.30	83.33	1.43
2066/2067	117.04	79.56	1.47
2067/2068	142.01	66.31	2.14

(Sources: STC annual reports)

The table 4.1.7 shows that the inventories turnover ratio was decreasing to the fiscal year **2067/2068**except the fiscal year 2060/061. In the fiscal year **2067/2068**, turnover ratio is very low i.e. 1.43 while maximum was7.30 in the fiscal year **2063/2064**. It represent more inventories were kept in the stock, unnecessary investment tied up on it. The average inventory level was decreased but inventories turnover ratio start to increasing in last three years and the COGS were increasing in these years. The inventories turnover ratio of the study period seems satisfactory. Computation of COGS and Average Inventory are shown in appendix **I** and **II** respectively.

Figure: 4.1.7
Trend of Inventory Turnover Ratio



As shown in figure 4.1.6 the inventory turnover ratios were fluctuating. In the fiscal year **2063/2064**this ratio was increased and then after the ratio was decreased till 3.44. Again in the fiscal year **2065/2066** turnover ratio was increased to 5.52 and then decreased. So the trend of the turnover ratio was not constant.

4.1.8 Inventory Holding Days (IHD)

IHD shows the period that the average inventories hold by the corporation. It represents the how many days the corporation holds the average inventories. The detail calculations of IHD of STC were shown below:

Table: 4.1.8
Inventory Holding Days

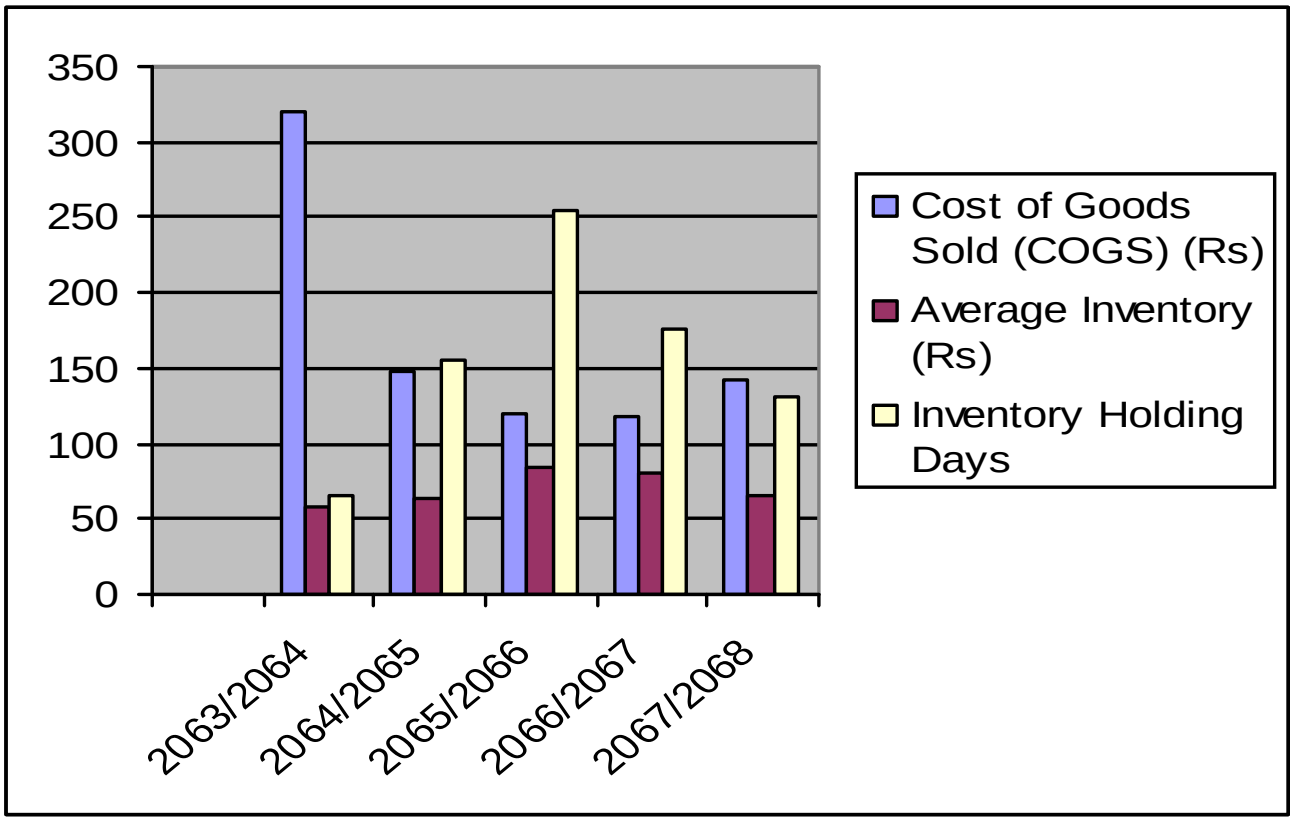
(In Crore Rs)

Fiscal Year	Cost of Goods Sold (COGS) (Rs)	Average Inventory (Rs)	Inventory Holding Days
2063/2064	**319.99**	**57.94**	**66.09**
2064/2065	**147.92**	**63.03**	**155.53**
2065/2066	**119.30**	**83.33**	**254.95**
2066/2067	**117.04**	**79.56**	**176.58**
2067/2068	**142.01**	**66.31**	**131.59**

Mean = 108.66
(Sources: STC annual reports)

From the 4.1.8 table, average Inventories Holding Days of STC from the fiscal year **2063/2064**to **2067/2068**was 108.66. In other words, the corporation holds average inventories 108.66 days in regards of mean in eleven fiscal years. From the fiscal year **2063/2064**to **2067/2068**, IHD had crossed the mean, whereas the rest of the years, IHD have remained below the mean. The minimum holding day period was 44.85 days in the fiscal year **2063/2064**and maximum holding days was 254.95 days in the fiscal year **2067/2068**, which was more than twice of average holding period 108.66. Maximum holding days increased the overall carrying cost of the corporation. So, was not good for the corporation. The trend of inventory Holding Period were presented in following figure no.4.1.8

Figure: 4.1.8
Inventory Holding Days



4.1.9 Relationship between Inventory and Cash Flow

Cash flow presents the state of the total cash inflow and outflow of the organization within certain period. Cash flow from operating activities shows the flow of cash to operate the organization regularly. Changes in inventory level directly affect the cash flow from operating activities. The following table 4.1.9 was prepared to found the affect of inventory in operating activities. Cash flow from operating activities before and after adjusting inventory was shown.

Table: 4.1.9
Effects of Changes of inventory in Cash Flow

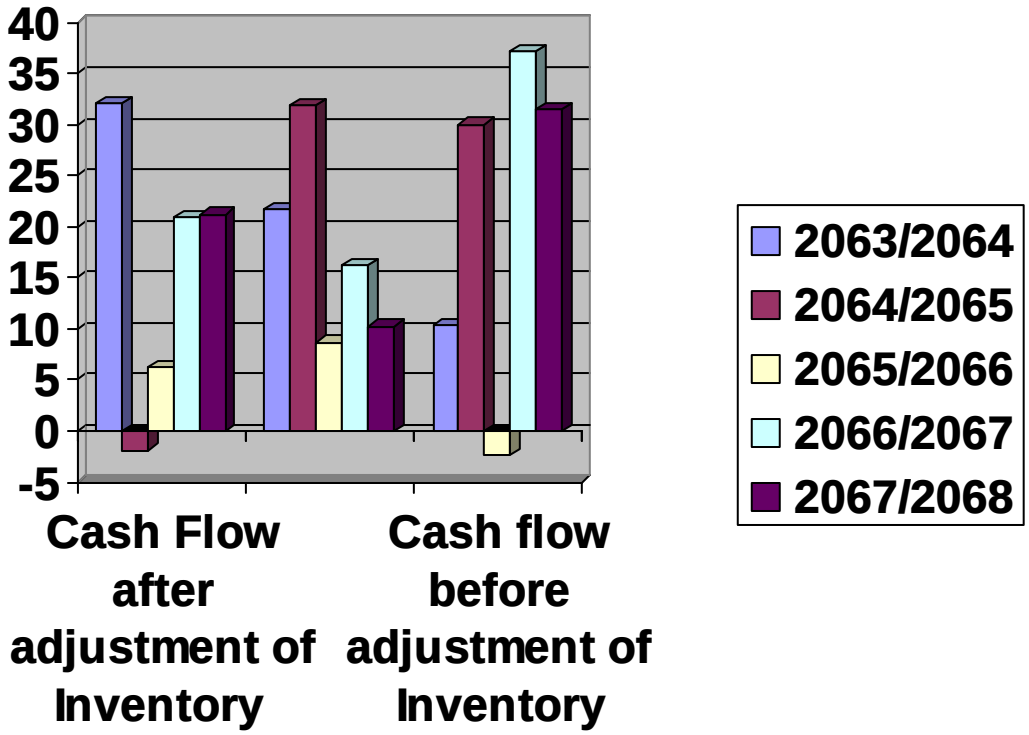
In Crore

Fiscal Year	Cash flow after adjustment of Inventory	Change in Inventory (Rs)	Cash flow before adjustment of Inventory
2063/2064	32.15	21.75 (Decrease)	10.40
2064/2065	-1.88	31.92 (Increase)	30.04
2065/2066	6.25	8.67 (Decrease)	-2.42
2066/2067	20.99	16.22 (Increase)	37.21
2067/2068	21.22	10.28 (Increase)	31.49

(Source: Annual report of STC)

In the above table, cash flows before adjusting changed level of inventory in the fiscal year **2063/2064**, **2064/2065**, **2063/2064** and 2062/063 were show maximum out flow beyond the cash balance. But, the cash flow after adjusting changed level of inventory in the fiscal year **2063/2064**, **2064/2065**, **2065/2066** and 2061/062 shows the negative cash balance. In the fiscal year **2065/2066**, 2057/058, 2060/061 and 2062/063, inventory level was decreased but in the remaining seven years the inventory level was increased. Increased inventory level decreased the cash balance and vice-versa. Highest cash flow before adjusting inventory was Rs. 37.21 Crore in the fiscal year 2063/064 whereas minimum cash flow was Rs1.83 in the fiscal year 2059/060. But highest cash flow after adjusting inventory was Rs.32.15 Crore in the fiscal year **2067/2068**and minimum cash flow was Rs.0.25 Crore in the fiscal year **2067/2068**Inventory and cash flow both were fluctuated severally over the study period.

Figure: 4.1.9
Relationship between Cash Flow and Inventory



(sources of Annual reports of Stc)

4.1.10 Correlation and Regression

Correlation may be defined as the degree if linear relationship existing between two or more variable. Correlation coefficient measures the degree of relationship between two or more variables, whereas the regression analysis was used to estimate the likely value of one variable from the known value of the other variable. It was specially used in business and economics to study the relationship between two or more variables that were related causally. Regression analysis is a mathematical measure of the average relationship between two or more variables in terms of original units of the data. The

4.1.10.1 Regression and Correlation Analysis of Inventory and Net Sales

On the basis of variable derived from the calculation, sales and inventories of foods, agriculture goods, fuel, lubricants or tyres and tubes, machineries, construction goods and others were obtained. For the analysis, inventory was assumed as dependent variable which was denoted by „Y‟ and the net sales as independent variable which was denoted by „X‟ variable. The regression equation of „Y‟ on „X‟ which was used to describe the variation in the value of „Y‟ for given changes in the value of „X‟.

Table :- 4.1.10.1

Calculation of Regression and correlation Analysis of Inventory and Net Sales

Inventoty (Y)	Net sales (X)	Y^2	X^2	XY
25.50	173.85	650.25	30223.82	4433.18
16.55	184.24	273.90	33944.38	3049.17
28.99	158.05	840.42	24979.80	4581.47
19.99	174.32	399.60	30387.46	3484.66
37.07	187.59	1374.16	35190.01	6953.96
68.81	246.10	4734.82	60565.21	16934.14
47.07	389.89	2215.56	152014.2	16352.12
78.99	219.39	6239.42	48131.97	17329.62
87.66	185.06	7684.28	34247.20	16222.36
71.45	191.62	5105.11	36718.22	13691.25
61.17	213.90	3741.77	45753.21	13084.26
Y X543.25	X X2324.01	Y^2 X33259.33	X^2 X532155.55	XY X118116.6

Let Regression equation Y on X be, $Y = a + bX$..... (I)

Then two normal equations

$\Sigma Y = na + b\Sigma X$..... (II)

$And,\ \Sigma XY = a\Sigma X + b\Sigma X2$..... (III)

Substituting the above calculated value in equation number (II) and (III)

$Or, 543.25 = 11a + b2324.01$..... (IV)

$118116.6 = a2324.01 + b532155.5$..... (V)

Now, multiplying equation no (IV) by 211.28 and then subtracting to equation no (V)

$114777.86 = a2324.01 + b491016.83$

$118116.60 = a2324.01 + b532155.5$

$-3338.64 = -b41138.67$

$Or,\ b = \frac{-3338.64}{-41138.67}$

Or, $b = 0.08$

Substituting the value of 'b' in equation no (IV)

$543.25 = a11 + 0.08 * 2324.01$

$Or, 11a = 543.25 - 185.92$

$Or, a = \frac{357.33}{11} = 32.48$

According to this calculation the following results to be obtained:

$a = 32.48, and\ b = 0.08$

Substituting the values of 'a' and 'b' in equation (I) then the regression line is

$Y = 32.48 + 0.08X$.

The regression result+ estimated in this model was based on the observation of the eleven fiscal years from **2063/2064**to 2067/068 The regression on current year inventories and net sale produce the following equation . The above regression represents that there was positive relationship between net sales and closing inventory. The constant value of 32.48 indicates that the value of inventory remains constant irrespective of changes in current year net sales. While, coefficient 0.08 indicates that the changes in Rs.1 of sales results the change in Rs.0.08 of closing inventory of the corporation. To analyse the relationship between the net sales and inventory, Karl Pearson's correlation co-efficient was used. The coefficient of correlation and probable error between net sales and inventories were + 0.028 and + 0.20 respectively. The value of correlation 'r' was + 0.028, somehow far to + 1. So, it seems that there was low degree of positive relationship between net sales and inventories of STC. Increased in inventory would increase in sales and vice versa. But considering probable error, it was found that the calculated value of 'r' is less than Probable Error (PEs). So the value of 'r' was insignificance and there were no evidence of correlation between net sales and inventories. Proportionate increase in sales would not increased in inventory. The detail calculation of co-relation of coefficient, mean, standard deviation, CV and probable error were shown in appendix **III.**

4.1.11 Trend Analysis

In this section, It is tried to explain the trend of inventories with the different variables in different fiscal years.

4.1.11.1 Trend Analysis of Net Sales and Inventory

The following table represents the net sales and inventories of STC through the fiscal year 2063/2064 to 2067/068.

Table: 4.1.11.1
Net Sales and Inventory

(In Crore Rs)

Fiscal Year	Net Sales(Rs)	Inventory (Rs)
2063/2064	389.89	47.07
2064/2065	219.39	78.99
2065/2066	185.06	87.66
2066/2067	191.62	71.45
2067/2068	213.90	61.17

(Sources: STC annual reports)

Table 4.1.11.1 shows that the level of total net sales and inventories of different fiscal years. Both of them were changing over in the same pattern. Net sales were increased to 184.24 from 173.85 in the fiscal year **2063/2064**and then started to decreased and increased severally. The table depicted net sales were upward until the fiscal year **2064/2065**but then after it was decline. On other hand same fluctuating trend occurs in inventory level too. Level of inventory was increased and decreased severally. Inventory was slightly decline in the fiscal year **2064/2065**but go up till the fiscal year **2066/2067**and again it started to decline.

Figure : 4.1.11.1
Net Sales and Inventory

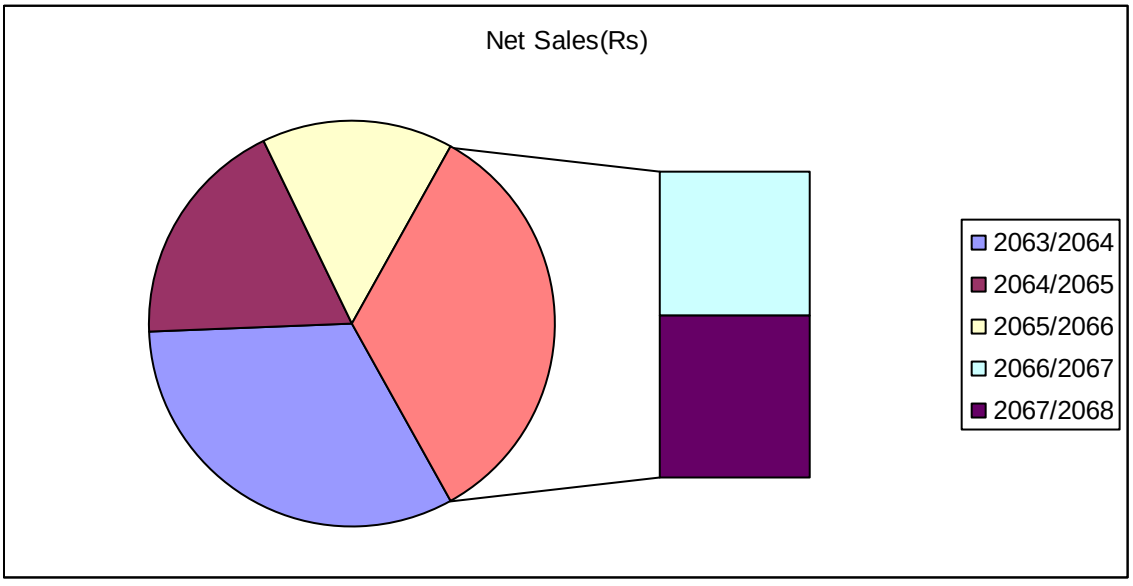


Table : 4.1.11.2
Relation between of Net Sales and Inventory

Statistical Tool	Net Sales	Inventory
Mean	211.27	49.39
Standard Deviation(S.D.)	61.17	24.18
Co-efficient of Variation(C.V)	28.95	48.96

Table 4.1.11.2 shows mean, standard deviation and co-efficient of variation of net sales and inventories. Mean of net sales and inventories in the eleven fiscal years were 211.27 and 49.39, standard deviation were 61.17 and 24.18 and coefficient of variance were 28.95% and 48.96% respectively. The co-efficient of variance of inventories was higher than the coefficient of variance of net sales. So, the variability of inventories was higher than the net sales or there were less uniformity and consistency of inventory.

4.2 Major Findings

Major findings from the research are explained below.

i) The value of correlation and probable error between sales and inventory as +0.028 and was + 0.20. It seems that there was low degree of ositive relationship.

ii) Mean of inventory to current assets ratio was 33.45%. It indicates that he company had not been adopting appropriate inventory policy.

iii) Generally a current ratio of 2:1 is considered satisfactory. Over the study eriod current ratio of STC was not satisfactory. From the fiscal year 054/055 to the fiscal year 2063/064, the current ratio was more than tandard ratio and it was less han standard ratio in the remaining fiscal ear. It was not preferable. So, the solvency position of STC was not etter from the fiscal year 2064/065 to the fiscal year 2064/065. The highest CR is 4.42 in the fiscal year 2063/064 and lowest CR is 0.99 in he fiscal year 2064/065. CR was fluctuated between 1.30:1 and 0.99:1.

iv) Quick ratio of the STC from the fiscal year 2054/055 to the fiscal year 059/060 was higher than the standard quick ratio 1:1, whereas remaining year shows lower ratio than standard. Higher or lower than tandard ratio was unfavorable for STC. Highest QR was 2.33 in the iscal year 2057/058 lowest QR was 0.41 in the fiscal ear 2062/063. ver the study period quick ratio of STC was not satisfactory.

v) TAR was 16.21 in the fiscal year 2055/056. Total assets of STC were ncreasing to Rs.371.95 till the fiscal year 2063/064, and then started to ecreased to 360.23 in he year 2064/065. But in the last two year, ITR as decreasing to 16.98. Inventories to total assets ratio were not onsistent over the study period.

vii) Net profit of the organization was not satisfactory. Company faced the oss amounted Rs. 1.25 crore and Rs. 10.37 crore in the fiscal year 056/057 and 2063/064 respectively.

vi) Inventory turnover ratio was fluctuating severally over the study period. omparing with ITR of 6.72 in the fiscal year 2054/055, the ITR was ecreasing to 1.43 times from the fiscal year 2056/057 to 2062/063. hose ratios were represented unfavorable and inefficient in inventory anagement. But in the last two year ITR was increasing to 2.78.

vii) Mean IHD was 108.66. From the fiscal year 2061/062 to 2064/065 the HD crossed the mean IHD whereas in the rest years IHD remained elow the mean. Highest IHD was 254.95 in the fiscal year 2062/063 nd lowest IHD was 44.85 in the fiscal year 2055/056.

viii) Mean of net sales and purchase were 211.27 and 160.56 which were igher than mean of inventory 19.20. S.D of net sales, purchase and nventory were 61.17, 51.75 and 24.18 respectively. But the co-efficient f variation of inventory was 8.15 higher than CV of net sales and urchase 28.95 and 32.23 respectively. So, the net sales and purchase ere more uniformity and consistency. And variability of urchase was igher than net sales.

ix) In case of net profit mean and S.D. were 1.36 and 4.39% which were ower than mean and S.D of inventory. Where as co-efficient of ariation of net profit was321.89 very higher than CV of inventory. So, he uniformity and consistency of net profit was lower.

x) Cash flow from operating activities after adjusting inventory shows the egative cash balance by Rs.5.95, Rs. 29.91 and rs.1.88 in the fiscal year 054/055, 2059/060 and 2061/062. Cash balance was started to ncreased from Rs.6.25 to Rs.21.22 crore in the fiscal year2064/065 due o decrease in inventory to Rs. 10.28 crore in the fiscal year 2064/065.

xi) The regression equation of inventory on net sales is Y = 32.48 + 0.08X. quation shows the positive relationship between inventory and net ales. There is low degree of positive relationship between net sales and nventory with the value .028. And the correlation between purchase nd inventory is 0.10 and correlation of nventory with cash flow is .0079 which is far from +1. So, these values represent the low degree f relation.

xii) The correlation value between purchase and sales is 0.92. This epresents the high degree of relationship. But the relationship between nventory and net profit show the very low degree of positive relation ith correlation value of 0.0057.

xiii) Coefficient of correlation between net profit and inventory were 0.0057 hich as far from +1. So, there was low degree of positive relationship etween net profit and inventory.

xvi) Correlation coefficient and probable error between inventory and urchase were 0.0065 and 0.203 respectively, which shows the low egree of correlation coefficient between inventory and purchase.

xvi) Calculated correlation value of 0.0079 shows the low degree of positive elationship between cash flow and inventory. Probable error (6PE) was .2 which was higher than calculated value „r" i.e. 0.0079 indicate that here were no evidence of correlation between cash flow and inventory.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Inventory management is one of the most important functions in any organization. Without effective and efficient inventory management no organization can achieve its goal. Success of any enterprises basically depends on the efficiency and effectiveness of systematic management. Inventory management is the most important part of trading company. The Company used to invest in inventory. A firm cannot achieve its goal unless inventories are controlled effectively. Inventory constitutes most significant part of current assets.

The basic objective of this study is to examine the inventory management system practiced by the company. Inventory management system of STC is neither effective nor scientific. Therefore, all these activities lead to increase total cost of the company.

The specific objectives of the study are to examine the practice of inventory management (i.e. procurement or acquisition of goods, storing of goods, issuing the goods from stores etc), to analyze the inventory levels and its trend in STC and to analyze relationship of inventory with net sales, net profit, and purchases. This study is one of the new studies, it attempted to know the inventory management and its affects on cash flow of STC.

Secondary data from annual report of STC were collected to meet the objectives. The statistical tools like mean, standard deviation, coefficient of variation, correlation, regression, probable error and trend analysis with table and figure as required were used to analyse the available data. Similarly, the financial tools and techniques like financial ratio, inventory turnover ratio and inventory holding days were used.

5.2 Conclusion

On the basis of analysis of data and information collection from Salt Trading Corporation, the following conclusions have been drawn. The main objectives of the study to analyse the condition of inventory management and its relationship with variables like net sales, net profit, purchase and the affects of inventory in cash flow of STC. To fulfill the objectives of the study the necessary data are collected from secondary sources. STC applied EOQ technique of inventory management; however it is implemented unsystematically and ineffectively. Quick ratio and current ratio of the corporation is not satisfactory because the ratios are below standard. Most of the current assets cover the inventory. So, the liquidity of the organization is very low and cash is blocked by investing in the inventory. Likewise the inventory to total assets ratio are not consistent over the study period and ITR is fluctuating severally over the study period. Those ratios are represented unfavorable and inefficient in inventory management. But in last two years the ITR is increasing slowly and efficiency of inventory management is increasing. Net sales and purchases are more uniformity and consistency than that of inventory because the CV of inventory is higher than net sales and purchase. But the lower CV of net profit represents the lower uniformity and consistency.

Correlation between net sales and inventory show lower degree of positive relationship. Proportionate changed in sales would not changed in inventory. There are lower correlation between net profit and inventory but the correlation between sales and purchase is higher. The proportionate change in sales results the proportionate change in purchase spontaneously. From the regression analysis, it is found that there is positive relation between inventories and net sales, net profit, cash flow and purchases. There is also positive relationship between net sales and purchase. Trend of net sales, purchase and inventories are fluctuated in the same pattern while the coefficient of variance of inventories is higher than the co-efficient of variance of net sales and purchase. But the coefficient of the net profit is higher than of inventory. And mean and standard deviation of profit is lower. There are no evidence of correlation between cash flow and inventory also. Change in inventory directly affect on the cash flow from operating activities. Increases in inventory cause decreases in cash inflow and decreases in inventory causes increases in cash flow.

5.3 Recommendation

The efficient management is essential to achieve the objectives of STC. The management of inventory in STC is not only necessary but compulsory for the better performance of the organization. On the basis of study, the following recommended were made for the betterment of the organization.

- Purchasing plan should be prepared with the proper co-operation and coordination among the planning, purchasing, storing, marketing and sales department to avoid excessive investment on inventory.

- STC should give more attention to the inventory management. The company should manage the inventory according to the sales.

- The corporation must apply scientific and effective inventory management system.

- The corporation must use EOQ model to determine order size, which minimize cost of organization and increase the profitability.

- The purchase and sales were done unsystematically. So, the corporation must follow the effective purchase and sales policy.

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APPENDIX

Appendix I

Computation of Cost of Goods Sold

Opening Inventory	Purchase	Closing Inventory	Cost of Goods Sold
22.45	144.07	25.5	141.02
25.5	144.48	16.55	153.43
16.55	137.93	28.99	125.49
28.99	133.16	19.99	142.16
19.99	154.08	37.07	137
37.07	213.81	68.81	182.07
68.81	298.25	47.07	319.99
47.07	179.84	78.99	147.92
78.99	127.97	87.66	119.3
87.66	100.83	71.45	117.04
71.45	131.73	61.17	142.01

Note: Cost of Goods Sold = Opening Inventory + Purchase – Closing Inventory

Appendix II

Calculation of Mean, Standard Deviation and Coefficient of correlation of Net Sales and inventory

Sales (Y)	Inventory (X)	X^2	Y^2	XY
173.85	25.5	650.25	30223.82	4433.175
184.24	16.55	273.9025	33944.38	3049.172
158.05	28.99	840.4201	24979.8	4581.87
174.32	19.99	399.6001	30387.46	3484.657
187.59	37.07	1374.185	35190.01	6953.961
246.1	68.81	4734.816	60565.21	16934.14
389.89	47.07	2215.585	152011.2	18352.12
219.39	78.99	6239.42	48131.97	17329.62
185.06	87.66	7684.276	34247.2	16222.36
191.62	71.45	5105.103	36718.22	13691.25
213.9	61.17	3741.769	45753.21	13084.26
$\sum Y =$ 2324.01	$\sum X =$ 543.25	$\sum X^2 =$ 33259.33	$\sum Y^2 =$ 532155.5	$\sum XY =$ 118116.6

Mean of sales $= \frac{\sum Y}{n} = \frac{2324.01}{11} = 211.27$

Mean of Inventory $= \frac{\sum X}{n} = \frac{543.25}{11} = 49.20$

S.D. of Inventory $= \sqrt{\left\{\frac{\sum X2}{n} - \left(\frac{\sum X}{n}\right)2\right\}} = \sqrt{\left\{\frac{33259.33}{11} - \left(\frac{543.25}{11}\right)2\right\}} = 61.17$

S.D. of Sales $= \sqrt{\left\{\frac{\sum Y2}{n} - \left(\frac{\sum Y}{n}\right)2\right\}} = \sqrt{\left\{\frac{532155.5}{11} - \left(\frac{2324.01}{11}\right)2\right\}} = 24.18$

Coefficient of variation of sales (C.V) $= \frac{S.D\ of\ sales}{Mean\ of\ sales} * 100 = \frac{24.18}{211.27} * 100 =$ 28.95%

Coefficient of variation of inventory (C.V) $= \frac{S.D\ of\ Inventory}{Mean\ of\ Inventory} * 100 = \frac{61.17}{49.20} *$ 100 = 48.15%

We know that,

The correlation coefficient between two variable is given by

$$\text{Correlation (r)} = \frac{n \quad XY - \quad X \quad Y}{\sqrt{n \quad X^2 Z(\quad X)^2}\sqrt{n \quad Y^2 Z(\quad Y)^2}}$$

$$= \frac{11 \mid 118116.6 Z2324.01 \mid 543.25}{\sqrt{11 \mid 532155.5 Z f2324.01 Å}\sqrt{11 \mid 33259.33 Z f543.25 Å}}$$

$$X \frac{1299282.6 Z1262518.43}{\sqrt{5853710.5 Z5401022.48}\sqrt{365852.63 Z295120.56}}$$

$$= \frac{3676417}{\sqrt{45268802}\sqrt{7073207}}$$

$$= \frac{3676417}{67\angle 82 \times 265.95}$$

$$= \frac{3676417}{178936479}$$

$$= 0.205$$

For the test of significant

We know that,

$$P.E.(r) = 0.6745 \times S.E.(r)$$

$$= 0.6745 \times \frac{1-r^2}{\sqrt{n}} 0.6745$$

$$= 0.6745 \times \frac{1-(0.205)^2}{\sqrt{11}}$$

$$= 0.6745 \times \frac{1-0.042025}{3.3166}$$

$$= 0.6745 \times \frac{0.9579}{3.3166}$$

$$= \frac{0.6461}{3.3166}$$

$$= 0.195$$

I. /r/ > 6xP.E.(r) for all significant.

II /r/ < P.E . (r) for no evidence for significant.

Both of the above condition doesn't exist .So, it has no evidence for significant.

Appendix III

Calculation of Mean, Standard Deviation and Coefficient of correlation of Purchase and inventory

Purchase(Y)	Inventory (X)	X^2	Y^2	XY
144.07	25.5	650.25	20756.16	3673.785
144.48	16.55	273.9025	20874.47	2391.144
137.93	28.99	840.4201	19024.68	3998.591
133.16	19.99	399.6001	17731.59	2661.868
154.08	37.07	1374.185	23740.65	5711.746
213.81	68.81	4734.816	45714.72	14712.27
298.25	47.07	2215.585	88953.06	14038.63
179.84	78.99	6239.42	32342.43	14205.56
127.97	87.66	7684.276	16376.32	11217.85
100.83	71.45	5105.103	10166.69	7204.304
131.73	61.17	3741.769	17352.79	8057.924
$\sum Y$ = 1766.15	$\sum X$ = 543.25	$\sum X^2$ = 33259.33	$\sum Y^2$ = 313033.6	$\sum XY$ = 87873.67

Mean of Purchase $= \frac{\sum Y}{n} = \frac{1766.15}{11} = 160.56$

Mean of Inventory $= \frac{\sum X}{n} = \frac{543.25}{11} = 49.20$

S.D. of Inventory $= \sqrt{\left\{\frac{\sum X2}{n} - \left(\frac{\sum X}{n}\right)2\right\}} = \sqrt{\left\{\frac{33259.33}{11} - \left(\frac{543.25}{11}\right)2\right\}} = 61.17$

S.D. of Purchase $= \sqrt{\left\{\frac{\sum Y2}{n} - \left(\frac{\sum Y}{n}\right)2\right\}} = \sqrt{\left\{\frac{313033.6}{11} - \left(\frac{1766.15}{11}\right)2\right\}} = 51.75$

Coefficient of variation of Purchase (C.V) $= \frac{S.D\ of\ Purchase}{Mean\ of\ Purchase} * 100 = \frac{51.75}{160.56} * 100 = 32.23\%$

Coefficient of variation of inventory (C.V) $= \frac{S.D\ of\ inventory}{Mean\ of\ inventory} * 100 = \frac{61.17}{49.20} * 100 = 48.15\%$

We know that,

The correlation coefficient between two variable is given by

$$\text{Correlation (r)} = \frac{n \quad XY - \quad X \quad Y}{\sqrt{n \quad X^2 Z(\quad X)^2}\sqrt{n \quad Y^2 Z(\quad Y)^2}}$$

$$= \frac{11 \mid 87873.67 Z543.25 \mid 1766.15}{\sqrt{11 \mid 33259.33 Z543.25}\sqrt{11 \mid 313033.6 Z1766.15}}$$

$$= \frac{966610.37 Z959460.987}{\sqrt{369852.63 Z295120.56}\sqrt{3443369.6 Z3119285.823}}$$

$$= \frac{7149.383}{\sqrt{70732.07} \quad \sqrt{324083.77}}$$

$$= \frac{7149.383}{265.955 \mid 569.284}$$

$$= \frac{7149.383}{151403.926}$$

$$= 0.04722$$

$$P.E.(r) = 0.6745 \times S.E.(R)$$

$$= 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-(0.0472)^2}{\sqrt{11}}$$

$$= 0.6745 \times \frac{1-0.002228}{3.317}$$

$$= 0.6745 \times \frac{0.9978}{3.317}$$

$$0.2029 > r$$

= Hence , /r/ < 0.2029 . So,It has no evidence for significant

QUESTIONNAIRE

This questionnaire is designed to avail the information relating to **INVENTORY MANAGEMENT AND IT'S EFFECTS NSH FLOW OF SALT TRADING CPORATION**. Dissertation required to the MBS course to be submitted to the Tribhuvan University. The information to be provided here will be kept secret. I would be very much grateful for your kind co-operation.

Instruction: Please fill any one or more than one boxes for the following questions.

1. What are the basic reasons for keeping inventory in the Company?

(a) To maintain independence of operations. ☐
(b) To meet variation in product demand/buffer stock. ☐
(c) To allow flexibility in production schedule. ☐
(d) To provide safeguard for variation in raw material delivery. ☐

2. Which forms of inventory do maintain in your company ?

(a) Raw material. ☐
(b) Work in process. ☐
(c) Finished goods. ☐
(d) All types. ☐

3. Who determine the inventory in the company?

(a) Procurement department. ☐
(b) Production department. ☐
(c) Account department. ☐

4. What is the method of inventory determining?

(a) Personal judgment method. ☐

(b) Mathematical and statistical method. ☐

5. Does the company face any problem in inventory management?

(a) Yes ☐

(b) No ☐

6. If yes, what types of problem faced by the company?

(a) Determining the size of inventory. ☐

(b) Disbursement and procurement of material. ☐

(c) Proper storage facility. ☐

(d) Inventory policies. ☐

7. Has the company apply EOQ model?

(a) Yes ☐

(b) No ☐

8. Has the company apply ABC technique for storage of material?

(a) Yes ☐

(b) No ☐

9. If no what are the limitation of applying EOQ and ABC model?

(a) Lack of practices ☐

(b) Lack of knowledge ☐

(c) Nature of Raw material. ☐

10. Does the company calculate cost of inventory?

(a) Yes ☐

(b) No ☐

11. What do you think, is the relation between cost of inventory and Profit?

(a) Positive ☐

(b) Negative ☐

(c) No-relationship. ☐

12. Does the company maintain desirable Safety Stock?

(a) Yes ☐

(b) No ☐

13. Do the transportation and other strike affect the inventory?

(a) Yes ☐

(b) No ☐

14. What suggestion do you make improve the inventory management in the manufacturing company?

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