

CHAPTER - I

INTRODUCTION

1.1 Background of the study

Public enterprises are those which are managed, controlled and owned by government to provide goods or service to the people at fair price. In such enterprise, government owns half or more than half of total shares. Public enterprises are established not only for commercial purpose but also for public welfare and thus are strong means of socio-economic development of nation. Standing on that fundament, public enterprise has to maintain proper balance between profit and service.

Different scholars, agencies and government have defined the term 'public enterprise' differently to suit their own respective situations. According to Hanson, "public enterprise means ownership and operation of industrial, agricultural, financial and commercial undertakings". In the words of World development report 1998, "State owned enterprises are financial autonomous and legally distinct entities wholly or partially owned by government".

UN has defined public enterprise as "those organizations, namely governmental enterprise and public corporation which are entirely or mainly owned and /or controlled by public authorities consisting of establishment which by virtue of their kind of activities, technology and mode of operation are classified as industries". (Pandey, 1994).

Nepal is exercising mixed economic policy for its economic prosperity. It creates the co-existence of private and public sector. Despite many private enterprises, they are only oriented to generate profit and ignore social welfare, compel the government to reserve some enterprises by full or partial ownership. The co-existence of both private and public sector is necessary and useful for achieving the twins' objectives of social and economic development, envisaged in national level policy. Mainly, the role of PEs has been in basic infrastructure, defense sector, industrial estate public utilities, and commercial sector, trading and sectors. PEs are important to create industrial bases in the country, to provide better goods/service to the people at reasonable price,

to generate employment opportunities, to collect government revenue, to mobilize the national resource into productive uses and to fulfill the government plans and objectives. PEs has helped to boost the standard of living, to balance regional development, to utilize resource optimally, to contribute import substitution and export promotion. Therefore, the role of PEs in developing countries like Nepal is the most important for socio-economic development of people, enterprise and the nation. No nation in the world is without public enterprises. (*Gupta;1992*).

Public enterprises were established in service, social service, industrial, trading, finance and other sectors for to develop infrastructure and provide basis services to the people. The evolution of PEs in the world has no longer history. During the 18thcentury, a concept was developed like problems of poverty and unemployment may be solved by the government intervention in the economy. In that period, most of the developing country had adopted the laissez fair policy in the economy. After intervention by the government, the economy was rapidly increased during the 20th century. The concept of the PEs has been developed from the “socialist though” after the great depression of 1929. The main impact to the PEs was the 2nd world war which had played vital role to the increasing rate for the development of PEs in the context of Nepal. Industrialization has started very late then other developing countries. (*Mishra; 2003*)

Inventory is the balance materials of trading houses. Inventory can be either raw material of finished goods ready for sales or good in the manufacturing process. So the inventory recorded as assets on a company. When the goods are purchased by the trading house 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 house to reduce the cost of store. So, high inventory is not good sign because it involves a high cost with store of the extra inventory of the trading houses. (*Singha; 2005*)

Modern concept of inventory management to be traced to 1915 to 1922 AD which developed an economic lot size equation that minimize sum of holding and carrying cost where the demand was known and constant. ‘Inventories form a link between

production and sales of product. The inventory exists in manufacturing and non-manufacturing organization. In manufacturing organization there are four types of inventories. First is raw material, to purchased and store for future production. Second work-in-progress refers semi-manufactured products. They represent products that need more work before they become finished production for sale. Third goods inventories completely manufactured product which are ready for sale and fourth is office and plant cleaning materials (soap, brooms etc), oil bulbs and the like these materials don't directly enter production' (Pandey, 1994)

Profit planning is an important approach mainly in profit-oriented enterprises profit planning is a tool of management not the substitute of management. In order to attain long-range efficiency and effectiveness, management must chart out its course of action in advance. Profit is the ultimate goal of every business organization. But usually, profit does not just happen. Profits are managed. When the management plans its profit performance than that is known as profit planning. Profit planning is a part of overall planning process of an organization. The process of preparing and using budget to achieve management objective is called budgeting. (*Jain and Narang, 1993*:).

“Comprehensive profit planning” is a new term in the literature of business. Though it is a new term, it is not the new concept in management. The other terms that can be used in the same context are comprehensive budgeting, management budgeting and simply budgeting. Comprehensive profit planning can be defined as a process designed to the management effectively perform significant phase of the planning and control function. (Agrawal, 2000)

In sum, profit planning and control is a comprehensive tool that is used by management in planning for the future course of actions and in controlling for subsequent evaluation of performance. Comprehensive profit planning and control model can be taken as the best use of opportunities for and strengths of the firm and minimization the threats for and weakness of the firm to meet the target profit. The generation of reasonable profit is the main theme of profit planning and control. (Chandra, 1998)

Thus management should pay adequate attention to the inventory management to reduce the cost of production (manufacturing), sales (non-manufacturing) and working capital requirements. Inventory should be maintained in appropriate quantity so as to avoid both under stock and over stock situation, for this purpose, inventory management necessary because the aim of inventory maintains optimum level of inventory for the smooth production and sales operation. Due to lack of proper inventory policies there are many corporations where large amount of capital has been blocked up and very little measures have been taken to manage the inventory. The area of inventory managements covers the following phases: determine the size of inventory with time schedule, procedure and lot size of 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 Salt Trading Corporation

Most of the public enterprises are established not for gaining or earning profit but for providing services or fulfillment of most public concerns.

Salt trading corporation limited is also one of the public enterprises of Nepal, which was established in 2020 B.S. (1963 A.D.) through the joint efforts of His Majesty Government Nepal and private sector to ensure proper supply of consumer's items throughout the country. Its first task was to makes edible salt readily available. The irregularities in the distribution have to correct through organized supply and delivery system. The salt trading corporation limited was not only able to meet the demand but also maintain quality and later was able to provide lionized salt to prevent goiter a diseases that once plagued the Nepalese society.

This success in supply management led to the addition of essential commodities such as sugar, tea, wheat, textiles, grams, maize, milk, oil seeds, fresh and processed fruits, oil cement, coffee and processed eatables into its distribution network profit form training activities were invested in the production of basic necessities to boost self

sufficiency accelerate economic growth and gain public support. From its infancy as a trading house, salt trading corporation limited has matured into a diversified conglomerate with unmatched distribution network all over the country. Its twenty branches scattered throughout the country providing the people easy access to import outlets for good produced in various parts of the country. The employment opportunities that arise through the activities of the organization are hard to quantify as they also providing plenty of self employment opportunity. The salt trading group directly employ about 2500 individuals all of the office in the country.

Salt trading corporation has equity in many pioneering and leading industries in the country such as Khaddhya Udyog Ltd. Spinning Mills Ltd. Gorachakali Rubber Udyog Ltd. Morang Sugar Mills Ltd and Gharelu Hastakala Udyog Ltd. Nepal Vegetables Ghee Udyog Ltd. The organization has also been assigned the responsibility of implementing the Nepal India Goiter Control project. The groups turn over exceeds NRs 2 billion and investment in fixed assets in close to NRs 1.5 billion.

Salt trading corporation limited a major catalyst in bringing about the desired economic changes and growth in Nepal, signing of the first salt contract between the representatives of STCL and state trading corporation of India on 14th July 1965. The organization's accessibility to these remote areas have been turned out to be very rewarding and fruitful as it also provides the opportunities to procure commodities that are locally produced in different part of the country. STCL has been playing a very significant role in procuring goods from different parts of the country and supplying them in areas where they derive optimum value.

The organization began its trading activities by dealing in salt and now it imports produces and supplies good of vast diversities. Industrial products, agricultural products and industrials raw materials are the major components of its. Salt trading corporation limited deals with importing products and distributing or taking it to public reach through sales. Sales, cost profit analysis is very important tool of profit planning and control. This tool examines the behavior of total revenue, total cost and operating income as changes occur in the output level, the selling price, the variable cost per unit and fiscal cost of a product. It is an analytical technique for studying the

relationship between volume, cost, prices and profits. It is used to determine the profit planning process of the firm. It is a simple but powerful tool for planning of profit and therefore, of operations. It provides an answer to "what if" theme-telling the volume required producing a target amount of profit. For a coordination approach towards achieving production and profit goals, it has grown into a basic technique with a focus on future. It has gained greater utility and respectability.

1.3 Statement of the Problems

In Nepal, trading houses are accepted to build the infrastructure to stoke the good and supply consumer goods in complement and supplement to 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 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 also expected to be financially sound and to contribute surplus capital to the national treasury. This success in supply management led to the addition of essential commodities such as sugar, food grains and processed eatables into in distribution network throughout the country. Forty years of dedication and service to the nation and her people has today made Salt Trading Corporation Limited (STCL) a major catalyst in bringing about desired economic changes and growth in Nepal. In addition many previous studies in this area of inventory management indicate that there is poor inventory management practices in Nepalese companies, in order to examine this finding, STCL has been selected and tried to answer the following questions:

- Is there any relationship between inventory and other factor like net sales, net profit, purchase and assets etc?
- Is there any consistency, fluctuate ability of inventory in comparison of others?
- Is a systematic and scientific inventory management system followed by STCL?

1.4 Objectives of the Study

The major objective of the study is to identify and inventory management practice in STCL associated with inventory management problem and analyze them for their resolution in such way that contribute to this profitability to STCL. The specific objectives of the study are as follows:

- To examine the profitability analysis of Salt Trading Corporation.
- To analyzed the condition of inventory management and its relationship with other variable like net sales, net profit, and purchase.
- To show the effect of inventory in cash flow.
- To suggest proper inventory model to STC on the basis of analysis.

1.5 Significance of the Study

Inventory management of the trading house is the important task. If inventory of the organization are not effectively and efficiently manage the organization can't achieve their pre-determined goal. Proper management of the inventory helps to maximize the profitability and do not block the required stock level. Nepal is an under industrialized country is using still traditional technique in purchasing of inventory. To have a sound achievement the organization should use modern tools and technique to reduce cost as well labor.

- How much money should be invested in inventory?
- How can improve the inventory management system?
- what is the present situation of inventory management system are find out from this study ?

1.6 Limitation of the Study

This study deals on just inventory management, not on other dimensions of STCL. Analysis is concentrated in some managerial, financial, accounting and planning aspect to which inventory management linkage. Besides that, it does not cover the other areas of STCL. The study has certain limitations which are given follows:

- The study is based basically on the past data.
- This study is more specific inventory management not on the other functional area.

- The conclusion derive from the study doesn't applicable for all kinds of trading companies.

1.7 Organization of the Study

As specified format of the research study, this study also comprises of five major chapters. They are:

1. Introduction: This chapter includes background of the study, introduction of salt trading corporation, statement of problems, objectives of study, significance of study and limitation of study.

2. Conceptual Frame Work & Review of Literature: This chapter concerns about the concepts of inventory management and review of related studies to highlight the related terms and to present the available information about previous related studies.

3. Research Methodology: This chapter include introduction, research design, sources and nature of data, data gathering instruments, statistical tools used for the study.

4. Data Presentation and Analysis: Various data are gathered from the application of the different methods and presented and tabulated as required by the research objectives. Data are interpreted and analyzed with the help of various analytical tools and technique. Major findings of the study are also included in this chapter.

5. Summary, Conclusions and Recommendations: This chapter includes summary and conclusion of the study. It also includes recommendation on the basis of study.

Recommendation sheet, Declaration, Acknowledgement, Table of contents, List of table, List of figure, Abbreviation has been included at the beginning of this report where as bibliography and appendixes have been included at the end.

CHAPTER - II

CONCEPTUAL FRAME WORK & REVIEW OF LITERATURE

This chapter devotes to review some of the existing literature regarding the profit planning concepts. In this regard, various books, journals and articles concerned to this topic have been reviewed. The first part of the chapter deals with the conceptual framework of the study and the second part is concern with the review of previous articles, journals and dissertation.

2. 1 Conceptual Framework

2.1.1 Concept of Profit Planning

Profit Planning is a predetermined detailed plan of action developed and distributed as a guide to current operations and as a partial basis for the subsequent evaluation of performance. Thus it can say that profit planning is a tool which may be used by the management in planning the future course of actions and controlling the actual performance (*Gupta, 1992*). The term comprehensive profit planning and control it defined as a systematic and formalized approach for performing significant phase of the management planning and control functions.

Profit Planning is an example of short range planning. This planning focuses on improving the profit especially from a particular product over a relatively short period of time. Therefore as used here, it is not the same as corporate planning of a cost rendition program (*Terry, 1968*).

Profit Planning through volume of cost analysis, however, is a modern concept of management planning tools designated primarily for industrial enterprises. It involves a study of what a business cost and expenses should be and will be at different level of operations and it include a study of the resultant effect due to this hanging relationships between volume and cost. (*Young Dong, 2000*).

2.1.2 Types of Planning

Corporate Planning

The concept of corporate planning was first introduced and started in the United State in the late 1950's and nowadays it has been using in several companies in all over the world. The premises of the corporate planning are as follows (*Robertson, 1968*).

1. Before drawing up a plan which is designed to decide something what the corporation wants to do.
2. In these days of rapid change it is necessary to look ahead as far as possible to anticipate these changes.
3. Instead of treating a company as a collection of departments treat it as a corporate whole, and
4. Take full accounts of the company's environment before drawing up and plan.

He has also defined corporate planning as, it is to determine the long term goals of a company as a whole and then to generate plans designated to achieve these goals bring in mind probable change in its environment.

Strategic Long-Range Planning

Strategic planning is a top management function in which the organization's purpose, mission and overall objectives and policies are developed to position the organization advantageously in its operating environment. It refers to the selection of company objective and the determination of the growth or at least constant and competitive policies that are most likely to accomplish those objectives. It is carried out the highest policy making level of the organization will travel. Management planning and control is the process carried on within the framework established by strategic planning. Long range 5 to 10 years varying with the enterprise sometimes extended to 10 years. It is one of the most difficult times span involved in planning as many problems in short range planning can be traced to the absence of clear sense of direction and the practice which a comprehensive long-range plan provides. Basically, the long-range planning is more important for broad and long living enterprises. A long-range planning is closely concerned with the concept of the corporation as a long living institution (*David,1964*).The planner must include the following factors in his/her plan from the analysis of available information.

- a. Probable future opportunity
- b. Uncertainty and

c. Challenges

Long range planning is the continuous process of making present entrepreneurial (risk taking) decision. Systematically and best possible organizing efforts is need to carry out these decisions and measuring the result of these decisions against the expectations through organized systematic feedback (*Drucker, 1964*). It is a decision making process. Such decision should be related about:

- Determination of goals, objectives and strategies.
- Level and direction of capital expenditure.
- Accession of new sources of funds.
- Organization design and structure etc.

Tactical Short Term Planning

A tactical planning is done at all level and involves directing the organizations activities to achieve overall strategic objectives with the organization's mission and policies. Standing plans provide consistency and efficiency for non going operations, and single use plans are developed for unique situation. Projects are short term plans designed to achieve objective within large scale programs. Short term plans cover about a year, and are less formal and detailed than long range plans, which usually cover more than three months. The short range planning is selected to conform to fiscal quarters or years because of the practical need for conforming plans to accounting periods and the some. What arbitrary limitation of the long range to three to five years is usually based as has been indicated on the prevailing belief that the degree of uncertainty over a long period makes planning of questionable value” (*Horold & Cyric, 1964*).

2.1.3 Role of Forecasting in Planning

Forecasting is an integral part of decision making activities of management. An organization establishes goals and objectives seek to predict the environmental factors. The need for forecasting is increasing as management attempts to decrease its dependence on change and become more scientific in dealing with its environment. Since each area of organization is related to others. A good or bad for cast can affect the entire organization. Planning or budgeting is not nearly forecasting although forecasts from the basis of budgeting. Forecasting is the estimate of the future

environment within the company will operate. Budgeting or planning on the other hand involves the determination of what should be done, how the goals may be reached and what individual or units are to assume responsibility and be held accountable.

Forecasting is indispensable in planning. Forecast is statement of expected future conditions definite statements of what will actually happen are patently impossible.

Expectation depends upon the assumptions made. If the assumptions are possible the forecast has a better chance of being useful forecasting assumptions and techniques vary with the kind of planning needed. (*David,1964*).

2.1.4 Planning Verses Forecasting

Planning is clearly distinct from forecasting. Forecasting one of the essential elements of planning is a prediction of what will happen on the basis of certain assumption. Planning is an attempt to determine what should happen and what will make it likely to happen. A forecast is not a plan, rather it is a statement of land or quantified assessment of future conditions about a particular subject (sales revenue) based on one or more explicit assumption. A forecast should be viewed as only one input into the development of a sales plan. The management of a company may accept modify or eject the forecast. In contrast a sales plan incorporates management decision that are based on the forecast, other inputs and management judgment about such related items as sales volume, price, production and sales, effort and financing (*Welsch, et. al., 2001;*).

2.1.5 Purposes of Profit Planning

Some purposes for the application of profit planning are:

1. To state the firms expectations in clear and facilitate for attainability.
2. To communicate expectations to all concerned with the management of the firm so that they are understood, supported and implanted.
3. To provide a detail plan of action for reducing uncertainty and for the proper direction of individual and group efforts to achieve goals.
4. To coordinate the activities and efforts in such as way the use of resource in maximized.

5. To provide a means of measuring the performance of individuals and units and to supply information on the basis of which the necessary corrective action can be taken.

There is controversy in the term of profit. It is defined by different people from different aspects. According to RM Lynch and Robert Williamson usually profit does not just happen, profits are managed. Before we can make intelligent approaches to the management concept of profit, there are after all, several different interpretations of the term. Profit, an economist says that profit is the reward of entrepreneurship for risk taking. A labor leader might say that it is a measure of how efficiently labor has produced and that it provides a base for negotiating a wage increase. An investor views it as a gauge for return on his/her investment. An internal revenue agent might regard, it is the base for determining income taxes. The accountant will define it simply as the excess of firm's revenue over the expenses of producing revenue in a given period. Management thinks of profit as a tangible expression of the goals it has set for the firm, a measure of the performance towards the achievement of it, as a means of measuring the health, growth and continuity of the economy (*Lynch & Williamson; 1989:*).

2.1.6 Meaning of inventory management

“Inventory management involves planning of optimal level of the material and control of material cost supported by an appropriate organization structure, which is staffed by trained person and directed by the top level management. It involves both financial dimensions as well as physical dimension and these dimensions are interrelated and can't be looked in isolation. Inventory in the form of raw materials, Work-in- progress and semi- finished goods are of great significance for the success of an enterprise. These can directly affect the efficiency of the system; it is observed, irrespective of the size of an enterprise” (*Agrawal, 2000:*).

The expenditure on materials is a major item of budget in many cases materials consumption varies from 25% to 75% of sales turnover. The expenditure made on materials in money invested in inventories, transportation cost, cost of storage, wastage, insurance etc. Because of the magnitude of expenditure required on acquiring and controlling inventory and their impact on profit, a great deal of attention is required towards the management associated with materials. Materials Management

is one of the aspects of production management. Production management is developed and handled by production engineer. (David,1964).

The inventory management is assumed to maintain an adequate supply of correct materials at the lowest total cost. The responsibility of determining the material requirement implied by the marketing forecast and liaising with the purchasing department for their acquisition, receiving and storing the material safely and in good condition for its subsequent issue and identifying surplus stock and taking action to reduce it.

Investment in inventory is working capital and therefore the control of inventories is an important aspect of operation management. The basic questions in the management of inventory are

- a) How much inventory to keep? &
- b) When and how long to keep?

Before getting to a mathematical solution of the above questions, let us understand the function of inventory management.

- There are inventories for normal consumption requirement rates and average lead times for procurement/manufacture of the materials, inventories are kept at the appropriate time.
- A production process however continuous it may be is bound to have some interruptions. It may also have imbalance in the consumption and production rates of the materials at different stages of the production process. These interruptions and imbalance make it necessary to keep stocks of inventories between the different stages of the operation.

Every Enterprise needs inventory for smooth running of its activities. It serves as a link between production and distribution process. There is a time lag between the reorganization of a need and its fulfillment. The greater the time lag the higher the requirement for inventory. The unforeseen fluctuation in demand and supply of goods also necessitate the need for inventory. It provides a cushion for future price fluctuations. About 90% part of working capital is invested in inventories, it is necessary for every Management to give proper attention to inventory management. A proper planning of purchasing,

storing, handling, and accounting should form a part of inventories management.

An efficient system of inventory management will determine

- What to purchase?
- How much to purchase?
- From where to purchase?
- Where to purchase? (*Sharma and Gupta, 1998*).

“Executive in production, purchasing and marketing departments, take decisions relating to inventories primary. Usually raw materials policies are shaped by purchasing and production executive. Work-in-progress inventory is influenced by the decision of production executive and finished goods inventory policy is evolved by production and marketing executive. Yet as inventory management has an important financial implication it has the responsibility to ensure that inventories are properly monitored and controlled. It has to emphasize the financial point of view and initiate programs with the participation and involvement of others for effective management of inventory” (*Chandra, 1998*).

Thus, Inventory management means not only a branch of production management, it is an integrated view of management companies devoted a great deal of attention to the efficiency of their materials and inventory management operation. A brief look at the historical evolution of material management will give us a fuller appreciation of the current situation. The production foreman was focal point and purposes in complete control of the production activity. He hired fire and promoted, he purchased the necessary raw materials scheduled production and handled individuals almost all of the other aspects of production. (*Hampton 1990*).

Every business operation however big or small has to maintain some inventory, inventories serve as cushions to observe the stock of errors in demand forecast and provide more efficient use of the resources. Inventory for any organization is necessary and requires careful planning and formulation of policies keeping in view the best interest of the organization. Depending upon the nature of the industry and

firm, inventories may be durable and non durable. The various forms of inventory occur in manufacturing enterprises are as below:

Raw material

The basic input 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 purchase and store 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- Progress

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.

Sometimes it is very difficult to identify whether that is finished good 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-progress plays crucial role to facilitate production while stock 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.

Office 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.

2.1.7 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 house or by the manufacturing house 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 lost 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. Any way optimal level of inventory management should be lie as follows:

- To ensure regular supply at the time of demand.

- To maintain the sufficient level of stock at the time of shortages and price changes.
- To minimize the carrying cost and ordering cost.
- To reduce the lead time.
- To control over the investment in inventory and keep in optimal level.

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 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 impact the profitability of the organization or in other word decreases the profitability.

It is not easy to supply the inventory customer without demand. So over investment on the inventory should be cut down by the organization maintain the optimal level. Whereas under investment on the inventory is also not good for 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 maintained on the basic 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 various objectives of the inventory management are summarized as follows:

- To maintain to available all types of inventory at the time of required.
- Do not invest over or under amount of capital in the inventory.

- To reduce the wastage at the time of store in the godown.
- To reduce risk of spoilage and obsolescence of inventory by using the LIFO and FIFO.
- To communicate up to date information about level of inventory the top management.

2.1.8 Need and Importance of Inventory Management

Inventories in any organization are of pivotal role. If the organization is not paying attention to inventory management, it will affect the efficiency and profitability of the organizations. Buffa observes a “inventory serve the vital function developing the various operation in sequence beginning with raw materials extending through all the manufacturing operations and into finished goods storage and continuing to warehouse and retail store” (*Buffa, 1998*).

Importance of inventory management can be written as follows:

- Inventory helps in smooth and efficient running of business.
- Inventory provide service to the customers immediately or at a short notice.
- Due to absence of stock, the company may have to pay high pieces because of piece-wise purchasing maintaining of inventory may earn price discount because of bulk purchasing.
- Inventory also acts as buffer stock when raw materials are received late and so many sales - order are likely to be rejected.
- It reduces product cost because there is an additional advantage of batching and long smooth running production runs.
- Inventory helps in maintaining the economy by absorbing some of the fluctuations when the demand for an item fluctuates or is seasonal.

2.1.9 Cost Associate with Inventory

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

i. Carrying/Holding cost

Total carrying generally increase in direct production to the average amount of inventory carried. Inventory carried in turn depended upon the frequency with which order are placed. The cost associated with having inventories, which include storage cost, insurance cost, depreciation cost and so on. These costs generally increase in production the average amount of inventory held. To illustrate, if a firm sales S unit per and if it places equal order N times per year then $Q=S/N$ unit will be purchased with each order.

If the inventory is used evenly over the year and if no safety stock is carried then the average inventory A will be:

$$\text{Average Inventory (A)} = \frac{\text{Unit Per Order}}{2} = \frac{Q}{2}$$

Defining the annual percentage carrying cost as C, annual total carrying cost as (TTC), as The percentage carrying costs C times, price per unit PP times the average inventory in units A.

$$\text{Total Carrying Costs (TCC)} = \text{CPP} \times \text{A}$$

The inventory carrying costs are further explained as:

Capital Opportunity Cost

This consists of expenses of rising funds (interest on capital) to finance the acquisition of the inventory, if funds were not locked up in inventory. They would have earned a return .This is opportunity cost of the funds or financial cost of components of the cost.

Funds associated with inventory are not available for other uses. Therefore, an opportunity cost determined by alternative use to which could be put. For example, for the alternative uses if firm can earn 10%.

Handling Cost

The size of consignments and the material handling facilities in the store determines these costs up to a certain level of inventory size per unit handling cost decrease with that level per unit handling costs start increasing.

Storage Cost

The cost associated with maintenance of inventory is storage cost .These include expenditure made on inventory staff, expenditure to provide various facilities like heating, floor space, shelves , lighting , and racks , bins and containers, materials handling equipments and other provision for safe and proper storage of items. These costs generally depend upon the volume to value ratio of an item.

Spoilage and Shortage Cost

Many products deteriorate over time in storage. The precise nature deteriorates various from product to product but whatever the causes, it represents reduction in the company's assets and such in a cost a holding inventories. This is term as a spoilage cost sometimes because of shrinkage and pilferage of inventory.

Depreciation Cost

In every organization, the value of the capital investment decrease with time. Thus, there is tendency among organization to reduce is capital investment on machines and other equipments. The depreciation costs are thus reduced. Naturally the desired among of production with running the machines in stock period thus increasing the size of inventory.

Insurance and Taxes

Many of the goods in inventory require and it should be included in inventory holding cost, whether the year. The inventory a firm has on hand those data's the higher their tax bill will be. Where such taxes are in effect prudent inventory management may dictate periodic reduction in inventory to coincide with the data on which the assessments are made.

(II) Ordering Cost

It is assumed that carrying costs are entirely variable and increase in direct proportion to the average size of inventory, ordering cost usually are fixed regard less of average size of inventory for example the cost of placing and increasing in an order generally inter office memos using fax transmission or long distance telephone call and taking delivery essentially are fixed regardless of average size of an inventory.

In practices the cost per order generally contains both fixed and variable components, since zero portion of cost such as that receiving and inspecting the order normally varies with the quantity order. Ordering cost may differ in the sense of inventories nature in case of raw materials ordering cost involves the clerical cost in placing an order as well as certain cost receiving and checking the goods once they arrive for finished goods, ordering cost involves scheduling a production run and for work in progress ordering cost likely to involves nothing more than record keeping furthermore, ordering cost are the cost involved in placing and receiving an order or purchased item.

The expenses involved in this cost are:

- Cost of placing an order,
- Requisition cost.
- Transportation/ shipping cost,
- Receiving, inspecting and storing cost,
- Cost incurred when raw materials in transit,
- Insurance of raw materials,
- Telephone / Fax / Postage/ Expenses,
- Sales tax, customs,
- Clearing and forwarding cost,
- Bank commission/ LC charge,
- Stationary cost etc (*Van Horne, 1985*).

Ordering cost increases with the number of order, thus more frequency in inventor acquired, higher the firm ordering cost. On the other hands if the firm maintains large inventories level there will be few orders placed the ordering cost will be relatively small. Thus, ordering costs decrease with the increase size of inventor.

The fixed costs associated with ordering inventories as O and we placed N order per year. The total ordering cost is given as:

$$\text{Total ordering cost (TOC)} = O \times N = O(S/Q)$$

Where, TOC = Total Ordering Cost

O = Fixed cost per order

N = No of order placed per year

Q = Inventory Quantity for each order

iii. Stock-out costs

Stock out cost is associated with demand. The depletion in stock results in loss in sales or back order costs. When the sales are lost due to stock out, the firm losses both the profit, margin on unmade sales and the firm's goodwill. If the customer uses another business elsewhere, future profit margin may also be lost and back order cost in needed to convince customer to use again after inventories have been replenished. Back order cost includes, loss of goodwill money paid to re-order goods and notification to customer when goods arrived.

Stock out cost computed from following formula:

Stock out Cost = Inventory cycle per year × Stock output units × Probability of Possible stock out × Unit stock out cost.

$$\text{Inventory cycle per year} = \frac{\text{Annual uaes}}{\text{Quantity order size}}$$

2.1.10 Technical Formulation

The most of the common problem appeared in every business firm is how to established 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.

2.1.11 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 ensures the provision of the required quantity of inventories at the time of required 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 the 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 at a desired point. 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 affect and better inventory control.

2.1.12 Technique of Inventory control

For effective and efficient control of inventory, the following types of technique 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 tied up of capital. Therefore, an efficient inventory management required 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 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:

$$\text{Minimum Stock Level} = \text{Reorder Level} - (\text{Normal Consumption} \times \text{Normal Lead Time})$$

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

Maximum stock Level is determined by the following formulae:

Maximum stock level = Re-order level + Recorded quantity—(minimum consumption × Minimum recorder period.)

d. Average Stock Level: An average stock level indicates the average stock held by the firm. It is calculated by following formulae:

$$\text{Average Stock Level} = \text{Minimum level} + \frac{1}{2}(\text{Re} - \text{order Quantity})$$

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 materials 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-order 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. The re-order level is calculated by using the following formulae:

Re-order level = Maximum usage × Maximum lead time.

Re-order level = Maximum level × Consumption during lead time.

Re-order level = Safety stock + (Lead time × Daily Consumption).

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. It is determined by the using following formulae:

$$\text{Danger level} = \text{Average consumption} \times \text{maximum Reorder period for emergency purchase.}$$

2.1.13 Economic Order Quantity (EOQ)

2.1.13.1 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 materials and in the storage of finished goods and transit inventories. To determine the optimal order quantity for particular item of inventory, given its forecasted usage ordering cost and carrying cost. Ordering can mean either the purchase of the item or its production (*Van Horne, 2003*).

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 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.

2.1.13.2 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: (*Van Horne, 2003*).

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

Where,

- EOQ = Economic Order Quantity
- A = Annual requirement of product
- O = Ordering cost per order
- C = Carrying cost per unit per year

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 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 compute and the order size with the lowest total cost (ordering+ carrying of inventory is the economic order quantity. A tabular arrangement of data relating to items of material may allow.

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

$$\text{Order Size} = \frac{\text{Annual requirement}}{\text{No of orders}}$$

$$\text{Average Inventory} = \frac{\text{Order Size}}{2}$$

$$\text{Ordering Cost} = \text{No. of orders} \times \text{ordering cost per order}$$

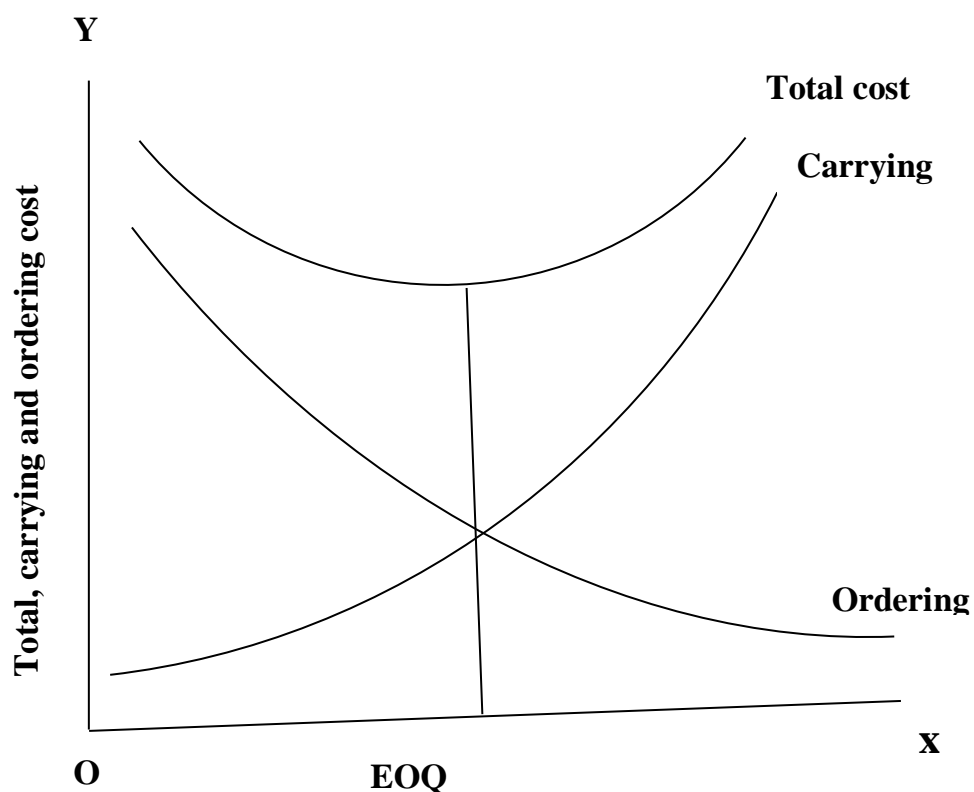
$$\text{Carrying Cost} = \text{Average Inventory} \times \text{Carrying cost per unit per year}$$

$$\text{Total Cost} = \text{Ordering cost} + \text{Carrying cost}$$

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 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 type of costs which have differently with order size. The total cost decline in 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).

Figure: 2.1
Graphic Approach



2.1.14 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 order point. It is also known as order point or optimal re-order point or re-order 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 material. 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 and order is placed and time delivered. Transit stock is determined by using the following formulae:

Transit Stock= Stock Used per Time Period × Transit time.

The re-order point is the level of inventory at which the firm places an order in the amount of 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.

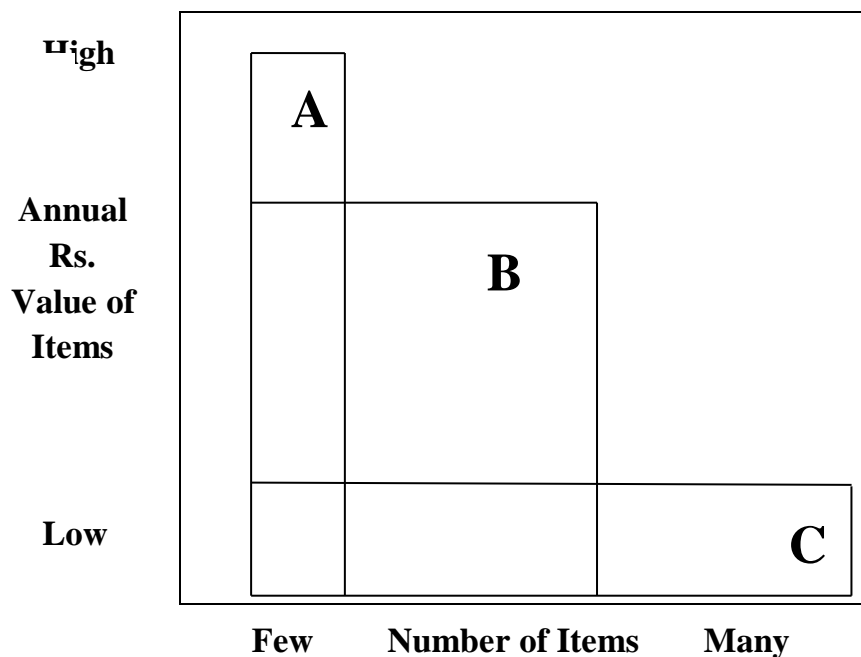
2.1.15 Always Better Control (ABC) Analysis

Manufacturing organization find it useful divided material into three categories for the purpose of exercising selective control on materials. An analysis of the materials costs will show that smaller percentage of items of materials in the store may contribute to

a large percentage of the value of consumption and on the other hand a large percentage of items may represent a smaller percentage of the value of items consumed between these two extremes will fall those items the percentage of which is more or less equal to their value of consumption item falling in the first category are treated as 'A' items of the second category as 'B' items and items of the third category are taken as 'C' items such as, analysis of material is known as ABC analysis. This technique of stock control is also known as stock control according to the value method or always better control method or proportional parts value analysis method. Thus, under this technique of material controls, materials are listed in 'A', 'B' and 'C' categories in descending order based on money value of consumption. ABC analysis measures the cost significant of each item of material. It concentrates on important items, so it also known as Control by importance and exception (CIE). Classifying inventory according to some measure of importance and allocating control efforts accordingly.

- Very important
- Moderate important
- Least important

Figure 2.2
ABC Classification system



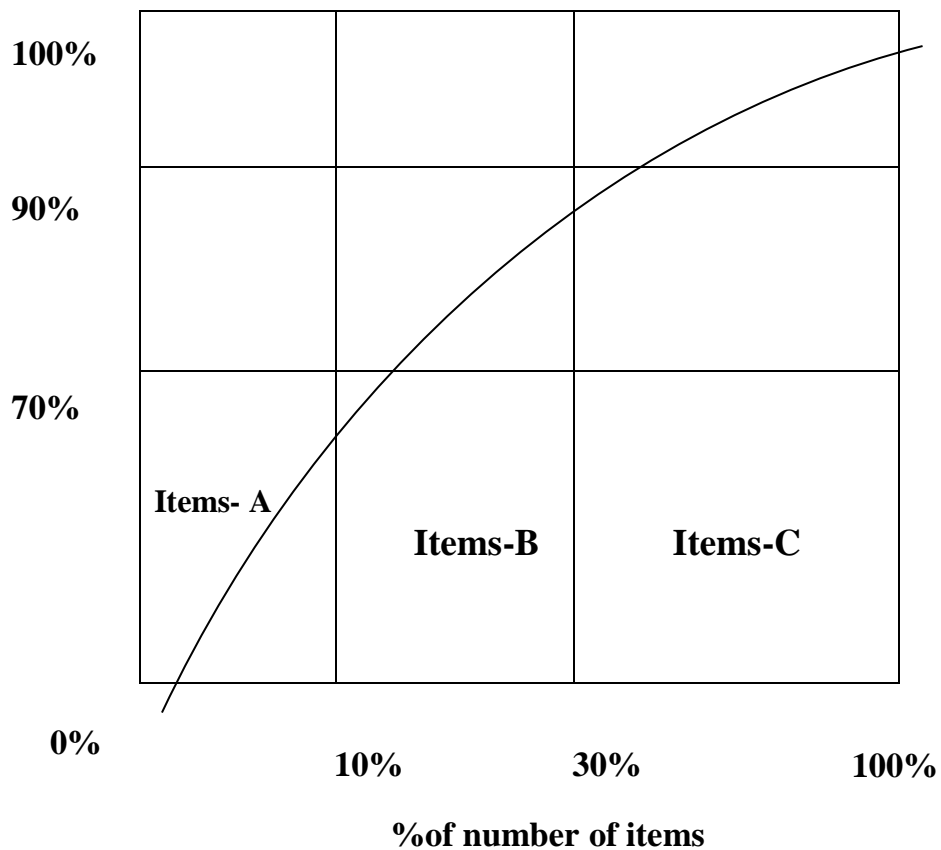
The report of Indian productivity term on report of “store and inventory control in U.S.A, Japan and West Germany” gives the following example of ABC analysis.

Table 2.1
ABC Classification System

Group	Percentage of Items	Percentage of cost
A	8%	75%
B	25%	20%
C	67%	5%

The significance of this analysis is that a very close control is exercise over the items of ‘A’ group which account for a high percentage of cost while less stringent control is adequate for categories ‘B’ and very little control would sufficient for category ‘C’ item. The graphical representation of ABC Analysis may be as given below.

Figure 2.3
Graphical presentation of ABC Analysis



Procedure;

The steps computing ABC analysis is:

- First we calculate annual usage, multiplying the quantity (number of the unit) of the item consume in one year by its unit price.
- Arrange all inventory items, first items will show maximum annual usage in rupees. The second item the second maximum. The third items the third maximum and so on. After having done this, total of annual usage in rupees is put at the bottom of the last.
- Inventory items are categorized on the basic of annual usage and its price, which item has more annual usage and higher its price these item is categorized as 'An' item, which contribute lesser then categories. This should be kept in categories 'B' and the rest contribution the total percentage of annual usage is called 'C' categories.
- Placing of the order on the basis the classified (*Magee, 1956:233*)

2.1.16 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 material 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 arrives under the system. Thus, inventories are not ordered on maintain relatively a low inventory level. The main objective of this system is to avoid or reduce the level of inventory the corporations. The JIT system reduce 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

2.1.17 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 drops 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 record 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 record 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" An application of the fixed-order size approach is one of the oldest inventory system in use for illustration let us imagine that all material of given type is placed in two large bins. When the first empty, the second is put into use and a replacement order for fixed amount is dispatched immediately when the new materials arrives, it is placed in the empty bin and the process continues.

In the second basic type the fixed order interval system, periodic review 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 inventory is known only at the time of review, which may take place weekly monthly, quarterly or yearly. Because of this inventory system of this type is commonly called "Periodic inventory system" such systems are generally used for class B or C inventories or in instances where the large number of items precludes the updating of each inventory transaction.

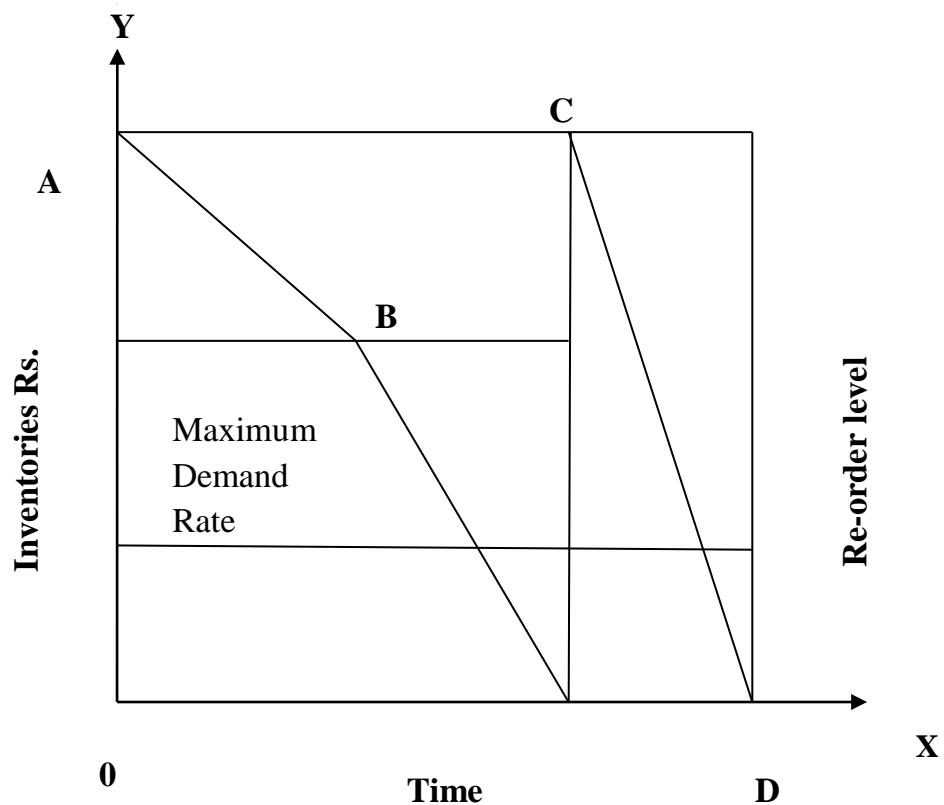
- Periodic System: Physical count of items made at periodic intervals.
- Perpetual Inventory System: System that keeps track of removal from inventory continuously, thus monitoring current levels of each item.
- Two-Bin System: Two containers of inventory recorder when the first is empty.
- Universal Bar Code: Bar code printed on a label that has information about the item to which it is attached.

2.1.18 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 chance are excellent that no shortage will result. This is illustrated in as follows figure:

Figure: 2.4

Relationship of fixed order size and safety stock



In the above figure, for e.g. 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 for 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 ware equal to maximum demand, no stock out occurred. Instead, all that happened was that orders were placed in an increasing rate.

2.1.19 Perpetual Inventory System

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 of England and Wales define perpetual inventory system as ‘A system of record maintain by a 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.

2.1.20 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 suppliers 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 cost 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 order so that they can plan their production runs

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

2.1.21 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 effect 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 statement for each period for which financial statement are presented.

2.1.22 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 payment of an enterprise during a period. Information about enterprise 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. Investor 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 company has ability to meet unexpected obligation and ability to make 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 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 effect 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 assessment of future cash flows and in examining the relationship between profitability and net cash flow and the impact of changing prices.

2.1.23 Objective of Cash Flow Statement

The cash flows statement of enterprises is useful in providing information to the users of financial statement about the ability of the enterprise to generate cash and cash equivalents and the need of the enterprises to utilize those cash flows. Information about the cash flows of an enterprise is useful in providing users of financial statement a basis to assess the ability of the enterprise to generate cash and cash equivalents and the needs of 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 timing and certainty of their generation. The objective 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 event 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 known 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.

2.2 Review of Articles

Inventory management is wide subject but no one-pay attention in the subject. Many modern techniques to control inventory management have been developed; still many problem/ difficulties have faced by many manufacturing company. In Nepal there are many public enterprises facing with inventory problem. Any analysis has been made about only the aspect of financial performance. A few researchers made research in inventory management of manufacturing company.

From the various studies of thesis, dissertations business reports and other sources, it is found that no public enterprises are apply modern methods or techniques to manage as per the requirement .So far the related studies, some studies made on inventory management are considered relevant ,which are shown below according to their major findings.

Bajracharya(1983) has conducted his study on “*Management Problem in Public Sector Manufacture Enterprises in Nepal*”. One of the important finding was the inventory. There management suffer from lack of planning high carrying cost, poor recording and stores management and virtual absences of controlling system. Inventory management is to discover and maintain the optimal level of inventory investment minimizing the cost of inventory. So, physical and financial dimension of inventory should be effectively managed. If the top management cannot be managed

efficiently, these will be an adverse effect upon profits which is main goal for maximizing the profit of a modern company.

Inventory management has to do with keeping accurate records of finished goods that are ready for shipment. This often means posting the production of newly completed goods to the inventory total as well as subtracting the most recent shipment of finished goods to buyers .When the company has a return policy in place there is usually a subcategory contained in the finished goods inventory to account for any returned goods that are reclassified as refurbished or second grade quality .Accurately maintaining figures on the finished goods inventory makes it possible to quickly convey information to sales personnel as to what is available and ready for shipment at any given time .

2.3 Review of Previous Research Works

Dhakal (2006), has conducted a study on “*A study on Inventory Management and Control of Royal Drug Ltd*”.

The main objectives of the study are:

- To find out what types of tools and technique has been applied by the RDL to manage inventory.
- To identify the problems which ware underlying the inventory management and control system and the techniques employed by it.

The main findings of the study are:

- The RDL has established a established a separate unit for management of inventory although the separate unit unable to manage 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.

Bhusal (2007) has conducted a study on “*Inventory Management (A comparative4 study of DDC and SGML)*”.

The main objectives of the study are:

- To examine present inventory management and control system of DDC and SGML and their impact towards the companies’ profitability.

- To examine the inventory management system as practiced by the both companies and to suggest some models for effectiveness of the companies’.

The main findings of the study are:

- The DDC and SGML have ineffective and inefficient inventory management system. The huge amount of money was blocked in the inventory.
- Both the companies did not followed economic order quantity model for purchasing purpose.
- Both companies has 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 the holding inventory was not recorded separately which were recorded in total as a whole.
- There were no consistencies using principle of inventory management closing stock of both companies. They made re-order after stock was finished.

Maskey (2008) has conducted a study on *“Inventory management: a case study of Gorkhapatra Corporation”*.

The main objectives of the study are:

- To collect the information underlying constants in existing management and control system of inventory and their impact towards the corporation’s profitability.
- To examined the existing inventory management system applied by corporation.
- To analyze the relationship between inventory, material cost and profit.

The major findings of the study are:

- The tools and techniques of inventory control system are not effectively utilized.
- The goals and objective are not clearly defined.
- The corporation does not consider the proper storing system to improve the efficiency.
- The corporation dose not maintains a color machine in modern age.

Upreti (2009) has conducted a research on “*Inventory management and its Impact on Working Capital Management of Unilever Nepal Limited*”.

The main objectives of the study are:

- To identify the inventory management system of unilever Nepal Ltd.
- To identify the inventory position on UNL.
- To know the relationship between sales and inventories with identifying their trend.
- To assess the inventories and their consequences on profitability of UNL.

The major findings of the study are:

- 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 lead-time.

Gaire (2010) has conducted a research on “*Inventory Management of Bottlers Nepal Limited*”.

The main objectives are:

- To examine the inventory policy and inventory management by BNL.
- To assess the inventory management system of BNL is scientific or effective.

The major findings are:

- Inventory management system of BNL is neither scientific nor effective.
- The inventory purchase and sales maintain by the company are fluctuating severally.

Pandey (2011) has conducted a study on “*Inventory management of Salt Trading Corporation*”.

The main objectives are:

- To analyze the condition of inventory management and its relationship with other variables like net sales, Net profit, purchase.

The major findings are:

- Corporation applied ABC and EOQ technique of inventory management. However; it is applied ineffectively and unsystematically.
- The corporation has not adopting appropriate inventory policy.
- Liquid ratio is not satisfactory during study period.

Gnawali (2012) has conducted a study on “*Inventory Management of National Biscuits and Confectionary Limited NEBICO*”.

The main objectives of the study are:

- To find out applied techniques used to manage the inventory in NEBICO.
- To present and analyze the inventory management system of NEBICO.
- To compare sales revenue with production unit and Raw-material cost.

The major findings of the study are:

- The company does not follow the proper target for material purchase.
- The company is unable to utilize its existing capacity in the production of Biscuits and confectionary.
- The company has ignored about vital item, essential items and desirable items analysis.
- The company has not applied just in time management concept with helps to reduce extra expenditure for inventory.

2.4 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 research tried to show the effect of inventory in cash flow. And also try to examine the profitability analysis of salt trading corporation limited. So we can conclude that this study is different from others in terms of sample, size, and data procedure and also different in tools used.

CHAPTER-III

RESEARCH METHODOLOGY

Research methodology is a process of arriving to the solution of problem through planned and systematic dealing with collection, analysis & interpretation of the facts & figures. It is a way to systematically solve the research problem. It refers to the various sequential steps that are to be adopted by a researcher during the course of studying the problem with certain objectives. *(Joshi; 2010:74)*

This chapter refers to the overall research method from the theoretical aspects to the collection and analysis of data. This study covers quantitative methodology in a greater extent and also use the descriptive part based on both technical aspects and logical aspect. This research tries to perform a well-designed quantitative and qualitative and qualitative research in a very clear and direct way using both financial and statistical tools.

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. Secondary 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 used collected through the observation survey technique. The major sources of data are as follow:

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 secondary sources were managed, analyzed, present in proper tablets, and tabulated into necessary format systematically. Following financial and statistical tools were used to analyzed and interpreted.

3.3.1 Ratio Analysis

Ratio analysis, financial techniques which were used to analyzed 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 analyses financial data:

$$1. \text{Inventory to Sales Ratio} = \frac{\text{Inventory}}{\text{Sales}}$$

$$2. \text{Current Ratio} = \frac{\text{current Assets}}{\text{Current Liabilities}}$$

$$3. \text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$4. \text{Inventory to Total Assets Ratio} = \frac{\text{Inventory}}{\text{Total assets}}$$

$$5. \text{ Inventory to Current Assets Ratio} = \frac{\text{Inventory}}{\text{Total Current Assets}}$$

$$6. \text{ Inventories to Net Profit Ratio} = \frac{\text{Inventories}}{\text{Net Profit}}$$

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 be appropriate, such as where higher inventory levels occur in anticipation of rapidly rising prices or shortages.

$$1. \text{ Inventory Turn over Ratio} = \frac{\text{Cost of Goods Sold (COGS)}}{\text{Average Inventory}}$$

$$\text{or, Inventory Turn over Ratio} = \frac{\text{Net Sales}}{\text{Inventory}}$$

Where,

$$\text{Average Inventory} = \frac{\text{Beginning Inventory} + \text{Ending Inventory}}{2}$$

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:

$$\text{Inventory Holding Days} = \frac{\text{Average Inventory}}{\text{Cost of Good Sold}} \times 365$$

Or,

$$\text{Inventory Holding Days} = \frac{\text{Closing Stock}}{\text{Sales}} \times 365$$

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, mean, standard deviation and co-efficient of variance had been used as necessary. The trend analysis was used for different variables which were as follows:

1. Trend analysis on 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 Purchase.
5. Trend Analysis of Cash Flow and Inventories.

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

The basic objectives of this study as stated in chapter one is to study on inventory management of public enterprises (with reference to Salt Trading Corporation). To achieve the specific objectives of the study, this chapter presents the presentation, analysis and interpretation of data. Now in this study the effort has been made to assess and analysis the inventory management practices.

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, tire, 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 sales were generated keeping minimum inventories.

Table: 4.1
Inventory to Net Sales Ratio

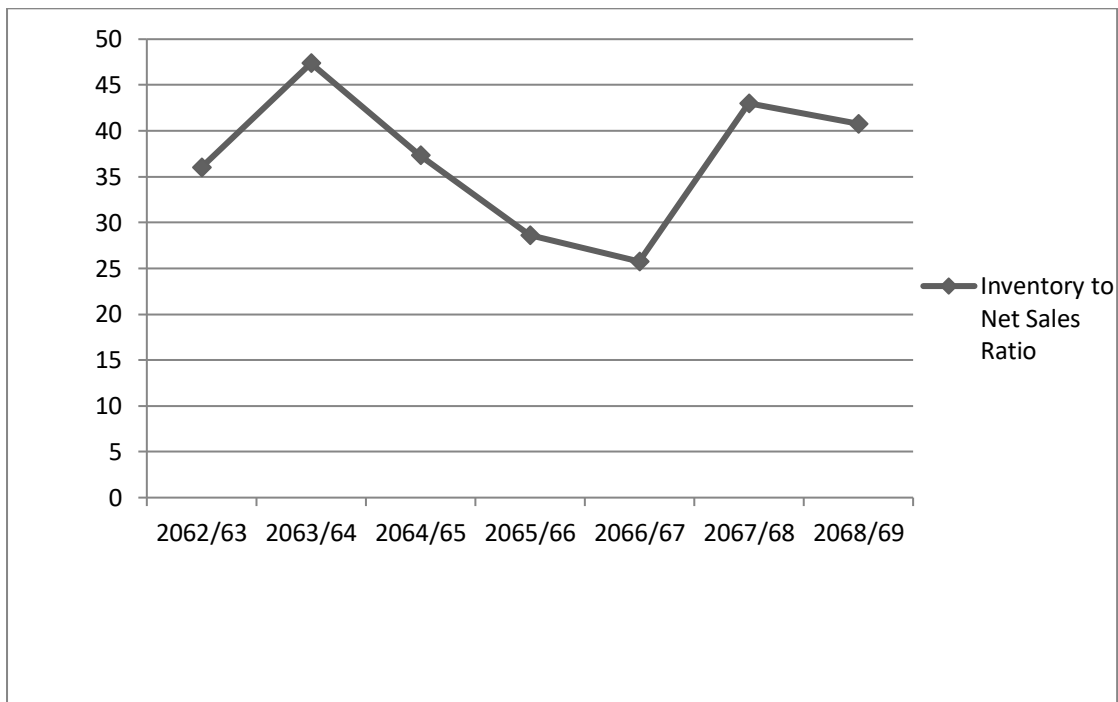
(Rs. In Crores)

Fiscal Year	Inventory (Rs)	Net Sales(Rs)	Inventory to Net Sales Ratio (%)
2062/63	78.99	219.40	36.00
2063/64	87.66	185.06	47.37
2064/65	71.45	191.62	37.30
2065/66	61.16	213.90	28.60
2066/67	100.71	391.05	25.75
2067/68	144.75	336.64	43.00
2068/69	157.94	387.41	40.77

(Source: Annual Reports of STC)

In the above table 4.1 shows the inventories to sales ratio of seven years. The lower Ratio is 25.75% in the fiscal Year 2066/67, while higher ratio was 47.37 in the fiscal year 2063/64. Taking ratio 37.30% as base ratios of fiscal year 2064/65, 2066/67 and 2067/68 are formed low and satisfactory. While the ratios of the 2063/64, 2067/68 and 2068/69 are higher than other year. The inventory to sales ratio 47.37% 43.00% and 40.77% in the fiscal year 2064/65, 2067/68 and 2068/69 are unsatisfactory. The ratios of the years 2063/64 has been increase because of increase in inventory and decrease in net sales.

Figure: 4.1
Inventory to Net Sales Ratio



4.1.2 Current Ratio

Current ratio is the test of liquidity. It measure short-run debt paying ability of the STC. In other 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.

Table: 4.2
Current Ratio

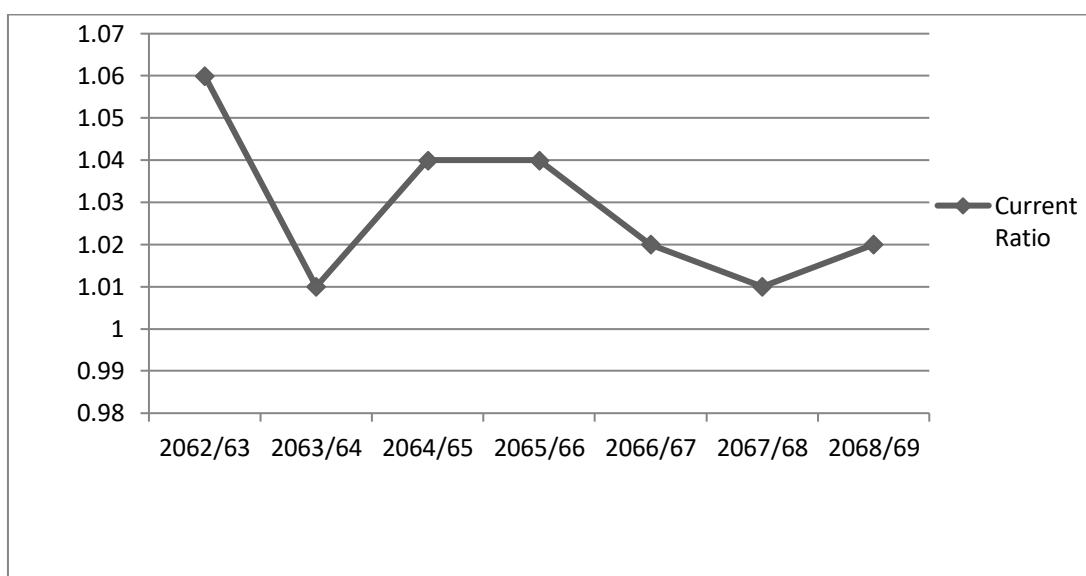
Rs. In Crores

Fiscal year	Current Assets	Current Liabilities	Current Ratio
2062/63	175.10	165.41	1.06
2063/64	188.42	186.50	1.01
2064/65	189.20	182.23	1.04
2065/66	187.75	180.82	1.04
2066/67	252.99	248.51	1.02
2067/68	287.45	284.30	1.01
2068/69	328.63	322.22	1.02

(Source: Annual Report of STC)

The standard current ratio is equal to 2:1, i.e. current assets double to 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 4.2 comparatively, current ratio of STC is not satisfactory. The maximum current ratio is 1.06 in the fiscal year 2062/63 whereas the minimum current ratio is 1.01 in the fiscal year 2067/68. Over the study period the current ratio of STC is not satisfactory because the current ratio is less than standard current ratio 2:1. These current ratios presented in following figure no. 4.2.

Figure: 4.2
Current Ratio



4.1.3 Quick Ratio

Quick ratio measure 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.

Table: 4.3
Quick Ratio

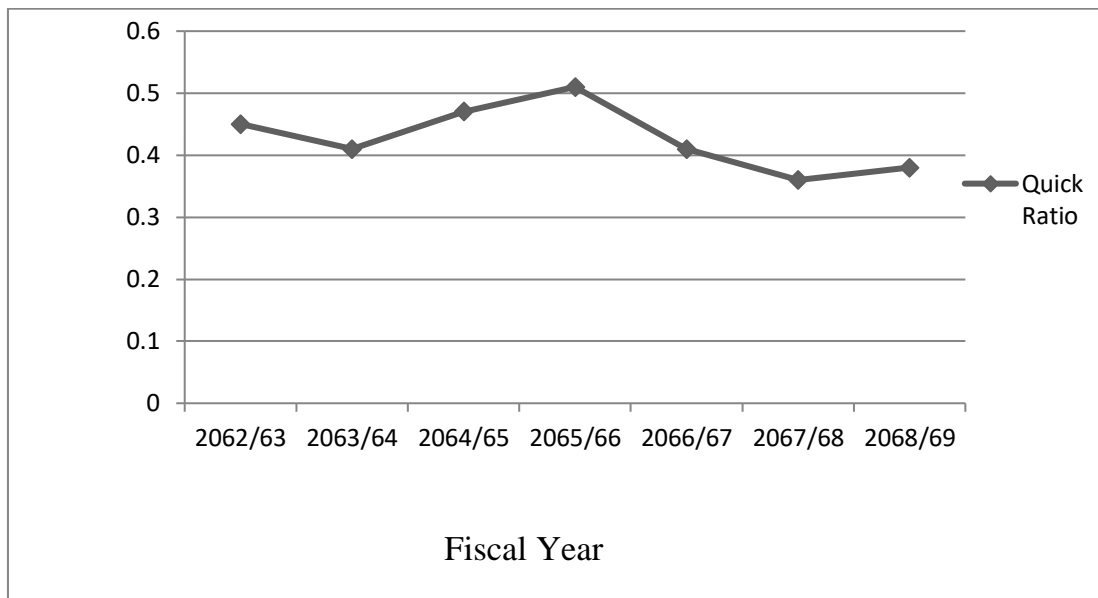
Rs. In Crores

Fiscal Year	Quick Asset	Current Liabilities	Quick Ratio
2062/63	74.69	165.41	0.45
2063/64	76.32	186.50	0.41
2064/65	85.02	182.23	0.47
2065/66	92.90	180.82	0.51
2066/67	100.65	248.51	0.41
2067/68	101.70	284.30	0.36
2068/69	123.64	322.22	0.38

(Source: Annual Report of STC)

The quick ratio is very useful in measuring the liquidity position of the firm. The standard quick ratio is 1:1. Highest ratio is 0.51 in the fiscal year 2065/66 and lowest ratio is 0.36 in the fiscal year 2067/68, which indicate the ability of STC cannot meet its current liabilities in the time. This study shows the ratio is not satisfactory over the whole study period.

Figure: 4.3
Quick Ratio



4.1.4 Inventory to Total Assets Ratio

Inventory to total assets ratio shows the relationship between the inventory and assets. Here, inventories means closing inventories comprising salt, sugar, ghee, oil, rice, cement, etc and equipment and constructing machinery and spare parts. The total assets included the total fixed 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.

Table: 4.4
Inventory to Total Assets Ratio

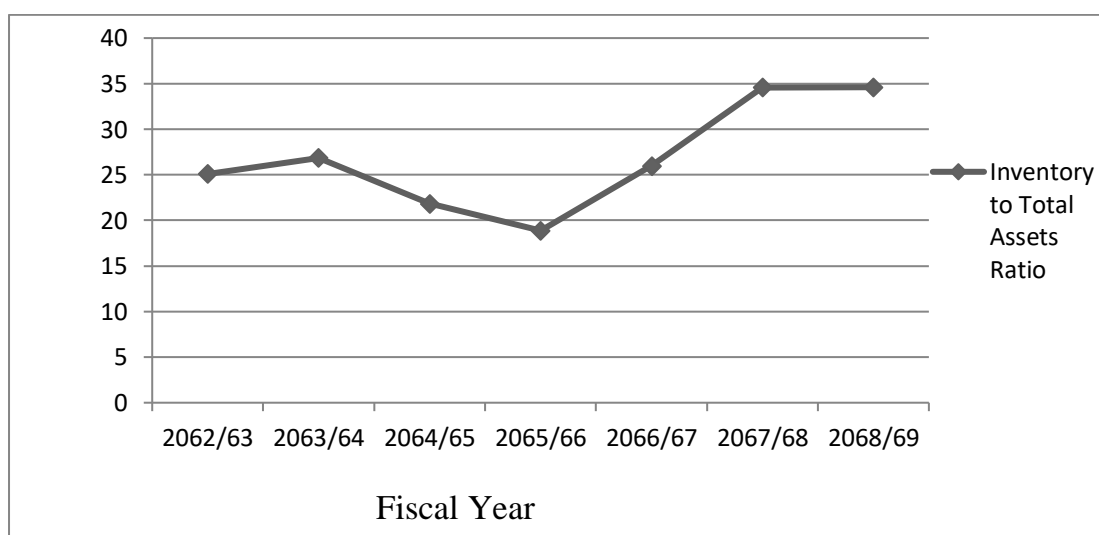
Rs. In Crores

Fiscal Year	Inventory (Rs)	Total Assets(R)	Inventory to Total Assets Ratio (%)
2062/63	78.99	314.41	25.12
2063/64	87.66	326.38	26.86
2064/65	71.45	327.00	21.85
2065/66	61.16	323.90	18.88
2066/67	100.71	387.33	26.00
2067/68	144.75	418.34	34.60
2068/69	157.94	456.32	34.61

Sources: STC Annual Report

The table 4.4, show minimum ratio of inventory to total assets is 18.88 in the fiscal year 2065/66. The maximum inventory to total assets ratio is 34.61 in the fiscal year 2068/69. Taking ratio 25.12% as base ratios of fiscal year 2062/63, 2065/66 and 2066/67 are formed low and satisfactory while inventory to total assets ratio of the fiscal year 2064/65, 2067/68 and 2068/69 are high and unsatisfactory. This table shows that inventories to total assets ratio are not consistent over the study period.

Figure: 4.4
Inventory and Total Asset Ratio



4.1.5 Inventory to Current Assets Ratio

This ratio shows the relationship between inventories and current assets. Current assets include debtors, inventories, prepaid or advance expenses, deposit, cash in hand and cash at bank. High inventories to current asset 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 between the inventories and current assets is efficient inventory management.

Table: 4.5

Inventory to Current Assets Ratio

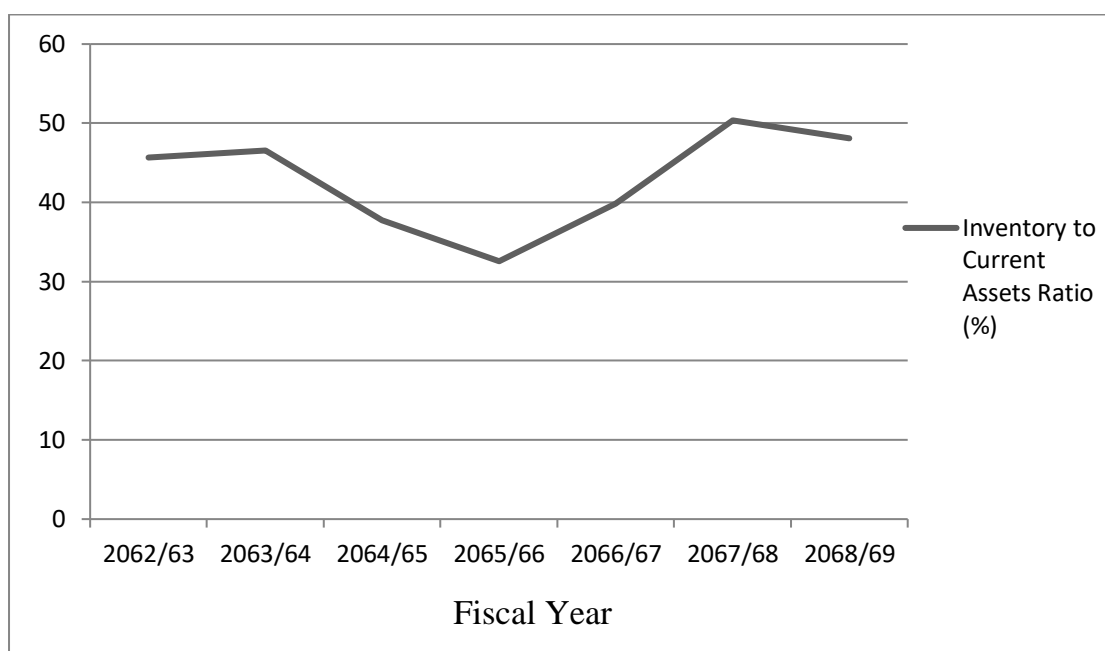
Rs. In Crores

Fiscal Year	Inventory (Rs)	Current Assets(Rs)	Inventory to Current Assets Ratio (%)
2062/63	78.99	175.10	45.68
2063/64	87.66	188.42	46.52
2064/65	71.45	189.20	37.76
2065/66	61.16	187.75	32.57
2066/67	100.71	252.99	39.81
2067/68	144.75	287.45	50.36
2068/69	157.94	328.63	48.06

(Source: Annual Report of STC)

As the inventories to current assets ratio presented in above table 4.5, the inventory management of STC is not efficient. There is more fluctuation in the ratio. The highest and lowest ratios of STC are 50.36% and 32.57% respectively in the fiscal year of 2067/68 and 2065/66. Taking ratio of 37.76% as basic ratio in the fiscal year 2064/65, the inventory to current assets ratio in fiscal year 2065/66 formed low and satisfactory because decrease in inventory. But the ratios of the rest year were higher and not satisfactory. The ratios in the fiscal year 2066/67 and 2067/68 has been increase due to increase in inventory level but in the last year the ratio decrease due to increase in current assets.

Figure: 4.5
Inventory to Current Assets Ratio



4.1.6 Inventory to Net Profit Ratio

Large quantity of inventories indicates low sales, and low sales generate low profit this represent the quantity of inventories to generate a good profit of the corporation. STC's accounting figure of net profit pattern for seven year study period presented in the following table.

Table: 4.6
Inventory to Net Profit Ratio

Rs. In Crores

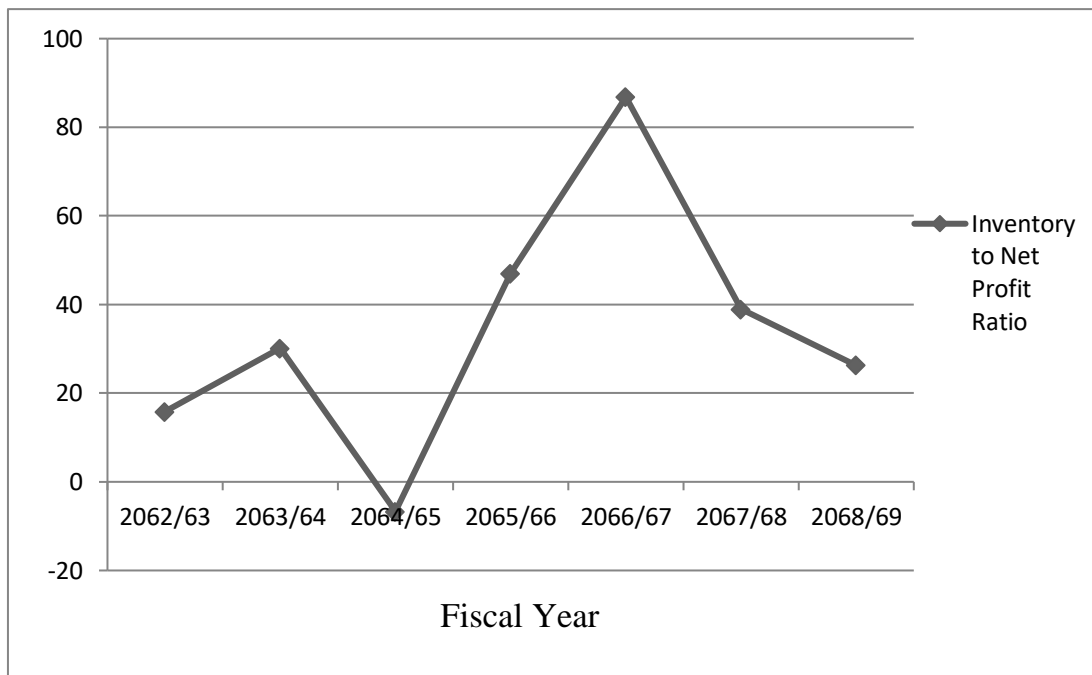
Fiscal Year	Inventory (Rs)	Net Profit (Rs)	Inventory to Net Profit Ratio
2062/63	78.99	4.98	15.86
2063/64	87.66	2.91	30.12
2064/65	71.45	-10.37	-6.68
2065/66	61.16	1.30	47.05
2066/67	100.71	1.16	86.82
2067/68	144.75	3.72	38.91
2068/69	157.94	6.00	26.32

(Source: Annual Report of STC)

Table 4.6 shows that the corporation is suffered loss in the fiscal year 2064/65. Highest profit about Rs. 6.00 Crore earned by the corporation in the fiscal year 2068/69 and inventories to profit ratio is 26.32. The lowest inventory to net profit ratio is 15.86 in the fiscal year 2062/63 due to increase in net profit. Lowest profit of Rs. 1.16 Crore in the fiscal year 2066/67 shows the highest inventory to net profit ratio about 86.82 due to increase in inventories and decrease in net profit. In the last year inventory to net profit ratio is decrease due to increase in net profit.

Figure: 4.6

Inventory to Net Profit Ratio



4.1.7 Inventory Turnover Ratio (ITR)

Inventory Turnover Ratio (ITR) 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 is 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

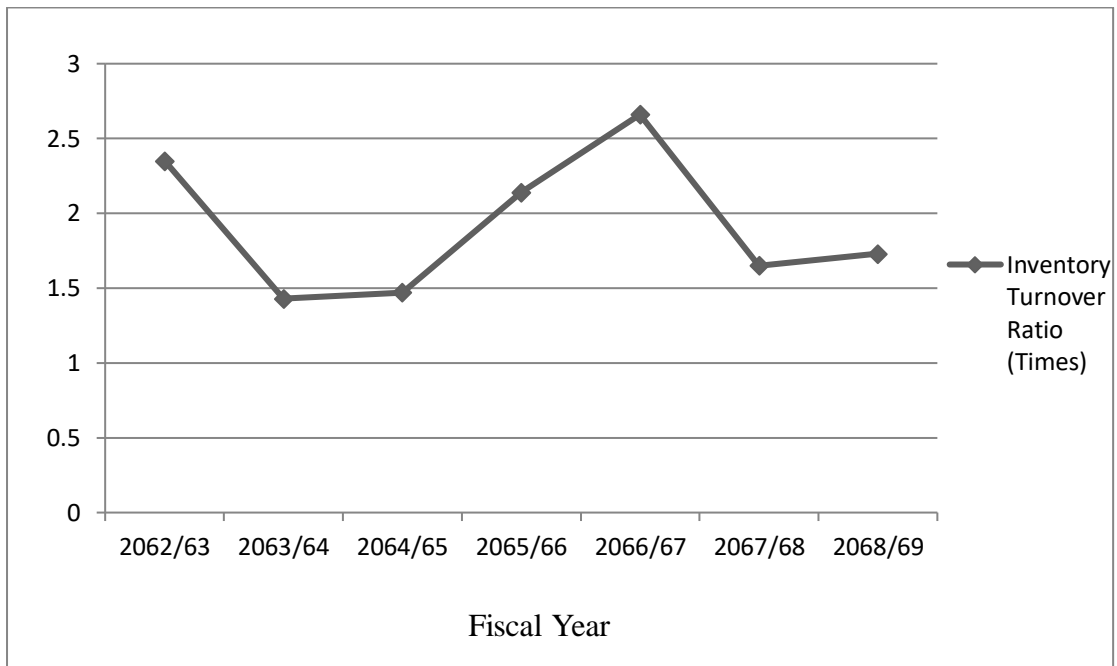
Table: 4.7
Inventory Turnover Ratio

Rs. In Crores

Fiscal Year	Cost of Goods Sold (COGS) (Rs)	Average Inventory (RS)	Inventory Turnover Ratio (Times)
2062/63	147.92	63.03	2.35
2063/64	119.3	83.33	1.43
2064/65	117.04	79.56	1.47
2065/66	142.01	66.31	2.14
2066/67	215.13	80.94	2.66
2067/68	202.32	122.73	1.65
2068/69	261.69	151.35	1.73

The table 4.7 shows that the highest inventories turnover ratio is 2.66 times in the fiscal year 2066/67 due to increased in COGS and lowest inventory turnover ratio 1.43 times in the fiscal year 2063/64 due to decreased in COGS. It represents more inventories are kept in the stock, unnecessary investment tide up on it. The average inventory level decreased but inventory turnover ratio is increased and COGS is also increased in the fiscal year 2066/67.

Figure: 4.7
Trend of Inventory Turnover Ratio



As shown in figure 4.7 the inventory turnover ratios are fluctuating. In the fiscal year 2063/64 this ratio decrease and then after the ratio is increased till 2066/67. Again this ratio decreased in the fiscal year 2067/68 and increased in the fiscal year 2068/69. So the trend of the inventory turnover ratio is not constant.

4.1.8 Inventory Holding Day (IHD)

Inventory holding day (IHD) shows the period that the average inventories hold by the corporation. It represents the how many days the corporation's the average inventories. Detail calculation of cost of goods sold (COGS), average inventories, inventory holding day and mean of inventory holding day of the STC are shown in appendix I, II and III.

Table: 4.8
Inventory Holding Days

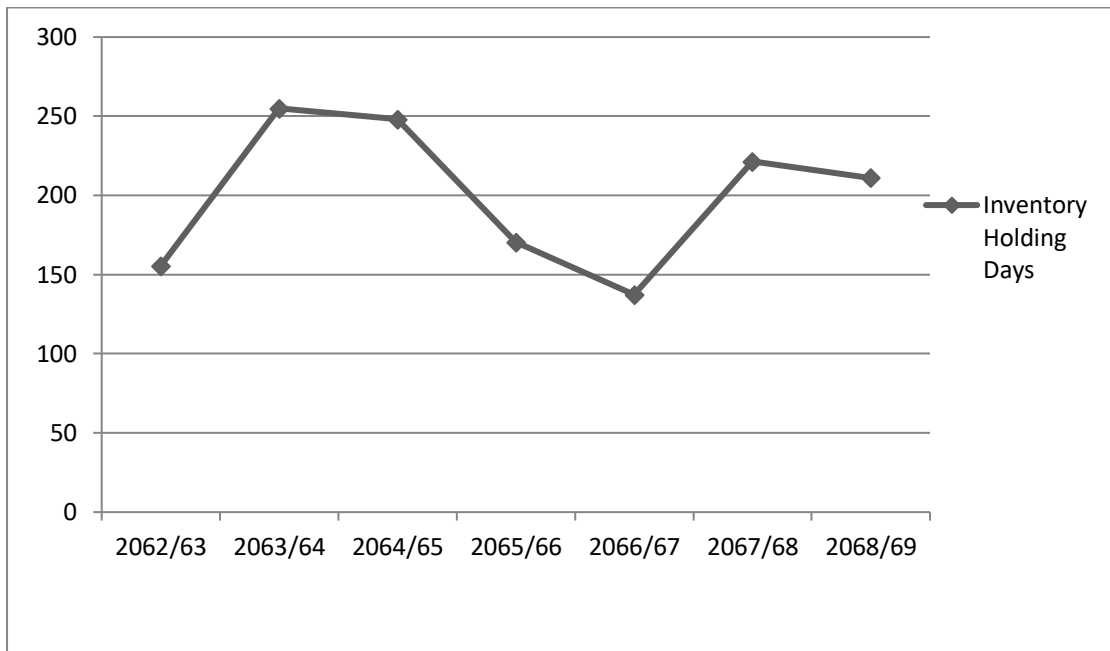
Rs. In Crores

Fiscal Year	Cost of Goods Sold (COGS) (Rs)	Average Inventory (RS)	Inventory Holding Days
2062/63	147.92	63.03	155.53
2063/64	119.30	83.33	255.00
2064/65	117.04	79.56	248.12
2065/66	142.01	66.31	170.43
2066/67	215.13	80.94	137.33
2067/68	202.32	122.73	221.41
2068/69	261.69	151.35	211.10
Mean of Inventory Holding days = 200 Days			

(Source: Annual Reports of STC)

From the table 4.8, average inventories holding days of STC from the fiscal year 2062/63 to 2068/69 is 200 days. In the words, the corporation holds average inventories 200 days in regards of mean in seven fiscal years. In the fiscal year 2062/63, 2065/66 and 2066/67 are less than 200 days, whereas fiscal year 2063/64, 2064/65, 2067/68 and 2068/69 are more than 200 days. Maximum holding days increased the overall carrying cost of the corporation. The trend of inventory holding period is presented in following figure 4.8.

Figure: 4.8
Inventory Holding days



4.1.9 Relationship between Inventory and Cash Flow

Cash flow represents 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 direct affect the cash flow from operating activities. The following table 4.9 is prepared to found the affect of inventory in operating activities. Cash flow from operating activities before and after adjusting inventory was shown.

Table: 4.9
Effects of Change of Inventory in Cash Flow

Rs. In Crores

Fiscal Year	Cash Flow Before adjustment of Inventory (Rs)	Change in Inventory(Rs)
2062/63	-1.88	31.92 (Increase)
2063/64	6.25	8.67 (Increase)
2064/65	20.99	16.21 (Decrease)
2065/66	21.20	10.29 (Decrease)
2066/67	-20.69	39.55 (Increase)
2067/68	23.55	44.04 (Increase)
2068/69	19.07	13.19 (Increase)

(Source: Annual Reports of STC)

4.1.10 Trend Analysis

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

4.1.10.1 Trend Analysis of Net Sales and Inventory

The following table represents the net sales and inventories of STC through the fiscal year 2062/63 to 2068/69.

Table: 4.10
Net Sales and Inventory

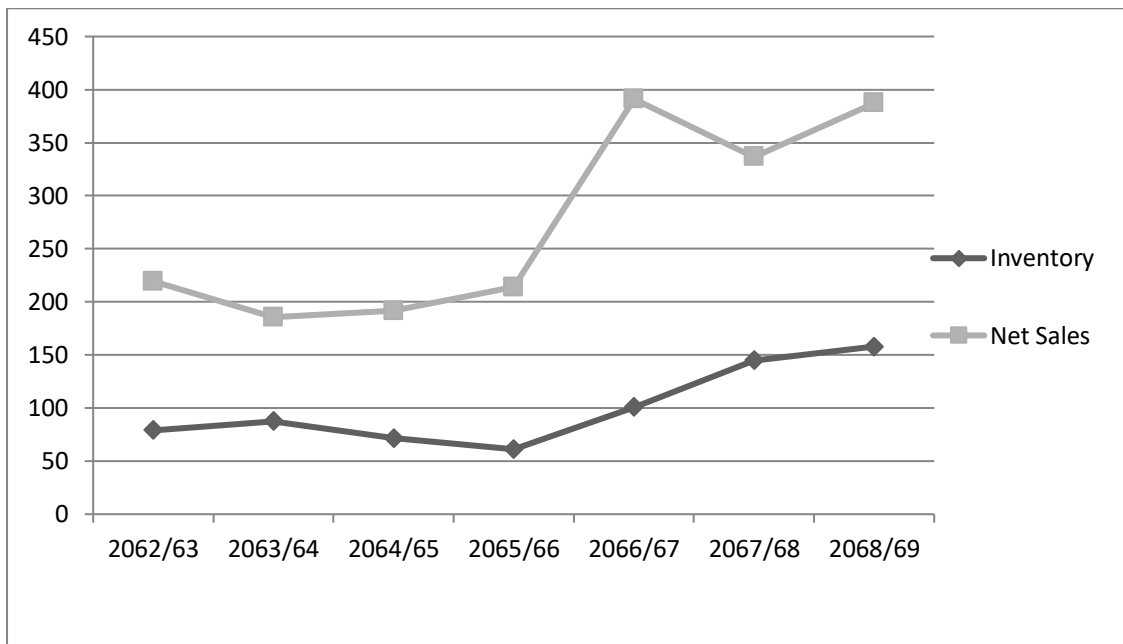
Rs. In Crores

Fiscal Year	Net Sales(Rs)	Inventory (Rs)
2062/63	219.40	78.99
2063/64	185.06	87.66
2064/65	191.62	71.45
2065/66	213.90	61.16
2066/67	391.05	100.71
2067/68	336.64	144.75
2068/69	387.41	157.94

(Source: Annual Reports of STC)

Table 4.10 shows that the level of total net sales and inventories of different fiscal year. Both of them are changing over the same pattern. Net sales are decreased to 185.06 from 219.40 in the fiscal year 2063/64 and then started to increase. Net sales are decreased to 336.64 from 391.05 in the fiscal year 2067/68 and then also increased in the last year. On the other hand same fluctuating trend occurs in inventory level too. Level of inventory is increased and decreased severally. Inventory is slightly declined in the fiscal year 2065/66 but go up till the fiscal year 2068/69. Both of them are shown in Figure 4.10 in more clearly.

Figure: 4.9
Trend of Net Sales and Inventory



In order to find the variability of net sales and inventory of different fiscal year, the statistical tools like mean, standard deviation and co-variance are calculated. The detail calculation is shown in appendix IV. It can be presented in the table 4.10.

Table: 4.11
Relationship between Net Sales and Inventory

Rs. In Crores

Statistical Tool	Net Sales (Rs)	Inventory (Rs)
Mean	275.01	100.38
Standard Deviation (S.D)	86.00	34.40
Co-efficient of Variation (C.V)	31.27%	34.26%

Table 1.44 shows mean Standard deviation and coefficient of variation of net Sales and inventories. Mean of net sales and inventories in the seven years are 275.01 and 100.38, standard deviations are 86.00 and 34.40 and coefficients of variation are 31.27% and 34.26% respectively. The coefficient of variance of inventories is higher than the coefficient of variance of net sales. So, the variability of inventories is higher than the net sales or there are less uniform and consistency of inventory.

4.1.10.2 Trend Analysis of Purchase and Inventory

The following table shows that the purchase and inventories of STC throughout the fiscal year 2062/63 to 2068/69.

Table: 4.12
Trend of Purchase and Inventory

Rs. In Crores

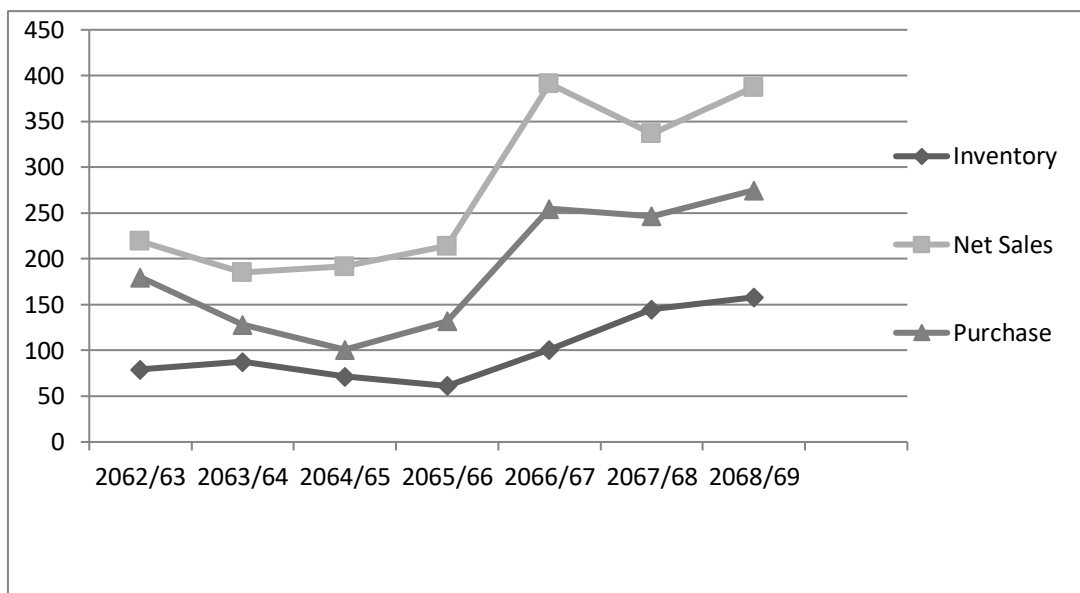
Fiscal Year	Purchase(Y)	Inventory (X)
2062/63	179.84	78.99
2063/64	127.97	87.66
2064/65	100.83	71.45
2065/66	131.72	61.16
2066/67	254.68	100.71
2067/68	246.36	144.75
2068/69	274.88	157.94

(Source: Annual Report of STC)

From the study of the above table 4.12 shows the procurement trend of STC is fluctuating every year. Highest purchase is 274.88 in the fiscal year 2068/69 and lowest purchase is 100.83 in the fiscal year 2064/65. In the fiscal year 2063/64 the purchase is decreased but the inventory level is increase but in the fiscal year 2064/65 purchase is decrease but inventory level is also decreased. The inventory level is increasing ratio from the fiscal year 2065/66. Trend of purchase, net sales and inventory is shown in following figure 4.10.

Figure: 4.10

Trend of Purchase, Net Sales and Inventory



In the above figure 4.10 relationship between purchases, net sales and inventory are shown. In the fiscal year 2063/64 both purchase and net sales are decrease but inventory is increase. In the fiscal year 2064/65 both inventory and purchase are decrease but net sales are increase. From the fiscal year 2064/65 the net sales and purchase are increase up to 2066/67 than decreased. The inventory is decrease up to fiscal year 2065/66 then increased. In the last year net sales, purchase and inventory are increasing trend.

In order to find the variability of purchase and inventory of different fiscal year, the statistical tools like mean, standard deviation and co-variance are calculated. The detail calculation is shown in appendix V. It can be presented in the table 4.13

Table: 4.13**Relationship between Purchase and Inventories**

(Rs. In Crores)

Statistical Tool	Purchase	Inventory (Rs)
Mean	188.13	100.38
Standard Deviation (S.D)	65.04	34.40
Co-efficient of Variation (C.V)	34.57%	34.26%

Table 4.13 shows mean, standard deviation and coefficient of variation and inventory. Mean of purchase and inventories of seven fiscal year are 188.13 and 100.38, standard deviations are 65.04 and 34.40 and coefficients of variations are 34.57% and 34.26% respectively. The coefficient of variation of purchase is higher than the coefficient of variance of inventory. So the variability of purchase is higher than the inventory.

4.1.10.3 Trend Analysis of Net Profit and Inventory

The following tables shows that the net profit and inventories of STC through 2062/63 2068/69.

Table: 4.14**Trend of Net Profit and Inventory****Rs. In Crores**

Fiscal Year	Net Profit(Rs.)	Inventory (Rs.)
2062/63	4.98	78.99
2063/64	2.91	87.66
2064/65	-10.37	71.45
2065/66	1.30	61.16
2066/67	1.16	100.71
2067/68	3.72	144.75
2068/69	6.00	157.94

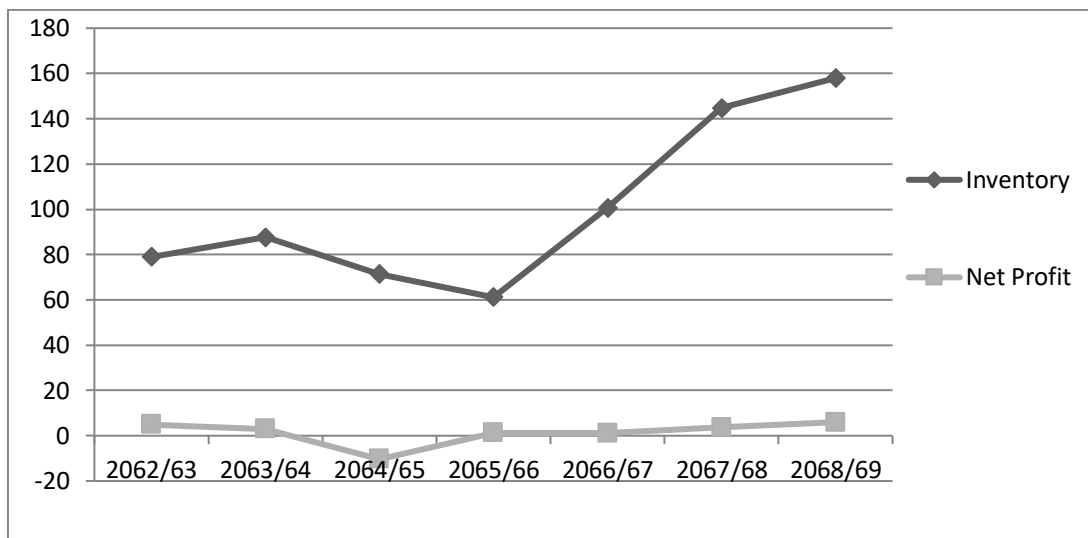
(Source: Annual Report of STC)

The table 1.14 shows the negative net profit in the fiscal year 2064/65. The highest net profit is 6.00 Crore in the fiscal year 2068/69 and lowest net profit is 1.16 Crore in

the fiscal year 2065/66. On the other side, inventories are fluctuating severally. The fluctuating trend of net profit and inventory is shown in the following figure 4.11.

Figure: 4.11

Trend of Net Profit and Inventory



In the figure 4.11 shows the trend of net profit and inventory. The trend of net profit is less fluctuated then of inventory. Figure indicates that increase or decreased inventory level did not directly affect the net profit.

In order to find the variability of net profit and inventory of different fiscal year, the statistical tools like mean, standard deviation and co-variance are calculated. The detail calculation is shown in appendix VI. It can be presented in the table 4.15

Table: 4.15

Relationship between Net Profit and Inventory

(Rs. In Crores)

Statistical Tool	Net Profit (Rs)	Inventory (Rs)
Mean	1.39	100.38
Standard Deviation (S.D)	5.077	34.40
Co-efficient of Variation (C.V)	365.24%	34.26%

Table 4.15 shows mean, standard deviation and co-efficient of variation on net profit and inventory. Mean of net profit and inventory is the seven fiscal year are 1.39 and

100.38, standard deviation is are 5.077 and 34.40 and co-efficient of variance are 365.24% and 34.26% respectively. The co-efficient of variance of net profit is higher i.e. 365.24% than the co-efficient of variance of inventory i.e. 34.26%. So, the variability of net profit is higher than the inventories.

4.1.10.4 Trend Analysis of Net Sales and Purchase

The following table shows that the net sales and purchase of STC through the fiscal year 2062/63 to 2068/69.

Table 4.16
Net Sales and Purchase

Rs. In Crores

Fiscal Year	Net Sales(Rs)	Purchase(Rs)
2062/63	219.4	179.84
2063/64	185.06	127.97
2064/65	191.62	100.83
2065/66	213.9	131.72
2066/67	391.05	254.68
2067/68	336.64	246.36
2068/69	387.41	274.88

The net sales is decreased 185.06 from 219.40 in the fiscal year 2063/64 then going up year by year till the 2066/67 after the fiscal year 2063/64. But in the fiscal year 2067/68 sales is decreased again increased in the fiscal year 2068/69. Similarly the purchase is decreased year by year till the fiscal year 2064/65 then started to increase till 2066/67. But in the fiscal year 2067/68 the purchase are decrease again increased in the fiscal year 2068/69. Above table shows the increase and decreased in purchase and sales are in same trend except the year 2064/65. Sales are increased when the purchases are increased and vice versa. Their trends are shown in figure 4.12 more clearly.

Figure: 4.12

Trend of Net Sales and Purchase

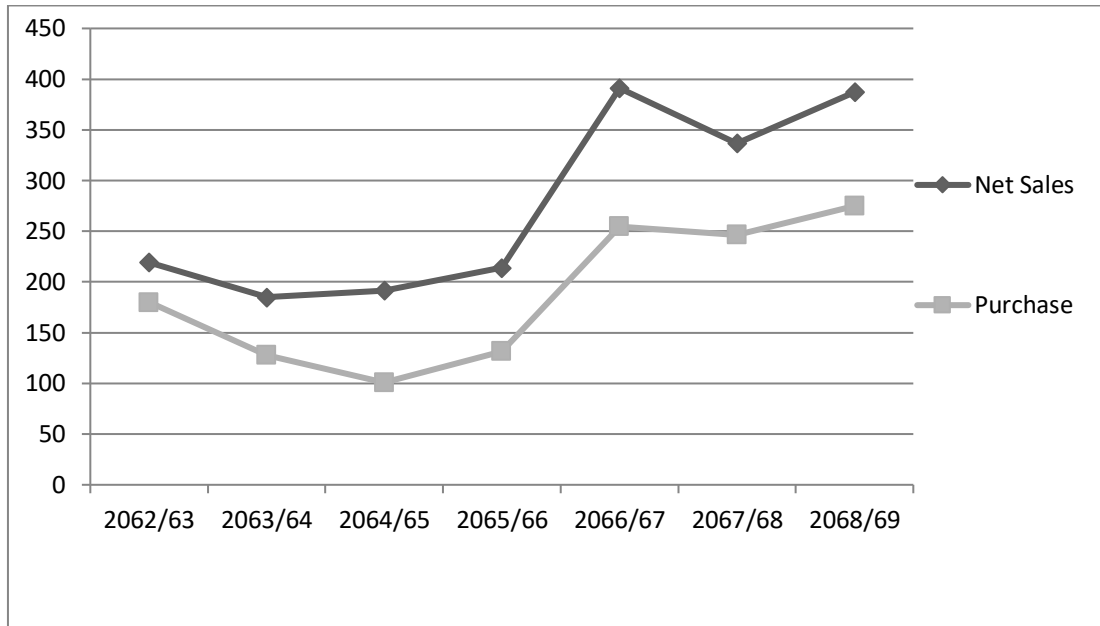


Figure no 4.12 shows the net sales and purchase of various periods. The trend indicates positive relation between purchase and sales. Purchase increase as sales increase and decreased as it decreased except the fiscal year 2064/65. Sales and purchase both are higher in the fiscal year 2066/67 over the study period. Purchase and sales are severally fluctuating over the study period.

In order to find the variability of net sales and purchase of different fiscal year, the statistical tools like mean, standard deviation and co-variance are calculated. The detail calculation is shown in appendix VII. It can be presented in the table 4.17.

Table: 4.17

Relationship between Net Sales and Purchase

Rs. In Crores

Statistical Tool	Net Sales (Rs)	Purchase (Rs)
Mean	275.01	188.13
Standard Deviation (S.D)	86.00	65.04
Co-efficient of Variation (C.V)	31.27%	34.57%

Table 4.17 shows mean, standard deviation and co-efficient of variation of net sales and purchase. Mean of net sales and purchase in the seven fiscal year 275.01 and 188.13 and standard deviation are 86.00 and 65.04 and co-efficient of variance are 31.27% and 34.57% respectively. The co-efficient of variance of purchase is higher than the co-efficient of variance of net sales. So, the variability of purchase is higher but uniformity and consistency is lesser than the net sales.

4.1.10.5 Trend Analysis of Cash Flow and Inventory

The following table shows the cash flow and inventories of STC through the fiscal year 2062/63 to 2068/69. The table shows the level of increase and decreased quantity of inventory.

Table: 4.18
Cash Flow and Change in Inventory

Rs. In Crores

Fiscal Year	Cash Flow (Rs)	Opening Inventory (Rs)	Closing Inventory (Rs)	Change in Inventory (Rs)	Remarks
2062/63	-2.49	47.07	78.99	-31.92	Increased
2063/64	1.34	78.99	87.66	-8.67	Increased
2064/65	1.52	87.66	71.45	16.21	Decreased
2065/66	-1.73	71.45	61.16	10.29	Decreased
2066/67	4.77	61.16	100.71	-39.55	Increased
2067/68	-3.95	100.71	144.75	-44.04	Increased
2068/69	4.64	144.75	157.94	-13.19	Increased

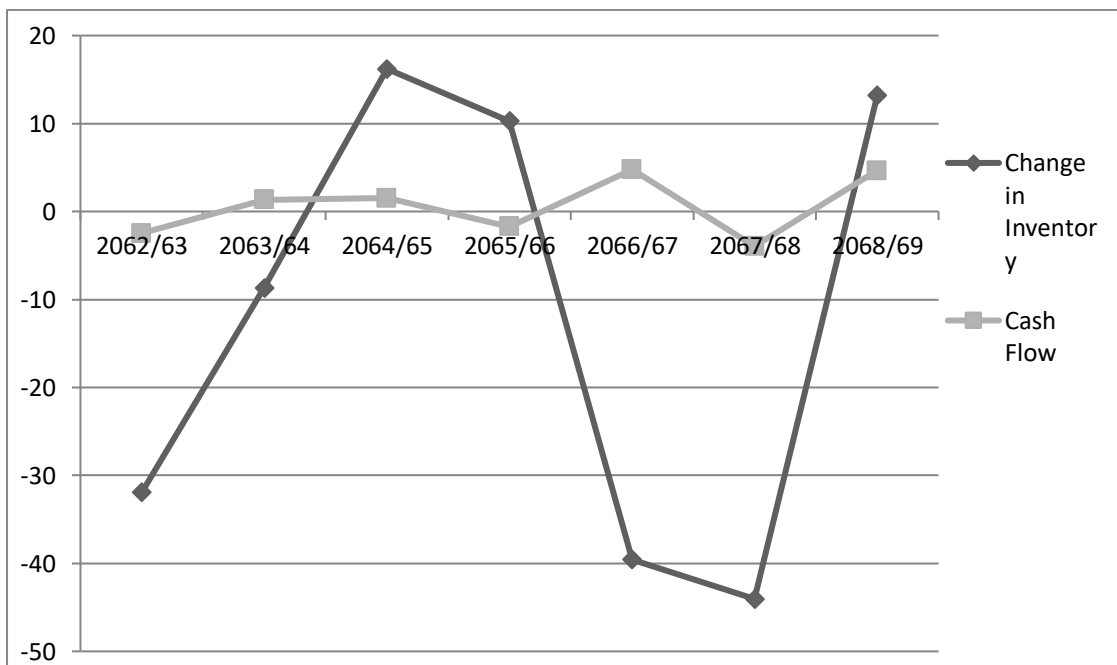
(Source: Annual Report of STC)

The table 4.18 shows in the fluctuating trend of cash flows and changed in inventory level. Trend of cash flow is very fluctuating. Table shows the cash flow of three years is negative and remaining four years is positive. Cash flow shown in table is total cash inflow and outflow. Negative cash flow represents the cash outflow and positive cash flow represents the cash inflow. Minimum cash outflow is 1.73 Crore in the fiscal year 2065/66 when inventory level is decreased by 10.29 Crore. Maximum cash

outflow is 3.95 Crore in the fiscal year 2067/68 when the inventory level is increased by 44.04 Crore. Maximum cash inflow is 4.77 Crore in the fiscal year 2066/67 and minimum cash inflow is 1.34 Crore in the fiscal year 2063/64. Inventory level increased by 8.67 Crore in the fiscal year 2063/64 and 39.55 Crore in the fiscal year 2066/67. From the above table it can be concluded that inventory level directly affects the cash inflow and outflow. Their trends are shown in figure 4.13 more clearly.

Figure: 4.13

Cash Flow and Cash Change in Inventory



4.1.11 Sales Plan of Salt Trading Corporation Limited

A sales planning process is the major part of profit planning and control because it provides the basic management decision about marketing as well as provides ground for other budgets. It is an organized approach for developing the sale plan. Sales plan should be realistic. Salt trading corporation limited does not have long range and short range sales plan. It hasn't properly maintained the annual sales budget. Therefore, actual sales value has been analyzed. Sales value means total monetary value of unit sold by salt trading corporation limited.

Table 4.19
Sales Revenue

(Amount in Rs.)

Fiscal Year	Sales Revenue	% change
2063/64	1851702406	----
2064/65	1916218180	3.484133
2065/66	2138957424	11.6239
2066/67	3190432746	49.15831
2067/68	3366335450	5.513443
2068/69	3874061721	15.08246

Source: Annual Report of STC

The sales value of salt trading corporation limited has increasing from the fiscal year 2063/64 to 2067/68 but we can see sales percentage has been fluctuating from the fiscal year 2065/66 to 2068/69 and even that the increasing rate has gone slightly up.

There are various reasons which cause the variation on sales revenue. The significant factors responsible for the variation in sales revenue are demand condition of the product, cost of products, political conflict, transitional period & socio-political condition of the country, government policy, tough competition with imported product etc. National and international reason also causes for fluctuating sales value.

In the fiscal year 2064/65 the total revenue collection by salt trading corporation is Rs. 1916218180 which is increased by 3.4831 percent of previous year of 2063/64. But in the year 2065/66 sales revenue collected by salt trading corporation is increased continuously by 11.62, 49.15, 5.51 and 15.08 percent as respectively. Therefore the above mentioned fact clearly shows that the sales revenue of the corporation is unstable.

To analyze the trend of actual sales, least square method can be used to estimate the possible future sales for given time or year. A straight line trend will show the

relationship between time period and actual sales of the relevant year. In this method, it is assumed that the changes in sales revenue in consistent way as previous year. In this method, time factor is considered as independent factor and sales is considered as dependent factor upon time. The straight line trend of actual sales (y) depends upon the time (x) which is expressed as:

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

$$\sum y = na + b\sum x \dots\dots\dots (i)$$

$$\sum xy = a\sum x + b\sum x^2 \dots\dots (ii)$$

Table 4.20
Time Series Analysis
Fitting Straight Line Trend by Least Square Method

Fiscal Year	Actual Sales(Y) (in Rs.)	X(Base Year 2066/67)	x²	XY
2064/65	1916218180	-2	4	-3832436360
2064/65	2138957424	-1	1	-2138957424
2066/67	3190432746	0	0	0
2067/68	3366335450	1	1	3366335450
2068/69	3874061721	2	4	7748123442
	$\sum y =$ 14486005521	0	$\sum x^2 = 10$	$\sum xy = 5143065108$

Therefore, $a = 2897201104$ and $b = 514306510.8$

Thus, $y = 2897201104 + 514306510.8x$, is the trend of sales figure which shows the positive sales revenue in the future. By using this trend equation we can estimate the actual sales, for the year 2068/69. $y = 2897201104 + 514306510.8 \times 6 = 5983040169$.

Therefore, if the trend does not change, the possible sales for the year 2068/69 will be Rs. 5983040169.

Table 4.21
Forecasted Sales

(Amount in Rs.)

Fiscal Year	a	B	x	Sales Forecasted
2069/70	2897201104	514306510.8	6	5983040169
2070/71	2897201104	514306510.8	7	6497346680
2071/72	2897201104	514306510.8	8	7011653190
2072/73	2897201104	514306510.8	9	7525959701
2073/74	2897201104	514306510.8	10	8040266212

4.1.12 Variable Cost Analysis of Salt Trading Corporation Limited

Variable costs which increase directly and proportionately with the increment in production unit are called variable costs. A variable cost is changed in the same proportion due to change into production volume. If other thing remains constant, variable cost per unit is not changed. But total variable cost is changed due to changing in production volume. Variable cost per unit is constant within the one fiscal year. Variable cost per unit are varies for different fiscal year affected by internal and external environment of the company. According to the company's costs detail sheet, separate the following variable cost by nature and used of them.

Table 4.22
Variable Costs Analysis of STCL

(Amount in Rs.)

Details	2064/65	2065/66	2066/67	2067/68	2068/69
1. Cost of Sales	1644540991	1837630785	2813514025	2846981343	3223898614
Total cost of sales (a) (70%)	1151178694	1286341550	1969459818	1992886940	2256729030
2. Administration Cost(b)					
Salary	36030922	49077476	52987869	68368634	75748221
Salaries and allowance (70%)	25221645.4	34354233.2	37091508.3	47858043.8	53023754.7
TADA	6133277	5030640	10472556	10682336	11073027
Ticket and telephone	2941791	3059448	3170962	3532961	3890676
Stationery expenses	1849461	1636773	1395578	2074648	2948347
Petrol expenses	3042708	2952908	3858293	4024889	4582361
Cloths allowances	386573	358933	2246027	2107700	2419400
Anniversary expenses	301218	414438	460937	549660	764779
Books and newspaper	495199	775511	263481	273254	340913
Charity expenses	1352938	1570970	2846820	4179416	5829878
Consultancy fees	539718	647488	1032970	2982957	2694166
Training expenses		680324	208635	803684	664546
General assembly	0	125909	126246	313772	490014
Meeting allowances	1991277	1644618	1930776	2636794	1352465
Worshipping expenses	1084478	366125	534300	330170	762070
Hosting expenses	1991277	1644618	1170886	2821736	1259389
Water and electricity (70%)	1237728	1114871	1143381	1403522	2070917
Misc. expenses	0	465672	334295	49530	221995
Overwriting	5630634	0	0	7278200	2460000
Fees and tax	2566177	914678	2866997	3769565	2910273
Total administration cost	56766099.4	57758157.2	71154648.3	97672855.8	175507191
Total a+b	1207944793	1344099707	2040614466	2090559796	2432236221
Change %	5.333253	11.271617	51.82017	2.447563	19.191364

Source: Annual Report of STC

Above table 4.22 shows that there is variation in variable cost of sales, administrative cost for different years. Because various factors effected to these cost from different angle. All these variable costs are fluctuated trend. In the above table also shows that salaries and allowances, TA-DA, petrol expenses, ticket and telephone, stationary expenses, consultancy fees, meeting allowances, hosting expenses, water and electricity expenses, fees and tax, books and newspaper cost contribute to increase amount of variable administrative cost for every year. Similarly variable cost of sales also contributes to increase amount of variable cost every year.

Total variable cost amount increase by 51.82 percent, 2.44 percent, 19.19 percent in the years, 2065/66, 2066/67, 2067/68, respectively than the last based years. Mainly, cost of sales contributes to increase amount of total variable costs.

4.1.13 Fixed Costs Analysis

Those costs which do not change due to changing in to production units is known as fixed costs. Such costs remain constant in total amount and are unaffected by changing into production units. Main features of fixed costs are:

- The fixed costs are not changed due to change into production unit.
- Fixed cost per unit is changeable due to change into production units.
- Fixed cost cannot be controlled by the manager.

But fixed cost in total may vary for different fiscal year. The fixed cost of STCL is presented in the table below:

Table 4.23
Fixed Costs Analysis

(Amount in Rs)

Fixed Cost Analysis of STC					
Details	2064/65	2065/66	2066/67	2067/68	2068/69
1. Cost of sales	1644540991	1837630785	2813514025	2846981343	3223898614
cost of sale 30%	493362297.3	551289235.5	844054207.5	854094402.9	967169584.2
2. Administration cost(b)					
Salaries	36030922	49077476	52987869	68368634	75748221
Salaries and allowance(30%)	10809276.6	14723242.8	15896360.7	20510590.2	22724466.3
Medical expenses	2478910	3379939	4180938	6125540	7672547
Maintenance expenses	1970729	3512649	3983071	5030400	7233847
water & electricity	371318.4	334461.3	343014.3	421056.6	887535.3
House rent	5013838	5779363	7022272	9050352	7801225
Bank commission	539781	647488	1032970	2982957	2694166
House & land tax	626188	1155936	951632	870317	2121565
Insurance	5919969	9789776	14889497	17114649	21106634
audit fees	161500	177650	195500	215050	215050
Bribe expense	44100		12546014	20902989	62203358
Total(b)	27935610	39500505.1	61041269	83223900.8	210408614.6
Selling and distribution cost(c)					
Advertisement	495199	775511	1134246	1788552	3207162
sales promotion	5670476	5375836	8459469	12024866	12544199
Total©	6165675	6151347	9593715	13813418	15751361
Other fixed cost					
Depreciation	4275438	5169703	7064647	7719126	7287132
Interest	161188663	152956369	197195114	260201790	294577494
Total(d)	165464101	158126072	204259761	267920916	301864626
Total fixed cost	692927683.3	755067159.6	1118948953	1219052638	1295194186

Source: Annual Report of STC

In the above table 4.23 there is increasing in fixed costs. This variation is caused by the variation of cost of sales, administrative cost, selling and distribution cost and other fixed costs namely depreciation and interest.

The above table 4.23 reveals, administrative cost is increased in the FY 2063/64 to 2068/69 continuously. Selling and distribution cost is near to state on FY 2063/64 and 2064/2065 as compared with previous year and then after from year from 2065/66 is increasing. The other fixed costs namely depreciation and interest are also increasing trend but in year 2068/69 depreciation is decreased from Rs.7719126 to Rs.7287132.

4.1.14 Profitability Ratio Analysis of STCL

An arithmetical relationship between two figures is known as 'ratio.' it is computed by dividing one item of relationship with the other. Ratio analysis is technique of analysis and interpretation of financial statement. To evaluate the performance of an organization by creating the ratio form the figures of different accounts consisting in balance sheet and income statement is known as ratio analysis.

Ratio can be classified into four broad groups. One of them, profitability ratio shows the overall efficiency of all business concerns. The relation of the return of the firm to either its sales or its equity or its assets is known as profitability ratios. Profitability ratios are two types, profitability in relation to sales and profitability in relation to investment. But this analysis concerns only with profitability in relation to sales.

Gross profit is the amount left after deducting cost of sales from total sales revenue. The operating profit of the corporation has been derived after adding gross profit with other income and then deducting administrative cost.

The net operating profit of the industry is calculated by subtracting interest and depreciation expenses from operating profit.

Table 4.24
Profitability Analysis of Salt Trading Corporation Limited

Fiscal Year	Sales(1) (in Rs.)	Net Operating Profit(2) (in Rs.)	% of Sales(2/1)
2064/65	1916218180	41759056	2.1792433
2065/66	2138957424	54635534	2.5543068
2066/67	3190432746	58409685	1.8307763
2067/68	3366335450	103986682	3.0890172
2068/69	3874061721	150546510	3.8860122

Source: Annual Report of Salt Trading Corporation

Above table 4.24 shows that the percentage change in sales in the year 2064/65 has gone 2.17 percent which is nearly equal to year 2065/66. In the year the 2066/67 the percentage in sales decreased to 1.83 percent due to net operating profit very slightly increased rather than the sales. In the year 2066/67 and 2067/68 percentage change in sales also nearly equal which has gone to 3 percent. Comparative profitability ratio analysis for the FY 2066/67 to 2068/69.

Table 4.25
Income Statement for the Fiscal Year 2067/68 and 2068/69

(Amount in Rs.)

Particular	Amount(Rs) 2067/68	Amount(Rs) 2068/69
Sales revenue	3366335450	3874061721
Less: cost sales	2846981343	3223898614
Gross profit	518354107	650163107
Add: other incomes	47146529	51033585
Total gross profit including other income	565500636	701196692
Less: Administrative expenses	193593038	248785556
Operating income	371907598	452411136
Less: Other fixed cost:		
Depreciation	260201790	294577494
Interest	7719126	7287132
Net operating incomes	103986682	150546510
Add: Profit on sale of assets	1287081	75632
Profit before tax and bonus	105273763	150622142
Less: Bonus	6393586	9851265
Profit before tax and advance	98880177	140770877
Less; advance	34944314	42258224
Profit before Tax	63935863	98512653
Less: Tax	27753494	52324899
Add Deferred tax	(968651)	(13815343)
Net profit	37151020	60003097

Source: Annual Report of Salt Trading Corporation

4.1.15 Gross Profit Margin Ratio

Gross profit margin ratio expresses the relationship between gross profit margin and sales amount. A firm should have a reasonable gross profit margin to ensure adequate coverage for operating expenses of the firm and sufficient return to the owners of the business. Gross profit margin ratio can be expressed by the following formula:

$$\text{Gross Profit Margin Ratio} = \frac{\text{Gross profit}}{\text{Sales}}$$

$$\begin{aligned}\text{Gross profit margin ratio for the fiscal year (2067/68)} &= \frac{518354107}{3366335450} \\ &= 15.3\%\end{aligned}$$

$$\begin{aligned}\text{Gross profit margin ratio for the fiscal year (2068/69)} &= \frac{650163107}{3874061721} \\ &= 16.78\%\end{aligned}$$

A higher ratio is a sign of good management. A low gross profit ratio is definitely a dangerous signal, requiring a careful and detailed analysis of the factors responsible for it.

Gross profit margin ratio of corporation for the fiscal year 2068/69 is higher than the fiscal year 2067/68 since it is a sign of good management as it implies that the cost of sales of corporation is relatively low.

4.1.16 Net Profit Margin Ratio

This ratio measures the overall profitability of the firm by establishing relationship between net profit and sales. The relationship between net profit and sales indicates management's ability to operate the business with sufficient success not only to cover the cost of production, operating expenses of business and cost of borrowed fund but also to leave a margin of reasonable compensation to the owners for providing their capital at risk. This ratio is calculated by dividing net profit after tax and interest by sales.

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

On the basis of fiscal year 2067/68, the company's net profit margin ratio is 0.36 percent. But for the fiscal year 2068/69, the company's ratio is 1.10 percent which is greater than the previous fiscal year's ratio. It indicates that, at present company's overall efficiency is better than previous fiscal year from the net profit margin view.

$$\text{Net profit margin ratio for the fiscal year (2067/68)} = \frac{37151020}{3366335450} = 1.10$$

$$\text{Net profit margin ratio for the fiscal year (2068/69)} = \frac{60003097}{3874061721} = 1.55$$

4.2 Major findings

Major findings from the research are explained below.

- Corporation applied ABC and EOQ techniques of inventory management; however it is applied ineffectively and unsystematically.
- Mean of inventory to current ratio is 42.96%. It indicates that the company had not been adopting appropriate inventory policy.
- Over the study period current ratio of STC is not satisfactory. The current ratio is less than standard.
- Quick ratio of the STC is also lower than standard ratio i.e.1:1.
- General 18% to 34% range of inventory from than total assets considered as good from the study. It has been shown inventory to total assets is good position
- Net profit of the organization is not satisfactory. Company faced the loss amounted Rs. 10.37 Crore in the fiscal year 2065/66.
- Inventory turnover ratio is fluctuating severally over the study period.
- Mean inventory holding day is 200 days. Highest IHD is 255 days in the fiscal year 2064/65 and lowest IHD is 137 days in the fiscal year 2067/68.
- The net sales and purchase are more uniformity and consistency. And variability of purchase is higher than net sales.
- In case of net profit mean and S.D. are 1.39 and 5.077.which are lower than mean and S.D. of inventory. Whereas coefficient of variation of net profit is 365.24% very higher then CV of inventory. So, the uniformity and consistency of net profit is lower.
- The Sales plan of salt trading corporation is unstable.
- The corporation's variable costs is high proportion than fixed cost in total cost amount, which contributes for lower contribution margin.

- Salt trading corporation does not practice the scientific appropriate cost classification technique. So it is difficult to use financial tools such as degree of operating leverage, CVP, flexible budget etc.
- Financial position of corporation is satisfactory as compared to previous year but net profit margin, profitability ratio and other things are not satisfactory.

CHAPTER - V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Public enterprises play crucial role in Nepalese economy. One can feel the presence of public enterprises in almost all the key sectors particularly in trade sector of the economy as well. STC is merchandising enterprise its main objectives is maintaining high quality consumer goods at reasonable price, easily available system in the Kingdom throughout the year and prevention the dealings of the goods affecting public health is characteristics and commitment of Salt Trading Corporation.

STC was established four decades ago through the joint efforts Nepal Government 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 then was disordered and unreliable. This success in supply management led to the addition of essential commodities such as sugar, food grains and processed eatables into its distribution network. The irregularities in the distribution had to be corrected through organized supply and delivery system. The organization was not only able to meet the demand but was also able to maintain quality and later was able to provide iodized salt to prevent goiter a diseases that once plagued the Nepalese society.

Inventory management is one of the most important assets to most of the organization. There are large percentage of total capital is invested in inventory. The inventory is vital element in the efforts of the firms to achieve desires sales. A firm cannot achieve its goal unless inventories are controlled effectively and capital is allocated efficiently.

The major objectives of the study is to identify the inventory management practice in STC associated with inventory management problems and analyze them for their resolution in such a way that contribute to the profitability to STC. The specific objectives of the study are to examine the practice of inventory

management functions (i.e. procurement or acquisition of goods, storing of goods, issuing the goods from stores etc), to analyze the condition of inventory management and its relationship with other variables like net sales, net profit, purchase, total assets etc and to shows the effect of inventory in cash flow. Secondary data have been collected to meet the objectives. The statistical tools like mean, SD and CV are used to analyze the data. Similarly, the financial tools like financial ratio, inventory turnover ratio and inventory holding days have also been used.

5.2 Conclusions

On the basic of analysis of data and information collection from salt trading corporation, the following conclusions have been drawn.

- The main objectives of the study to analyze the condition of inventory managements its relationship with other variables like net sales, net profit, purchase and the affects of inventory in cash flow of STC. to fulfillment 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 ratio is below standard ratio. 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 rations are presented unfavorable and inefficient in inventory management. Both net sales and purchase are more uniform and consistency than that of inventory because of the CV of inventory is higher than net sales and purchase. The highest CV of net profit represents the lower uniformity and consistency.
- Trend of net sales, purchase and inventory are fluctuating in the same pattern while the CV of inventory is higher than the CV on net sales and purchase. But the CV of net profit is higher than inventory. And mean and

standard deviation of net 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. Increase in inventory cause decreases in cash inflow and vice versa.

5.3 Recommendations

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 the study they 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, purchase, store, 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 should apply scientific and effective inventory management system.
- The corporation should use EOQ model to determine order size, which minimize cost of organization and increase the profitability.
- The purchase and sales are done unsystematically. So, the corporation should follow the effective purchase and sales policy.
- After adjusting inventory to cash flow, it shows negative balance. So company should apply appropriate inventory policy to manage cash flow.
- The company should apply technique inventory management effectively and systematically.
- The company should manage its overall profitability.
- According to the vision, mission, objectives and strategies (VMOS), corporation should formulate strategic program and policies.
- The corporation should operate training activities and plan for successor.

BIBLIOGRAPHY

Books

- Adam, E. E, Ebrth, Jr.,& Ronal. J (2003). Production & Operation Management.
New Delhi: Prentice Hall of India Pvt. Ltd
- Agrawal Govinda Ram (2000) Marketing in Nepal, Kathmandu: Educational
Eneterprises Ltd.
- Chandra I.M. (1998) Financial Management, New Delhi, Vikash Publishing
House Pvt. Ltd.
- David P. (1964) *Inventory Management Explained: A focuses on forecasting, lot
sizing, safety stock and ordering system: Ops Publishing*
- Dobler, D.W., Lamar Lee, T.R.,& Burt, D. N. (1992). Purchasing & Material
Management. New Delhi: Prentice Hall of India Pvt. Ltd.
- Fremgen, K. Reily, (1973), *Investment*, The Dryden Press, CBS Publishing Japan
Ltd.
- Goet, J. Sharma, S., Bajracharya, P., & Ojha, P.K. (2006). Managerial Accounting
Kathmandu Asmita Books Publisher and Distributers.
- Gupta S.C and Sharma R. (1998). *Fundamentals of Statistics*, New Delhi:
Himalayan Publication House.
- Gupta, S.P (1992). *Management Accounting Budgeting, Business Budget &
Budgetary Control*, New Delhi: Agra Shahitya Bhawan.
- Hampton, J.J. (1992). Financial Decision Making, New Delhi Prentice hall of
India Pvt. Ltd.
- Jain, S. P. & Narang K.L. (1994) Advanced Accounting. New Delhi: Kalyani
Publishers
- Jain, M. and Narang, A. (1993). *Fundamentals of Investment*, St. Pant: West
Publishing Company, p. 13
- Lynch R.M & Williams R.W (1989). *Accounting for Management*, New Delhi:
Tata Mc Graw Hill Publishing Co.
- Magee, J.F. (1956). Inventory Policy. Harvard Business Review Solier Field Bost:
Reprint Department.
- Mishra, C.R. (1996). *Quantitative Technique*. New Delhi: Vikas Publishing House
Pvt. Ltd.

Pandey, I.M. (1994) Financial Management, New Delhi, Vikash Publishing House Pvt. Ltd.

Singh N. (2005) Production and Operation Management: New Delhi, MC Graw Hill Publishing Company Ltd.

Van Horn, J.C. (1985). Financial Management & Policy, New Delhi: Practice Hall of India Pvt. Ltd.

Previous Research Works

Bhusal B. (2007), Inventory Management : A comparative study of DDC and SGML, An unpublished Master's Degree Thesis, Kathmandu: Central Department of Management, T.U.

Dhakal D. (2006), A study on Inventory Management and Control of Royal Drug Ltd, An unpublished Master's Degree thesis, Kathmandu: Central Department of Management, T.U.

Gaire P. (2010), "Inventory Management of Bottlers Nepal Limited", an unpublished master level thesis submitted to Shanker Dev Campus, Faculty of Management, T.U.

Gnawali N. (2012), Inventory Management of National Biscuits & Confectionary Limited. An unpublished Master's Degree Thesis, Kathmandu: Central Department of Management T.U.

Maskey T. (2008), Inventory Management: A case study of Gorkhapatra Corporation, An unpublished Master's Degree Thesis, Kathmandu: Central Department of Management, T.U.

Pandey S.(2011), Inventory Management of Salt Trading Corporation. An unpublished Master's Degree Thesis, Kathmandu: Central Department of Management, T.U.

Upreti G. (2009), Inventory Management and its Impact on Working Capital Management of Unilever Nepal Limited. An unpublished Master's Degree Thesis, Kathmandu: Central Department of Management, T.U.

Annual Report

STC Annual Report, Kathmandu.

Appendix I

Computation of Cost of Goods Sold

Fiscal Year	Opening Inventory	Purchase	Closing Inventory	Cost Of Goods Sold (COGS)
2062/63	47.07	179.84	78.99	147.92
2063/64	78.99	127.97	87.66	119.3
2064/65	87.66	100.83	71.45	117.04
2065/66	71.45	131.72	61.16	142.01
2066/67	61.16	254.68	100.71	215.13
2067/68	100.71	246.36	144.75	202.32
2068/69	144.75	274.88	157.94	261.69

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

Appendix II

Computation of Average Inventory and Inventory Turnover Ratio

Fiscal Year	Opening Inventory	Closing Inventory	Cost Of Goods Sold (COGS)	Average Inventory	Inventory Turnover Ratio
2062/63	47.07	78.99	147.92	63.03	2.35
2063/64	78.99	87.66	119.3	83.33	1.43
2064/65	87.66	71.45	117.04	79.56	1.47
2065/66	71.45	61.16	142.01	66.31	2.14
2066/67	61.16	100.71	215.13	80.94	2.66
2067/68	100.71	144.75	202.32	122.73	1.65
2068/69	144.75	157.94	261.69	151.35	1.73

Note: Average Inventory = (Opening Inventory + Closing Inventory) / 2

Inventory Holding Ratio = COGS / Average Inventory

Appendix – III

Calculation of Inventory Holding Days

Fiscal Year	Average Inventory	Cost of Goods Sold (COGS)	Days in a Year	Inventory Holding day
2062/63	63.03	147.92	365	155.53
2063/64	83.33	119.3	365	255.00
2064/65	79.56	117.04	365	248.12
2065/66	66.31	142.01	365	170.43
2066/67	80.94	215.13	365	137.33
2067/68	122.73	202.32	365	221.41
2068/69	151.35	261.69	365	211.10
Total Holding days				1399

$$\text{Inventory Holding Day} = \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} \times \text{Day in a year}$$

$$\begin{aligned} \text{Mean of inventory Holding days} &= \frac{\text{Total Holding days}}{\text{Number of fiscal year}} \\ &= \frac{1399}{7} \\ &= 200 \text{ Days} \end{aligned}$$

Appendix IV

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

Fiscal Year	Net Sales (Y)	Inventory (X)	X ²	Y ²
2062/63	219.4	78.99	6239.42	48136.36
2063/64	185.06	87.66	7684.276	34247.2036
2064/65	191.62	71.45	5105.103	36718.2244
2065/66	213.9	61.16	3740.546	45753.21
2066/67	391.05	100.71	10142.5	152920.103
2067/68	336.64	144.75	20952.56	113326.49
2068/69	387.64	157.94	24945.04	150087
Total	∑Y=1925.08	∑X=702.66	∑X ² =78809.45	∑Y ² =581188.10

$$\text{Mean of Sales} = \frac{\sum Y}{n} = \frac{1925.08}{7} = 275.01$$

$$\begin{aligned} \text{S.D of Sales} &= \sqrt{\left\{ \frac{\sum Y^2}{n} - \left(\frac{\sum Y}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{581188.10}{7} - \left(\frac{1925.08}{7} \right)^2 \right\}} = 86 \end{aligned}$$

$$\begin{aligned} \text{Coefficient of Variation of Sales (C.V.)} &= \frac{\text{S.D of Sales}}{\text{Mean of Sales}} \times 100 \\ &= \frac{86}{275.01} \times 100 = 31.27\% \end{aligned}$$

$$\text{Mean of Inventory} = \frac{\sum X}{n} = \frac{702.66}{7} = 100.38$$

$$\begin{aligned} \text{S.D. of Inventory} &= \sqrt{\left\{ \frac{\sum X^2}{n} - \left(\frac{\sum X}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{78809.45}{7} - \left(\frac{702.66}{7} \right)^2 \right\}} = 34.40 \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation of Inventory (C.V.)} &= \frac{\text{S.D of Inventory}}{\text{Mean of Inventory}} \times 100 \\ &= \frac{34.4}{100.38} \times 100 \\ &= 34.26\% \end{aligned}$$

Appendix V

Calculation of Mean, Standard Deviation and Coefficient of Correlation of Purchase and Inventory

Fiscal Year	Purchase (Y)	Inventory (X)	X ²	Y ²
2062/63	179.84	78.99	6239.42	32342.4
2063/64	127.97	87.66	7684.276	16376.3
2064/65	100.83	71.45	5105.103	10166.7
2065/66	131.72	61.16	3740.546	17350.2
2066/67	254.68	100.71	10142.5	64861.9
2067/68	246.36	144.75	20952.56	60693.2
2068/69	274.88	157.94	24945.04	75559
Total	$\sum Y =$ 1316.88	$\sum X =$ 702.66	$\sum X^2 =$ 78809.45	$\sum Y^2 =$ 277350.00

$$\text{Mean of Purchase} = \frac{\Sigma Y}{n} = \frac{1316.88}{7} = 188.13$$

$$\begin{aligned} \text{S.D of Purchase} &= \sqrt{\left\{ \frac{\Sigma Y^2}{n} - \left(\frac{\Sigma Y}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{277350.00}{7} - \left(\frac{1316.88}{7} \right)^2 \right\}} = 65.04 \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation of Purchase (C.V)} &= \frac{\text{S.D of Purchase}}{\text{Mean of Purchase}} \times 100 \\ &= \frac{65.04}{188.13} \times 100 \\ &= 34.57\% \end{aligned}$$

$$\text{Mean of Inventory} = \frac{\Sigma X}{n} = \frac{702.66}{7} = 100.38$$

$$\begin{aligned} \text{S.D. of Inventory} &= \sqrt{\left\{ \frac{\Sigma X^2}{n} - \left(\frac{\Sigma X}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{78809.45}{7} - \left(\frac{702.66}{7} \right)^2 \right\}} = 34.40 \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation of Inventory (C.V.)} &= \frac{\text{S.D of Inventory}}{\text{Mean of Inventory}} \times 100 \\ &= \frac{34.4}{100.38} \times 100 \\ &= 34.26\% \end{aligned}$$

Appendix VI

Calculation of Mean, Standard Deviation and Coefficient of Correlation of Net Profit and Inventory

Fiscal Year	Net Profit(Y)	Inventory(X)	X ²	Y ²
2062/63	4.98	78.99	6239.42	24.8004
2063/64	2.91	87.66	7684.276	8.4681
2064/65	-10.37	71.45	5105.103	107.5369
2065/66	1.3	61.16	3740.546	1.69
2066/67	1.16	100.71	10142.5	1.3456
2067/68	3.72	144.75	20952.56	13.8384
2068/69	6	157.94	24945.04	36
Total	$\Sigma Y =$ 9.7	$\Sigma X =$ 702.66	$\Sigma X^2 =$ 78809.45	$\Sigma Y^2 =$ 193.68

$$\text{Mean of Net Profit} = \frac{\Sigma Y}{n} = \frac{9.7}{7} = 1.39$$

$$\text{S. D. of Net Profit} = \sqrt{\left\{ \frac{\Sigma Y^2}{n} - \left(\frac{\Sigma Y}{n} \right)^2 \right\}}$$

$$= \sqrt{\left\{ \frac{193.68}{7} - \left(\frac{9.7}{7} \right)^2 \right\}} = 5.074$$

$$\begin{aligned} \text{Coefficient of Variation of Net Profit (C.V.)} &= \frac{\text{S.D. of Net Profit}}{\text{Mean of Net Profit}} \times 100 \\ &= \frac{5.074}{1.39} \times 100 \\ &= 365.04\% \end{aligned}$$

$$\text{Mean of Inventory} = \frac{\sum X}{n} = \frac{702.66}{7} = 100.38$$

$$\begin{aligned} \text{S.D. of Inventory} &= \sqrt{\left\{ \frac{\sum X^2}{n} - \left(\frac{\sum X}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{78809.45}{7} - \left(\frac{702.66}{7} \right)^2 \right\}} = 34.40 \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation of Inventory (C.V.)} &= \frac{\text{S.D. of Inventory}}{\text{Mean of Inventory}} \times 100 \\ &= \frac{34.4}{100.38} \times 100 \\ &= 34.26\% \end{aligned}$$

Appendix VII

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

Fiscal Year	Purchase (Y)	Net Sales (X)	X ²	Y ²
2062/63	179.84	219.4	48136.36	32342.426
2063/64	127.97	185.06	34247.2	16376.321
2064/65	100.83	191.62	36718.22	10166.689
2065/66	131.72	213.9	45753.21	17350.158
2066/67	254.68	391.05	152920.1	64861.902
2067/68	246.36	336.64	113326.5	60693.25
2068/69	274.88	387.41	150086.5	75559.014
Total	ΣY= 1316.28	ΣX= 1925.08	ΣX ² = 581188.10	ΣY ² = 277350.00

$$\text{Mean of Sales} = \frac{\Sigma X}{n} = \frac{1925.08}{7} = 275.01$$

$$\begin{aligned} \text{S.D of Sales} &= \sqrt{\left\{ \frac{\Sigma X^2}{n} - \left(\frac{\Sigma X}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{581188.10}{7} - \left(\frac{1925.08}{7} \right)^2 \right\}} = 86 \end{aligned}$$

$$\text{Coefficient of Variation of Sales (C.V.)} = \frac{\text{S.D of Sales}}{\text{Mean of Sales}} \times 100$$

$$\begin{aligned} &= \frac{86}{275.01} \times 100 \\ &= 31.27\% \end{aligned}$$

$$\text{Mean of Purchase} = \frac{\Sigma Y}{n} = \frac{1316.88}{7} = 188.13$$

$$\begin{aligned} \text{S.D of Purchase} &= \sqrt{\left\{ \frac{\Sigma Y^2}{n} - \left(\frac{\Sigma Y}{n} \right)^2 \right\}} \\ &= \sqrt{\left\{ \frac{277350.00}{7} - \left(\frac{1316.88}{7} \right)^2 \right\}} = 65.04 \end{aligned}$$

$$\text{Coefficient of variation of Purchase (C.V.)} = \frac{\text{S. D of Purchase}}{\text{Mean of Purchase}} \times 100$$

$$\begin{aligned} &= \frac{65.04}{188.13} \times 100 \\ &= 34.57\% \end{aligned}$$