CHAPTER - I

INTRODUCTION

1.1 General Background

Nepal is the country with least development in industrial sector. So its economic status is very poor. Proper inventory management is very much important for making profit. Few private sector manufacturing enterprises has playing vital role in the Nepalese economy. After industrial act 2049, and by adopting privatization policy by Nepalese government, now a day's private industries operation is increasing day by day. So industrialization is an important factor to achieve basic objective of a country's economic and social progress.

Most of the business organization became failure due to not properly managing inventory for the production of any goods or services. If the company did not get the required materials at needed time then production, may be disturbed and fails to produce goods. Inventory is the stock material which frequently occurs in the organization. In this industrial age each and every organizations has their own inventory system. There are various techniques to the selection of inventory. More inventory required large amount of investment, not only that large amount of inventory whereas keeping minimum inventory will create the problem of shortage. Therefore inventory management plan required different types of inventory, required period and cost. Any stock that a firm keeps to make its future requirement for production and sales is called inventor. The basic reason for holding inventory is to keep up the production activities unhampered. Inventories are a part of current assets, which is used within one year, in the normal course of business operation manufacturing organization's activities generally buys and sells good. Therefore, combination of raw material, work in progress, finished goods and supplies is called inventory management. In other words, the planning coordinating and controlling activities related to the flow of inventory into through and out of an organization.

In general inventory can be defined as a stock of any land of items reserved in the store for a certain period. It constitutes the stocks of the project a company is manufacturing for sale and components that make up the product (Pandey I. M ,1991).

The modern concept of inventory management can be traced to 1915-1922 when some leading profounder like R.C. Davis, H.S. Own, E.F. dark and K.C. Wilson conceived independently developed an economic lot size equation which minimized the sum of carrying and ordering cost for particular material where the demand is known and constant (Buchan and Koenigsburg, 1977).

Inventory management is a topic of considerable and widespread interest. There are various scientific techniques to the solution of variety of inventory management. It should be effectively managed. The real task of top management lies in formulation of policies what will lead to optimal inventory investment for attainment of desired objectives.

1.1.1 Introduction of Bottlers Nepal Limited

Bottlers Nepal Limited is one of the manufacturing as well as multinational companies. Which manufactures, soft drinks that are Coke, Fanta, Lime, Sprite, Soda and drinking water under the brand name of Coca Cola. The company carries out the soft drinks under the registered trademark of the coca cola company managed by South Africa Bottling Company, South Africa.

It is established in 1987 under the company act 1964 with area of 10648 sq. m. of land and the building of the company covers 5823 sq. m. The company over roughly 90% of the Nepalese market when compared with the other brands of the similar products. This figure is inclusive of the subsidiary company's figure.

The company has authorized share capital of Rs. 5, 00,000 thousands and paid up value per share is Rs. 100/-. It has each issued capital of Rs 3, 70,000 thousands number of share holders in this company are 37. The paid up capital is R. 1, 94,889 thousands and value per share is Rs. 100/-.It is one of the top ten companies listed in the NEPSE in terms of the market capitalization.

In Nepal, there are two factories under Coca Cola Company. My study of BN Limited located at Balaju. There is also subsidiary known as BN (Terai) Ltd, at Chitwan district, Nepal. BN Company Limited distributes its product throughout the Bagmati Zone. Companies don't have policy of direct distribution channel i.e. through the dealer and retailer to the consumers. This company is using two types of plant for

production process. The old line has capacity of 220 bottles per minute and the recently installed is able to produce 430 bottles per minute. To maintain the leadership in the market of the company always concentrate for its raw materials from approved suppliers that are decided from head office. Raw materials like concentrate crown cock, sugar are imported from international and national market and $C0_2$ gas is produce in factory. The whole process i.e. raw material to finished goods is prepared by company secretly and sold without disclosures after introducing new package, the company has increased sales effort; Recently company is also looking for area of distribution but want to have more profit from the competition market. The company has its planning system but they don't forecast the sales. In last few years data we can see that sales has been increasing. The company has been able to increase the production efficiency of the plant fibbing better outputs as compared to the previous year. The company has increased new package of its products to counter the competition. In order to stay ahead of the competition the company has been lunching various types of promotional activities with financial and technical support from the coca cola company. The company is putting its full efforts into increasing the per capita consumption of its beverage in the market.

1.2 Statement of Problem

Nepalese industries are suffering from losses and ineffective management team. However they are not able to fully performing due to the inefficiency in resource utilization and ineffective inventory management system. Inventories are one of the resources within the physical resources. The present study will try to analyze and examine the practice in managing inventory resources of "Bottlers Nepal Limited" Effective management and control of inventory resources will help and reduce inventory cost, increase product quality and help in profitability of the organization.

The proposed problem of the research problems of the research are:

1. Is there scientific and systematic inventory how management system followed in Bottlers Nepal ltd?
2. To what extent a scientific analysis is done to minimize the inventory costs (i.e. carrying costs and ordering costs)

3. Which inventory policy is adopted by the company?
4. Is there EOQ model applied in purchasing?
5. What is the present practice of procurement and sales?

1.3 Objective of the Study

The general aim of the study is to find to the inventor management system exercised by the company. The specific objectives are, as follows.

I. To assess and evaluate the inventory system used in "Bottlers Nepal Ltd".
II. To analyze present inventory position of Bottlers Nepal Ltd.
III. To examine the techniques of inventory management of this company.
IV. To compare the investment in inventory for the different year.

1.4 Limitation of the Study

This study has certain limitations which are given below:

1. The data have been based on five fiscal years performance of the company.
2. The study is limited to the area of inventory management of Bottlers Nepal only.
3. This is based on secondary as well as primary data.
4. The conclusion derived from the study doesn't ensure wider applicability in all types of manufacturing companies.

1.5 Significance of the Study

Inventory is one of the important aspects to produce the product continuously. It helps to provide the goods and services as per customers demand. So it plays vital role for the customer's satisfaction, which is the focus of every business house. For the achievement of the firm's goal proper management of inventory is needed. Proper inventory management helps to maximize the profitability do not block the inventories. A company should maintain adequate raw materials or finished goods. If slightly changes in the cost of materials it will effect in the profitability so the company should keep an adequate inventory stock of inventory by keeping adequate inventory the company able to supply whatever the demanded.

It provides the scientific and systematic inventory management system. It helps to the further researcher to know about the inventories system applied by BNL. This research may be the base for them.

1.6 Organization of the Study

The overall study has been divided into five chapters.

Introduction

The very beginning chapter is consists of the introduction of the study, statement of the problems objectives of the study, needs of the study and organization of the study.

Review of literature

The second chapter is review of literature consists of review of differentiation dissertations including findings and recommendation and the conceptual frame work.

Research Methodology

The third chapter is research methodology consisting of research design nature and scope of data, Population of sapling size and data collection procedure and data analytical tools. The following strategies have been adopted to fulfill the above mentioned objectives.

Presentation and Analysis of Data

The fourth chapter is presentation and analysis of data based on facts and figures gathered by different methods i.e. EOD, targeted and actual production, targeted and annual sales and major findings.

Summary, Conclusion and Recommendation

The fifth chapter is the last chapter which includes summaries, conclusion and Recommendation.

Bibliography and necessary appendixes have also included at the end.

CHAPTER - II

REVIEW OF LITERATURE

Scientific research must be based on past knowledge. The previous studies cannot be ignored because they provide the information of the present study. Literature review is basically "Stock Taking" of available literature in ones field of research.

The great depression of 1930's and before 2nd world war, the American economy as well as world economy were plagued by capital utilization, material storage, high interest rates and inflation. That situation made the managers of the organizations play attention in inventory was very much but needed

Considerations would not be managed the inventory so far. The previous concepts and techniques have been development in this regard.

Meaning of inventory is a challenging for any business enterprise. In general, inventory can be defined as stock of any kind of items. Reserved in the store inventory management involves the planning of the optimal level of the inventory cost supported by an appropriate organization structure, which is staffed by trained person and directed by top management. It involves both financial dimensions as well as physical dimensions and these dimensions are interrelated and can't be locked isolation. Although various scientific techniques to the solution of inventory management has been facing the problem of effective handling of inventory. There have been other researches on the inventory management in Nepalese enterprises too.

"The purpose of reviewing the literature is to develop some expertise in ones area, to see what new contribution can be made and to receive some ideas for developing a research design" (Wolff and Pant, 1999).

In this chapter attempts have been made to present the review of literature regarding inventory management and control. This chapter is divided into two subsections, conceptual framework (theoretical concept of inventory management) is presented in first section and Review of literature related studies has been presented in the second section.

2.1 Conceptual Framework

It is a part of review of literature. In this framework of decision about theoretical review from text books, reference books and practice in Inventory management and its theories are considered.

2.1.1 Inventory Management

Inventory is store of goods and stocks. Inventories play vital role on the success of the organization. Modem concept of inventory management can be traced to 1915-1922 with several authors (R.C. Davis, H.S. Owen, E.F. dark and R. H. Willson) acting independently development an economic lot size equation which minimize sum of carrying cost and holding costs for where the demand was known and constant.

Most of the business organization became failure due to not properly managing inventory for the production of any goods or services. Many types of direct or indirect materials are required. If the company did not get the required materials at needed time then production, system may be disturbed and fails to produce and sale of the products. Inventory is the stock materials or product which frequently occurs in an organization. In this industrial age each and every organizations has their own inventory system. There are various techniques to the selection of inventory management. Keeping more inventory required large amount of investment in inventory. On the other hand keeping less inventory required less amount of investment but that will possible to create problem of shortage . Therefore inventory management plan to required amount of different types of inventory, required period and cost. Any stock that a firm keeps to make its future requirement for production and sales is called inventory. The basic reason for holding inventory is to keep up the production activities unhampered. Inventories are a part of current assets, which is used within one year, in the normal course of business operation manufacturing organization's activities generally buys and sells good. Therefore, combination of raw material Work in progress, finished goods and supplies is called inventory management. In other words, the planning coordinating and controlling activities related to the flow of inventory into through and out of an organization.

In general inventory can be defined as a stock of any kind of items reserved in the store for a certain period. It constitutes the stocks of the project a company is manufacturing for sale and components that make up the product (Pandey I. M 1991).

In case of trading concern inventory will comprise only finished goods and stock in trade owned by if for sale to customers in the normal cause of business (Jain and Narang, 1993,p-142).

Inventory management involves planning of optimal level of the material and cost 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 dimension are interrelated and can't be looked in isolation. Inventory form a link between production and sale of product. The optimum level of inventories should be judged in relation to the flexibility of inventories. The lower the level of inventories makes the high flexibility of the firm. And higher level of inventories makes less flexibility. Inventory in the forms of raw material, work- in-progress and semi finished goods are great significance for the success of an enterprises. These can directly affect the efficiency of the system. It is observed that irrespective of the size of an enterprise.

The expenditure of materials is a major item of the budget in many cases materials consumption varies from 25% to 75% of sales turnover. The expenditure made on materials is money invested in inventories, cost of storage, transportation cost, insurance, wastage etc. Because of the magnitude of expenditures required acquiring on controlling inventory and their impacts on profit. A great deal of attention is required forwards the management of operation associated with materials. (Goel, 2nd Edition, p- 270)

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 is necessary it is because the aim of inventory maintains optimum level of inventory for the smooth production and sales operation. Therefore inventory case of maintain desired level of inventor and minimizing total cost of inventory

investment for the plan and policies that will lead to optimal inventory investment for attainment of desired objective.

The growing number of manufacturing and non-manufacturing enterprises in Nepal is facing problem of inventory- management. Due to lack of proper inventory polices, there are many enterprises where large amount of capital has been blocked up and very little measures have been taken to manage the inventory decisions. Models and techniques that have so far developed (Shrestha, 1980, p-142). The area of inventory management and controls covers the following individual phases determining the size of inventory tale carried establishing time schedules. Procedure and a lot of sizes for new order, determining minimum safety levels and co-ordination of sale production and 'inventory policies for providing proper storage, facilities, arranging the receipt, disbursement and procurement of materials, developing the forms of recording these transaction, assigning responsibilities for carrying out the inventory control function and providing the reports necessary for supervising these overall activity (Kuchal, 1979, p-227).

Inventory management and control also deserves special attention as over investment in inventories results shortage of cash for other purpose like payment of maturing liabilities carrying of account receivable and expansion of fixed assets similarly the consequences of investment inventories are loss of regular customer. They don't find selection of varieties and burden of unnecessary cost of operation due to shortage of raw material. Therefore inventory management and control involves the inventory decision models and determine the optimum investment.

2.1.1.1 Nature of Inventories

Inventories are stock of the product, a company is manufacturing for sale and components that make up the product. The carious forms in which inventories exists in a manufacturing a company are raw materials, work in process and finished goods.

(1) Raw materials are those basic inputs that are converted into finished product through the manufacturing process. Raw materials inventories are those units which have been purchased and stored for future production.

(2) Work in progress of inventories are semi manufactures products. They represent products that need more work before they become finished product for sale.

(3) Finished goods inventories are those completely manufactured products, which are ready for sale. Stock of raw materials and work in progress facilitate for production, while stock of finished goods is required for Smooth marketing operations. Thus, inventories serve as a link between production and consumption of goods.

The levels of three kinds of inventories for a firm depend on the nature of its business. A manufacturing firm will have substantially high levels of all three kinds of. Inventories while a retail or whole sale firm wall have very high levels of finished goods inventories and no raw material and work in progress inventories. Within the manufacturing firm there will be difference. Large heavy engineering companies produce long production cycle. Products, therefore, they carry large inventories. On the other hand, inventories of customers Product Company will not be large because of short production cycle and fast turnover.

A fourth kind of inventories are also maintained by firms. Supplies include office and plant cleaning materials (soap, brooms etc.), oil fuel, light bulbs and the like. These materials do not directly enter production, but are necessary for production process. Usually, these supplies are small part of the total inventory and do not involve significant investment. Therefore, a sophisticated system of inventory control may not be maintained for them.

2.1.1.2 Objectives of Inventory Management

In the context of inventory management, the firm is forced with the problem of meeting two conflicting needs:

1. To maintain a large size of inventory for efficient and smooth production and sales operation.

2. To maintain a minimum investment in inventories to maximize profitability.

Both excessive and inadequate inventories are not desirable. These are two danger points within which the firm should operate. The objective of inventory

management should be to determine and maintain optimum level of inventory investment. The optimum level of inventory will lie between two danger points **of** excessive and inadequate inventories.

The firm should always avoid a situation of over investment in inventories. The major danger of over investments are (a) Unnecessary tie up of the firms fund and loss of profit (b) Excessive carrying cost and (c) Risk of liquidity. The excessive level of inventories consumes fund of the firm, which cannot be used for any other purpose, and thus, it involves an opportunity cost. The carrying cost, such as the costs of storage, handling, insurance, recording and inspection, also increase in proportion to the volume of inventory. These costs will impair the firm's profitability further. Excessive inventories carried for a long period increase chance of loss of liquidity. It may not be possible to sell inventories in time and at full value. Raw materials are generally difficult to sell as the holding period increases. There are exceptional circumstances where it may pay to the company to hold stocks of materials. This is possible under conditions of inflation and scarcity. Work in progress is far more difficult to sale; similarly difficulties may be forced to dispose to finished goods inventories as time lengthens. The down and shift in market and the seasonal factors may cause finished goods to be sold at low prices. Another danger of carrying excessive inventories are the physical determination of inventories while determination occurs with the passage of time, or it may be cause to mishandling and improper storage facilities. These factors are within the control of management; unnecessary investment in inventories can thus, be cut down.

Maintaining an inadequate level of inventories is also dangerous. The consequences of underinvestment in inventories are (a) production hold ups and (b) failure to meet delivery commitments. Inadequate raw materials and work in progress inventories will result in frequent production interruptions. Similarly, if finished goods inventories not sufficient to meet the demand of customer regularity, customers may shift to compete, which will amount to permanent loss to the firm.

The aim of inventory management, thus, should be to avoid excessive and inadequate levels of inventories and to maintain sufficient inventory for the smooth production and sales operations .With the right source to acquire the right quantity at the right price and quantity. An effective inventory management should;

a. ensure a continuous supply of raw materials to facilitate uninterrupted production,
b. maintain sufficient stocks of raw materials in periods of short supply and anticipate price changes,
c. maintain sufficient finished goods inventory for smooth sales operation and efficient customer service,
d. minimize the carrying costs and time and
e. control investment in inventories and keep it at an optimum level.

2.1.2 Major Functions of Inventory Management

2.1.2.1 Purchasing

Purchase management is one of the major functions of inventory management. No business can run without purchasing either raw materials or parts of office supplies or semi finished products or finished products or all of them. Purchasing require a substantial part of a firms finance which effects the cash flow position of the company. So purchase management tries to purchase the required things at the right time on reasonable prices from right vendors and ensures the adequate quantity of the goods being purchased and the economy of purchase.

Purchase management aims to make continuous availability of materials/ merchandise so that there may be uninterrupted flow of materials/merchandise for production/ supply of merchandise of sales, to make purchase competitive and wise at the most reasonable prices, to make purchase in reasonable quantities of materials to have minimum possible wastage of materials and loss in production/less quantity determination until the merchandise is sold and to develop good supplier relationship which will ensure the best terms of supply of materials

(A) Objectives of purchasing

1. Procurement of required quantity of materials at the best price not necessary the lowest price.
2. Procurement of materials, which best suit the product and the purpose for which they are intended.

3. Purchasing for time utility by a schedule, sufficient in advance of the demands of the production department so that the production work shall not suffer due to lack of materials.
4. Buying the quantity, which is neither too much that involves belonging of capital, nor too little that holds up the regular supply for production.
5. Improvement of the product with reference to quality and the disruption by means of selection of adequate materials.
6. Maintaining continuous supply to ensure production schedule at a minimum investment.
7. Maintenance of company competitive position i.e. the market by having companies quality standards in accordance with the demands of the customers.
8. Creation of goodwill for the company through dealing with supplies.

Developing fullest co-operation and maintenance of internal relationship among various department of the company.

(B) Centralized vs. Decentralized Purchasing

If all the purchases of a concern are made centrally the head office or only one department such type of purchasing is known as centralized purchasing. Materials and goods thus purchased are transferred to the sections, departments and branches located at different places as per the requirement.

If the purchases of a concern is decentralized to departments or branches at different place, such type of purchasing is known as decentralized purchasing. A manufacturing concern which operates several branches or factories at different places and manufactures different products requiring different types of materials/goods can meet their requirements by making purchases in their local markets.

(C) Purchasing Procedure

Purchasing is the base of a concerns operation, whether it is a manufacturing or non manufacturing. No concern can run without purchasing. Purchasing needs huge amount of costs and substantial time and efforts. If purchasing is effective it influences organizational effectiveness and profitability. The main steps in purchasing procedure may be listed as follows:

• Receiving Purchasing Requisition

The initiation of purchase begins with formal requisition request from the various sections or departments to the purchase department to order goods. The request is made in purchase requisition slip to the purchase departments by the department needing the initiation of purchasing begins with the formal request from goods authorizing the purchase department for purchasing the goods as per the slip by the date mention it.

- **Decision to Purchase**

When the purchase requisitions have been collected purchase Department complies and integrate the requirement of materials/goods and submits to the authorized executive for approval to purchase.

- **Finding the Sources and choosing the Supplier/Vendor**

Having the decision for the purchase of materials, the pursing agent should study the market condition on the basis of market reports as to when and what goods should be purchased. An intensive study should be made in regard to the source of supply from where the goods can be purchased with the help of catalogues, directories, old record, price lists of vendor and purchase records etc.

- **Preparation and Issuance of Purchase Order**

When the supplier is selected, purchase department/unit prepares a purchase order for supply of stores. It is the within authorization to the supplier to supply materials. It is the evidential document by which the Supplier is bound to supply materials as per the terms and conditions of purchase order and the purchaser is required to accept delivery of and make payment for materials as agreed up on. Generally 3 to 5 copies of purchase order are prepared depending up on the size of the organization. Regular follow up of purchase order should be done to endure smooth purchase of materials and safe guard against the shutdown of factory/office due to non receipt of materials/goods.

- **Receiving and Inspecting Materials**

The responsibility of receiving and inspecting is given to a separate Receipt & Inspection Department independent of stocking locations in large concerns. It may be

entrusted to the storekeeper. Receiving & inspection functions includes maintenance of purchase order files, receiving, unloading and unpacking the materials/goods received by comparing purchase order with consignment papers and notifying any shortage or breakage to the supplier, checking the quality of materials/goods received by specialized personnel to ensure the quality is as per purchase order then submitting inspection report and Goods Received Notes to the quality and quantity and if some materials are rejected the reasons there of. On the basis of Goods Received Note, purchases are verified and payment is made to the supplier and it may serve as a proof in filling any claim for short supplier.

- **Checking and Passing of Bills for Payment**

On receipt of invoice from the supplier, it is sent to the stores accounting section to examine both authenticity as well as arithmetic accuracy, invoice quantity price and their arithmetical accuracy is verified and checked on the basis of goods received notes and the purchase order. After the invoice is thus verified in all respects, the stores accounting section certifies and passes the invoice for payment and on this basis, the account section/ cashier can make the payment.

2.1.2.2 Store Keeping

Store keeping is an aspect of inventory control that is concern with the physical storage of goods. Store keeping function receives materials, products them from misappropriation, damage, deterioration, evaporation and carelessness. Since the investment in materials/goods constitutes major portion of current assets, there should be separate stores unit is required for store keeping functions. Whether it is stores department or a stores unit, it should be efficient and well equipped.

A) Objectives of store keeping

The major objectives of store keeping can be outlined as follows:

1. Receiving, handling and issuing goods economically and efficiently,
2. Using the available storage space and labor efficiently
3. Protection of all goods against all cases like fire, theft, obsolescence etc.
4. Maintaining regular supply of raw materials at all times when properly authorized,

5. Facilitating ordering of required materials/goods,
6. Minimizing the inventory handling cost.

(B) Types of stores

There may be three types of stores:

(I) Centralized Stores

If the materials/goods are received by and issued from one stores department, such is known as centralized stores. All materials/goods are kept at one central store. In most of the concern, the usual practice is to have a central store. By practicing such stores, stocks levels and investment in stocks can be minimized. As a result less storage space is enough. Better layout of stores becomes possible. It is easier to make inventory checks and better transportation costs since one central. But it may Increases transportation costs since one central store may not be closer to every department of the concern. It may be delay and inconveniences to pass materials/goods to other departments. Risk of all eggs in one basket also prevails and break down in transport may stop production in departments.

(II) Decentralized Stores

In a concern, if there are independent stores at each department, such type of stores is known as decentralized stores. The departments can draw the required materials/goods from the stores situated in their own department. The disadvantages of centralized stores can be avoided by such stores but it is costly.

(Ill) Central Stores with Sub-stores

Some organizations practice central stores with sub stores are operated as impress system of petty cash. At the beginning of a determined period, a particular quantity of materials/goods is transferred to sub-system from central stores and at the end of the period, sub-stores will requisition from the central stores the quantity consumed of materials/goods to bring the stock up to the predetermined quantity. Hence it can be concluded that large concerns, use central stores with sub- stores as a trade off to overcome the disadvantages of centralized and decentralized stores.

(C) Location and Layout of Stores department

Location and layout of stores department plays very important role in achieving the store keeping objectives. The location of the stores department should be carefully planned out and it should be housed in a position which is very close to Receiving Department so that transportation charges are at a minimum. There should be easy access to all other departments of the factory, records etc. So minimum of expense is incurred in unloading. Bulky and heavy stores should be located nearest to 'the department requiring them which minimizes the labor and transportation charges and avoids delay which these are needed. The layout of the stores department should be carefully considered to manage the space. The store should be divided into racks which should be further sub-dividend into small spaces. Such are known as Bins and one bin is allotted for one item of material. Bin is not necessary a space on a rack but it really means any place where materials/goods needed in a department should be kept side by side. The stores building should be so constructed that will avoid loss due to damage and pilferage.

(D) Classification & Codification

It is essential to scientifically classify and codify the various items of stores for a good system of store keeping. Materials/goods may be classified either on the basis of their nature or on the basis of their usage. Classification of nature is most commonly used. After assigning all items of stores into various classifications, each item of stores should be codified alphabetically by giving it a distinctive stores code number. Decimal system of codification is more commonly used. Under this method, the whole numbers are used to main group and the decimals to indicate the main group and the decimals to indicate primary, secondary and other groups. Classification of various items of stores resulting into prompt issues of stores.

1 Bin Card

Bin card is a space of materials/goods in the stores. For each bin a card is maintained to record receipt, issue and balance of each item of materials/goods. For each item of stores, minimum quantity, maximum quantity and ordering quantity are stated on the card. Bin card helps the storekeeper to control the stock and sent the requisition for the purpose of materials/goods in time.

2 Store Ledger

This ledger is kept in the costing department and is identical with the bin card except that receipts, issues and balanced are shown with their moneys time of stores and makes record of the receipts, issues and the balances both in quantity and value. Thus this ledger provides the information for the pricing of materials issues and the money value at a time of each item of the stores. (Jain & Narang.1991)

Sample of store ledger

Name of Article Maximum Quantity

Code No. Minimum Quantity

Bin No Ordered Quantity

Date	Receipts				Issues				Balance			Remarks
	S.No.	Qty.	Rate	Amt.	S.No.	Qty.	Rate	Amt.	Qty.	Rate	Amt.	

2.1.2.3 Issuing

Materials/products in stock/store should be issued only against requisition slip signed by authorized person and the quantities issued and the balance should be correctly recorded in the Bin Cards, stores ledger and job ledger. The requisitions received are serially numbered by the store keeper so that no requisition may be left out in accounting. It is very critical to request for requisition from the purchasing department when the stock of a material/product reaches the re-order level. Price of the issue can be determined on the basis of cost price or market price or other inventory valuation methods depending upon the forms policy.

2.1.2.4 Inventory Valuation

Conceptually the process of valuation the inventory is simple. We can calculate inventory value that multiplying physical quantity of goods by cost per unit.

But it practice many organizations purchase different types of raw materials at different price and different time.

It is not possible to identify the individual particular purchase group. At that solution firms have faced difficulties in valuation the inventories. There are various methods of purchasing material and issues of materials. Some of them are as follows;

• Simple Average (SA) Method

In simple average method, issue is priced at the price by averaging only the price of materials of each lot with the number of prices. This method is rarely used since it does not include quantities while pricing materials issues. As a result, this method does not recover the cost price of the materials from the production.

• Weighted Average Cost (WAC) method

It assumes that goods are removed from the beginning inventory and purchases group in proportion to the number of units, in these groups consequently; cost of the ending inventor}' also represents a proportional distribution from the beginning inventory and various purchase groups. "The weighted average cost computed by dividing the total cost of goods available for during period." (Loughm, 1990:221)

• First in First out (FIFO) Method

Under this method the firm disposes oldest materials first and closing inventory consists the most recently purchased items. The inventory is valued at the unit cost of materials recently purchased. The FIFO method is applicable to the corporation dealing in such commodities having not fluctuation in price. (Manohar Krishna Shrestha 1980,)

• Last-In First-out (LIFO) Method

The LIFO method of pricing is based on the assumption that the last units received are the first to be issued. Materials issued from stock are charged out at the cost of the latest shipment received until that lot is exhausted. The next issues are then made from the next order preceding, provided the materials in that order where not

previously issued. This method is desired to change goods manufactured with the prevailing costs materials instead of with cost which may have been paid for materials at a much earlier date.

• Market Price Method

Issues are priced at market price i.e. replacement price or reasonable price. The replacement price issues in case of the item which are kept in stock for use in production where as realizable price is used in case of the items fort sale. This method is considered to be the best method where quotations have to be sent because quotation sent reflect the least competitive conditions so far as materials are concerned. It depicts the higher efficiency of purchase management. If the market price is higher then the cost price, purchase management is efficient and if lower, vice versa.

2.1.3 Classification of Cost

The costs are generally classified in following types

2.1.3.1 Acquisition Cost or Ordering Cost

This cost is related with raw materials and the entire cost of acquiring raw materials. It involves requisitioning ordering, transporting, inspecting and cost incurred till the inventories reached to the store and course both fixed and variable elements.

Ordering cost vary with the no of orders. High no of order increase the ordering cost and low no of order reduce the ordering cost. It is calculated with the help of Annual Requirement, ordering cost per order and Quantity order size. Assuming the ordering cost '0' is fixed per order; the total cost is calculated simply by multiplying '0' by the no of items to be ordering number of order of order size. This cost is calculated as;

$$\text{Ordering Cost} = \frac{Annual\ Requirement}{Quantity\ order\ size} \times Ording\ cost\ \ perorder$$

$$= \frac{A}{Q} \times O$$

2.1.3.2 Holding cost or Carrying Cost

It is one of the major costs in inventory management. It consists of the following expenses

- Interest of capital tie up inventory (opportunity cost)
- Insurance and tax
- Maintenance and deterioration
- Holding cost
- Clearing and
- Warehousing costs

Carrying cost varies with the inventory size. High inventory size means high carrying cost and low inventory size means low inventory size means low carrying cost. It is computed as

Carrying Cost = Average Inventory × Carrying cost per unit

$$= \frac{Q}{2} \times C$$

2.1.3.3 Over stock and Stock out Cost

Over Stock: It is mainly related to sakes and production. Production is high and sales is less or demand from market is terminated but goods are still remained 'unsold it is termed an overstock cost.

Stock out cost: If the goods go out of stock, before the demand for the product is determined the stock to raw materials go out of stock, before the production process is completed is called out of stock. Alternatively if the goods are not available at the time of production process, it loose the possible profit as well as goodwill from customers is the termed as stock out cost, production process can be caused with the insufficient supply raw materials.

Evertte E. Adam, J.R. Ronald and Evert said that inventory costs or cost associated with inventory included following five types of relevant costs. Costs of the items or value of the item paid to the supplier or purchase price.

- Cost to procure the item.

- Carrying cost of item.
- Cost associated with being out of stock when units are demanded but unavailable (stock out).
- Cost associated with data gathering and control procedure for the inventory system. Stock out cost is computed as follows

Stock out cost = Inventory cycle per year × Stock out units × Probability of possible stock out × Per unit stock out cost (Westion and Brigham 1981).

2.1.4 Aspect of Inventory Management

There are various types aspects if inventory management. Keeping the various inventory cost in mind, the process of inventory management consists the following by aspects;

• Purchasing

• Receipt and store keeping and

• Issue and its pricing

2.1.5 Need to Hold Inventories

The question of managing inventories arises only when the company holds inventories. Maintaining inventories involves tying up of the company's fund and incurrence of storage and handling costs. If it is expensive to maintain inventories, why do companies hold inventory? There are three general motives for holding inventories (Starr, Martin, K, and David W. Miller, Englewood Ckiffs, 1962).

- Transaction motive emphasizes the need to maintain inventories to facilitate smooth production and sales operations.
- Per continuity motive necessitates holding of inventories to guard against the strike if unpredictable changes in demand and supply forces and other factors.
- Speculative motive influences the decision to increase or reduce inventory level to take advantage of price fluctuation.

A company should maintain adequate stock of materials for a continuous supply to the factory for an uninterrupted production. It is not possible for a company

top procure raw material when ever it is needed. A time lag exists between demand for materials and its supply. Also there exists uncertainty in procuring raw material in time on many occasions. The procurement of materials may be delayed because of such factory as strike, transport disruption or short supply. Therefore the firm should maintain sufficient stock of raw materials at a given time to streamline production. Other factor which may necessitate purchasing and holding of raw materials inventories are quantitative discounts and anticipated price increase. The firm may purchase large quantity of raw materials than needed for desired production and sales levels to obtain quantity discounts of bulk purchasing. At times, the firm would like to accumulate raw materials raw materials in anticipation of price rise.

Work in process inventor builds up because of the production cycle. Production cycle is the time span between introduction of raw materials into productions and emergence of finished product at the completion of production cycle. Till production cycle completes, stock of work in process has to be maintained. Efficient firms constantly try to make production cycle smaller by improving their production techniques.

Stock of finished goods has to be held because production and sales are not instantaneous. A firm can not produce immediately when goods are demanded by customers. There fore, to supply finished goods on a regular basis, their stock to be maintained for sudden demands from customers. In case the firm's sales are seasonal in nature, substantial finished goods inventories should be kept to meet the peak demand. Failure to supply product to customers, *when* demanded, would mean loss of the firm's sales to competitors. The levels of finished goods inventories would depend upon the coordination between sales and production as well as on production time. If there is close link between sales and production, a small finished goods inventory could be maintained and still customer's need could be met.

2.2 Technical Framework

In managing inventories, the firm's objective should be in consonance with the shareholders wealth maximization principle. To achieve this, the firm should determine the optimum level of inventory. Efficiently controlled inventories make the firms flexible. Inefficient inventory control results in unbalanced inventory and

inflexibility. The firm may sometimes run out of stock and sometimes may pile up unnecessary socks. This increases the level of investment and makes the firm unprofitable.

To manage inventories efficiency, answers should be sought to the following two questions;

• How much should be ordered?

• When should it be ordered?

The firms question, how much to order, relates to the problem of determining economic order quantity(EOQ), and it answered with an analysis of costs of maintaining certain level of inventories. The second questions, when to order, arises because of uncertainty and is a problem o determining the re order point (Pandey I. M., 1999).

Under it, it includes such questions which reduce in cost and increase in profitability. The problem which is common to all is *how* to establish and execute inventory policies. How much they should buy at a time? How low should they let inventory to full before they replenish it? From whom they should buy and how should they ensure getting the lowest price available. So the main complex problem has a large number to stock keeping items but it is not possible to answer all these questions, moreover development in management science and quantitative approach to business decision. It has been possible to answer these varied question or problem faced by the business unit (Adam, Everett, 1993).

2.2.1 Inventory Models

To manage inventory system efficiently a manufacturing firm should apply scientific tools and techniques of inventory management. System approaches consider in a single model all the factors that affect the inventory. A system for effective management involves three inventories model i.e. Economic Order Quantity (EOQ), Re Order Point (ROP) and Stock Level.

2.2.1.1 EOQ Model

The economic order quantity is an important concept in the purchase of raw materials and in the storage of finished goods in transit inventories. In our analysis, we wise to determine the optimal order quantity of a particular item of inventory, given its forecasted usage, ordering cost and carrying cost. Ordering cost can mean either the purchase of the item or its production. (James C. Van Home, 1991)

One of the major inventory management problems to be resolved is how much inventory should be added when inventory is replenished. If the firm is buying raw material it has to decide lots in which it has to be purchased on each replacement. If the firm planning a production run, the issue is how much production to schedule or how much to make? These problems are called order quantity problems and the task of the firm is to determine the optimum or economic order quantity or economic lot size. Determining an optimum inventory level involves two types of costs: (a) ordering costs (b) carrying costs. The economic order quantity is that inventory level much minimizes the total of ordering and carrying cost (Pandey I, M, 1999).

EOQ attempts to keep the most economic balance between the purchasing cost and carrying cost by determining quantities to be ordered. The most economic quantity is ascertained at this point, which is calculated by formula method.

Assumptions

Annual Requirement (A) =500 kg.

Carrying cost per unit (C) = Rs. 5

Ordering cost per order (0) = Rs. 20

$$\text{EOQ} = \frac{\sqrt{2\text{AO}}}{\text{C}} = \frac{\sqrt{2 \times 5000 \times 20}}{5} = 200\text{Kg.}$$

EOQ can be determined by three approaches:

1. formula approach:
2. trial and Error Approach
3. Graphic Approach

1.Formula Approach

$$\text{Total Cost} = \frac{Q}{2} \times C + \frac{A}{Q} \times 0$$

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

$$\text{No. of Order} = \frac{\text{Annual demand}}{EOQ}$$

(James C. Van Horne , 1991)

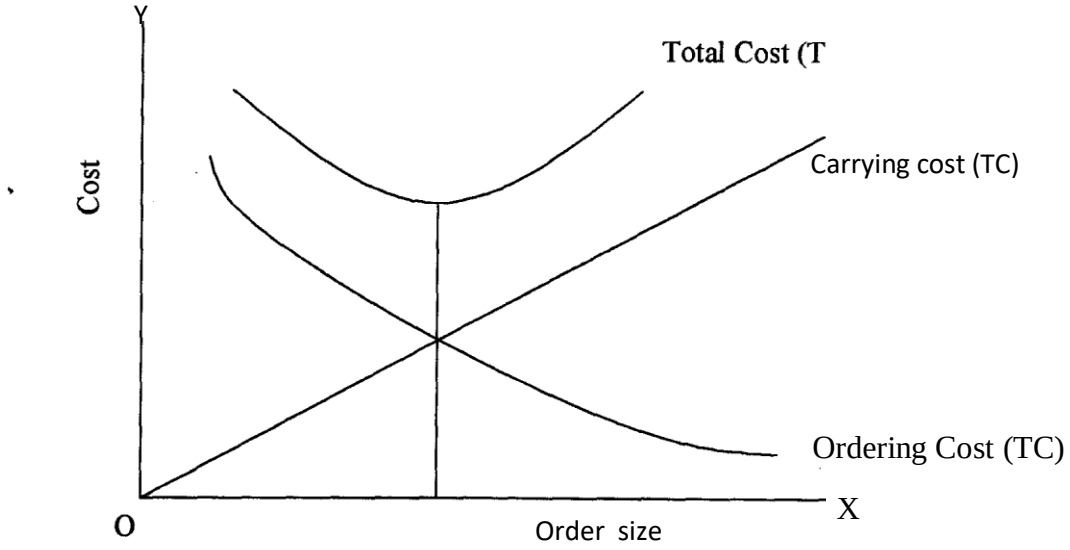
2. Trial and Error Approach

Table 2.1

1	No. of order	1	2	5	10	20	25
2	Order size	5000	2500	1000	500	250	200
3	Avg. Inventory	2500	1250	500	250	125	100
4	Carrying Cost @ Rs.5	12500	6250	25000	1250	625	500
5	ordering cost @ Rs.20	20	40	100	200	400	500
Total		**12520**	**6290**	**2600**	**1450**	**1025**	**1000**

3. Graphic Approach

Figure 2.1



(James c. Van Home, 1991)

2.2.1.2 Re Order point

An important question in any inventory management system is "When an order be placed so that the firm does not run out of goods?" The answer, expressed in term of units of inventory, is provided by the reorder point system.

The reorder point is the level of inventory at which the firm places an order in the amount of the economic order quantity. If the firm places the order when the inventory reaches the order point, the new goods will arrive before the firm runs out of goods to sell (John J. Hamption, 1998).

The problem how much to order, is solved by determining the economic order quantity, yet the answer should be sought to the second problem, when to order. This is a problem of determining the re order point. The re order point is that inventory level at which an order should be placed to replenish the inventory. To determine the reorder point under certainty, we should know, (a) Lead time, (b) Average usage and (c) Economic order quantity. Lead time is the time normally taken in replenishing inventory after the order has been placed. By certainty we mean that usage and lead time do not fluctuate. Under such a situation, re order point is simply that inventory level which will be maintained for consumption during the lead time.

That is;

Re order point = Lead Time × Average Usage

(Pandey I. M.,1996)

Three items are needed to design the re order point sub system they are given below:

(a) **Usage Rate**: This is per day, per week etc rate at which the items are consumed in production.
(b) **Lead Time:** It is the time normally taken in replenishing inventory after the order been placed.
(c) **Safety Stock Level**: This is the minimum or buffer inventory as cushion against expected increased usage and/or delay in delivery time.

Safety stock is necessary for an uncertain demand of the customers. The demand for goods may fluctuate day by day or from week to week. If the actual usage or sales increases then delivery of goods is delayed. The provision of safety stock makes the organization able to face the problem of stock out.

According to Levis J. Rage safety quantity which the plan must keep to make sure that the time never runs out of materials which could help up the movement of the production line as a whole.

Here,

Re order point = (Lead Time× Average Usage) + Safety stock (With safety stock)

Re order point = (Lead Time ×Average Usage) (Without safety stock)

2.2.1.3 Stock Level

This stock level subsystem keeps track of the goods hold by the firm the issuance of the goods and arrival of orders. It is made up of the records accountings for the goods in stock. Thus the stock level sub system maintains record of the current level of inventory.

(a) Maximum stock level

It refers to the maximum quantity of an item of material, which can be held, in stock at any time. Stock should not exceed this quantity. It should be set on the basis of

- Rate of consumption,
- Risk of insolence and cost of storage.

Formula for computing it is

Maximum level =ROL + ROQ - (Minimum demand x Minimum re order period)

(b) Minimum stock level

This refers to the lowest level to which stock may fall it is the buffer stock. The quantity is fixed so that production and selling may not be held up due to shortage of material. It is set on the basis of

- Lead time i.e., times lag between indenting and receiving of the material. It is the time required replenishing the supply.
- Rate of consumption of the material during the lead time.
- Nature of the material: Minimum level is not required in case of a special material, which is required against customer's special order.

It can be calculated by following formula,

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

(c) Danger stock level

This means a level at which normal issues of material be stopped and issues are made only under specific instruction. The purchase officer will make special arrangements to get the materials, which reach at their danger levels so that the production may not stop due to shortage of materials. It can be calculated by following formula,

Danger stock level = Average consumption × Maximum re order period for emergency purchase (S. P. Jain and K. L. Narang, 1990).

2.2.1.4 Inventory Turnover

The relationship between sales and stock is known as inventory turnover. The ratio of sales to stock evaluates the efficiency of the company for sales directly because sale id supported by the level of inventory of finished goods. Generally higher ratio indicates the efficiency of the inventory management.

The liquidity of firm's inventory may be calculated by dividing the cost of goods sold by the firm's inventory.

Inventory Turnover = Cost of goods sold/Average Inventory

Where,

Average Inventory = $\frac{\text{Opening Inventory + Closing Inventory}}{2}$

The significance of inventory turnover is that it helps the analyst to measure the adequate of goods available to sell compared to the actual sells.

Either a high or low ratio may be an indication of poor management as follows.

(a) High turnover may indicate Future Storage

A high turnover results when the firm maintains extremely low stock of goods or raw materials. The low level of finished goods may indicate that firm will suffer a loss of sales due to an inability to deliver goods promptly. The low levels of raw materials could cause shut down of the firm's production line resulting in higher cost.

(b) Low turnover may indicate overstocking of inventory

A low inventory turnover results from excessive inventory being by the firm may be increasing high cost from overstocking finished goods on raw materials at same time. The firm may be absolute goods in its inventory.

Alternative calculation of inventory turnover

$$Inventory\ Turnover = \frac{Sales}{Inventory}$$

2.2.1.5 Selective Inventory Control: ABC Analysis

Usually a firm has to maintain several types of inventories. It is not desirable to keep the same degree of control on all the items. The firm should pay maximum attention to those items whose value is the highest. The firm should, therefore classify inventories to identify which items should receive the most effort in controlling. The firm should be selective in its approach to control investment in various types of inventories. This analytical approach is called the ABC analysis and tends to measure the significance of each item of inventories in terms of its value. The high value items are classified as 'A items' and would be under the highest control. 'C items' represent relatively least value and would be under simple control. 'B items' fall in between these two categories and require reasonable attention of management. The ABC analysis concentrates an important item and as also known as control by importance and exception (CIE) (Richmond, Herbert J., 1969).

As the items are classified in the importance of their relative value, this approach is also known as proportionate value analysis (PVA).

The following steps are involved in implementing the ABC analysis:

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

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

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

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

5. Combine items on the basis of their relative value to form three categories-ABCS.

Advantages of ABC Analysis

1. A strict control is exercised on the items, *which* represent a high percentage of the material costs. Managerial time is spent on "A" item where as "C" items and sometimes "B" items can be handled by clerical staff with least managerial supervision. Equal attention to all the item of stores is not desirable because it is expensive.
2. Investment in inventory is reduced to the minimum possible level because a reasonable quantity of "A" items representing a significant portion of the material costs is purchased to reduce investment in the materials close control of "A" items contributes much more than close control of "C" item.

Storage cost is reduced as a seasonable quantity of materials, which account for high percentage of value of consumption, will be maintained in the stores [Jain, S.P. and Narang, K.J. 1995]

2.3 Inventory Valuation

In any firm different goods are purchased at different time at different price rate. But the problem to assign value to these goods, emerged to identify the position of current assets of the firm. Balance sheet of the firm should show true and fair view of the financial position of the firm. For these purpose assets including inventory-should be properly valued to exhibit a true and fair view. True profits cannot be calculated unless assets are property values.

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

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

2.3.1 Specific identification Method

This method requires that each unit in inventory to be identified with the particular time it be purchased. This is easiest when the items have serial number or are distinguishable by model, colour, or size because account must be able to identify the particular item in order to find the date of purchase. This is suited to low volume high cost item such as automobile, boat, fur-coat, jewelers etc.

2.3.2 First in First out Method [FIFO]

In this method the earlier lots of materials or good purchased or goods manufactured are exhauster first and closing stock is out of the latest consignment received or good manufactured and is valued at the cost of such goods. In other words, cost of goods sold is calculated keeping in view the earliest lots exhausted on the presumption that units are sold in the order in which they were acquired. [Jain and Narang 1994]. Similarly, the ending inventory is valued at the unit cost of most recent acquisitions, which means that the units assumed to be included in the cost of goods sold has been purchased earlier. [Shrestha, M.K. 1980]

2.3.3 Last in First Out [LIFO]

As in first in first out method, latest consignments of materials are exhausted first under this method. Therefore, closing stock is valued at the cost of the earliest lot on hand the cost of goods sold is based on the cost of recently purchased goods [Jain and Narang, 1994].

2.3.4 Weighted Average Cost of Capital Method [WACC]

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

2.3.5 Inflation Price Method

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

2.3.6 Higher In First Out Method [HIFO]

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

2.3.7 Market Price Method

Market price either is the replacement price or the realizable price. The replacement price is used in case of items that are held in stock for use in production while realizable price is used in respect of the items that are kept in stock for sales. This method of valuation of stock is followed when the market value is lower than the cost so that possible losses may be provided for. This method can also be successfully used for the valuation for obsolete items of stock, which has been lying in the store for a long time. [Jain and Narang. 1994]

2.4 Just-In-Time Inventory (JIT)

The management of inventory has become very sophisticated the recent years. In certain industries the production process lends it self to 'Just in time' inventory control. As the name implies, the idea is that inventories are acquired and inserted in production at the exact times they are needed. This requires efficient purchasing, very reliable suppliers and efficient handling system. One thing that has made this possible is the advent of instant information through sophisticated computer networks. [Vanhome, J.C. 1990]

2.5 Inventory and the Financial Manager

The inventory control methods give us a means for determining an optimal level inventory, as well as how much should be ordered and when. These tools are necessary for managing inventory efficiently and balancing the advantages of

additional inventory against the cost of carrying it. Computers ha-\ e opened new words to inventory control and operation research has many application to inventory management. Monitoring amounts and tied up inventories are the important aspects of this.

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

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

The financial manage is concerned also with the risks involved in carrying inventory. The major risk is that the market value of specific inventories will be less than the value at which they were acquired. Certain types of inventory are subject to obsolesce, whether it is in technology or in consumer tastes. A change in technology may make and electronic component worthless. A change is style may cause a retailer to sell dresses at substantially reduce price. Other inventories, such as agricultural products are liable to physical deterioration, of course, inventories will have to sell at lower and lower prices, all other things being the same. In other situations, the principal risk is that of fluctuations in market price. Some types of inventory such as copper are subjected to rather wide price swings. The financial manager is perhaps in

the best place to make an objective analysis of the risks associated with the firms investment in inventories. These risks must be considered in determining the appropriate level of inventory the firm should carry.

The opportunity cost of funds is the link by which the financial managers tires inventory management to the overall objectives of the firms. In this regard, inventory can be treated as an assets to which capital is committed, as any capital budgeting project. Differences can be incorporated into an analysis of risk. Similarly to that for capital budgeting. We know that the greater the efficiency with which the firm manages its inventory, the lower the required investment and the greater the shareholders' wealth, all other things being the same [Vainhorne, J.C. 1990].

2.6 Review of Related studies on Inventory Management

2.6.1 Review of Articles/ Journals

Prof. Dr. Pradhan Radheshyam. (2003) a collection of the selected published and unpublished research works in Nepalese finance under those books Pradhan studied formal Reposed *"Prediction of Financial Distress in Nepal: A Consensus Approach."* This study provides behavioral evidence from 63 executives of Nepalese industries on the appropriateness of the choice of variables of prediction of financial distress. The study indicated the consensus on the short-term liquidity ratio as the important indicators of financial distress. The study also revealed that there is no significant difference between the choice of financial ratios by the private and public sector enterprise. This study was based on primary data generated through questionnaire. Nineteen enterprise in public sector and forty four enterprise in private sectors covered in this study represents the major enterprise in Nepal.

Paudel Kalpana. (2005) *"The Predictive Power of the Ratios of Nepalese Manufacturing Pes"* was written February 1991. It analyzed six years financial statement from 2039/40 to 2044/45 B.S. Paudyal took four profit making, four loss incurring and two other types (total ten) mfg. public enterprises for the study. The study analyze the liquidity turnover, leverage and profitability ratios of manufacturing PEs and to judge their predictive power, to identity the appropriate ratio, to predict the financial health and performance of manufacturing PEs.

Barcodesinc. (2012) Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer in of units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. Competent inventory management also seeks to control the costs associated with the inventory, both from the perspective of the total value of the goods included and the tax burden generated by the cumulative value of the inventory. Balancing the various tasks of inventory management means paying attention to three key aspects of any inventory. The first aspect has to do with time. In terms of materials acquired for inclusion in the total inventory, this means understanding how long it takes for a supplier to process an order and execute a delivery. Inventory management also demands that a solid understanding of how long it will take for those materials to transfer out of the inventory be established. Knowing these two important lead times makes it possible to know when to place an order and how many units must be ordered to keep production running smoothly. (Google search, www.barcodesinc.com/articels)

Charles Dominick. (2012) Inventory management is primarily about specifying the shape and percentage of stocked goods. It is required at different locations within a facility or within many locations of a supply network to precede the regular and planned course of production and stock of materials. The scope of inventory management concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods, and demand forecasting. Balancing these competing requirements leads to optimal inventory levels, which is an on-going process as the business needs shift and react to the wider environment. (Wikipedia.org/wiki/inventory_management)

2.6.2 Review of Related Thesis

Kshetri, Ram Bahadur, (2002) Conducted his master thesis on "Inventory Management of Agriculture Inputs Corporation". the overall objective of this syudy is analizing the inventory management of AIC in kathmandu valley. The study is based in quantitative aspect only. His research work had the following objectives.

- To study the present procedure of chemical fertilizer in AIC.
- Whether AIC has maintained the ideal mix of various fertilizer i.e. Nutrients.
- To study and analyze the present position of inventory management of AIC.

From the analysis and interpretation of available of data Mr. Kshetry has made major findings are as follows.

- AIC's main objective is to increase production and productively in agriculture inputs to the farmers timely, at reasonable price and right quantity.
- Most of farmers are under the stark properly. So they are nearly unable to buy and apply expensive chemicals fertilizers in their farm.
- Government to inspire to the farmers to use chemicals fertilizers has been providing subsidy in price and transpotation cost consequently.

Kandel Bal Dip, (2004) has conducted a study on "A study on Inventory Management of Royal Drugs Ltd." The main objectives of the study are:

- To assess the types of inventory maintained on RDL.
- To examine the technique employed to manage inventory in RDL.

Some major findings pointed out based on his analysis works are as follows:

- When and how must to order is estimate haphazardly the RDL.
- No modern models to used inventory control system.
- The companies have not recognized the minimum stock and re-order level.

Khanal Pitambar, (2005) conducted a research world on "Inventory Management System of Gorkhapatra Corporation." The main objectives of this study identify the problem underlying in inventory management and control system of GPC. Other objectives are;

- To examine the existing inventory system of applied by GPC.
- To determine optimal inventory level of major raw materials.
- To analysis there relationship between inventory materials cost and profit.

On the analysis and presentation of available of data, the major findings of his study are:

- GPC not has followed any scientific tools and technique of inventory management system.
- Raw materials are imported from various countries.
- Unnecessary cost involved in ordering cost and carrying cost.

Lamichhane Surendra, (2005) has studied on "Inventory Management of Nepal Lever Ltd." For his thesis some objectives review in below.

- To identify the present inventory position of Nepal Lever Ltd.
- To examine the technique being employed to manage inventory of NLL.
- To know the relationship sales and inventories with identifying their trends.

On the analysis and presentation of available of data Mr. Lamichhane made the following major findings is derived.

- NLL is use bin card technique to control the inventory costs.
- The scientific model EOQ is not used during the study period.
- Only ABC model used but not appropriate method.

Balika, (2007) has studied about the Inventory Problems of Hetauda Cement Industry Limited. His Main objectives are as follows;

- To find the present inventory position and problems in managing inventory.
- To find out the proper system for material purchase.

Major findings:

- The company uses following EOQ model in material purchasing decision.
- The investment in inventory stock of HCIL is in large amount.
- Company search the new scientific technology.

Acharya, (2010) has conducted the research work on the topic of "Inventory Management of Nepal Food Corporation". His Main objectives are as follows;

- To analyze the relationship among sales and inventories.
- To analysis ordering system of the company.
- To suggest proper inventory model to RDL bases on analysis.

His Major findings:

- There is no evidence of taking discount by AIC. Lead-time is not calculated properly.
- AIC using ABC analysis also.

2.7 Research Gap

Although there are various studies related to inventory management regarding different organizations and available in different libraries, but review literature indicates that there are few studies devoted to inventory in Nepalese context. These few studies conducted earlier have now needed to carry out a study to assess the recent development in inventory management. This study covers the data of five years. Nobody of the earlier studies had focused on role of inventory in over all profit planning of the organization although inventory and different components of profit planning like production planning, purchase planning etc are closely related to each other. Similarly nobody had shown the relationship of inventory with sales, production and purchase although they are closely related to each other. Moreover this study has not been done by previous researcher as separately. In spite of above, multiple gaps among the researchers view as well as there is time gap regarding the study of inventory management.

CHAPTER - III

RESEARCH METHODOLOGY

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

Research methodology is the way to solve systematically about the research problem (Kothari, C.R. 1998). It is the process of aiming at the solution of problem through the planned and systematic dealing with collection, analysis and interpretation of fact and figures. The major objective of this study is to analyze the inventory management of BNL.

For the purpose of achieving the objectives, the following methodology[7] has been adopted which includes research design, population & sample, nature of data, data gathering procedure and presentation and analysis techniques.

3.1 Research Design

The formidable problem that follows in the task of defining the research is the preparation of the research project, popularly known as research design (Pathak, J.R. 1982). The research design is the plan structure and strategy for investigation of the facts in order to arrive at conclusion. The plan is the overall scheme of program of research. It includes and outlines of what the investigator will do from writing the hypothesis and their operational implication to the financial analysis of data (Wolf Howarld, K and Pant, P.R.). This research design is plan to obtain the answer of research question through analysis of data.

This study entitles 'Inventory Management of BNL' deals with procurement sales and distribution procedure, trends of inventory management of BNL, which were the variables under the study, so the analytical and descriptive research have been applied as research design.

3.2 Population and Sample

There are large numbers of manufacturing companies in Nepal. But only one company BNL has been selected for this study purpose.

3.3 Nature and Sources of Data

Both primary and secondary data have been used in this study. Primary data are based on interviews as well as unstructured dialogues and discussions with staff of BNL, While secondary data were collected from the following sources.

i. Published and unpublished documents related to BNL
ii. Books, articles, magazine and official records of BNL
iii. Studying and analyzing the annual reports of BNL

3.4 Data Gathering Procedures

Data gathering, which is most important part of the research, consists of obtaining information from somebody's hand. It is therefore very difficult activity of the whole research process. Researcher has made frequent visits to BNL office in order to collect the required data from officials.

Published and unpublished documents, books, articles, magazine and the official records are the main sources of secondary information. While the primary sources consisted *were* interviews, dialogue and discussion with the concerned parties.

3.5 Data Period Covered

The study covers the period of five years i.e. 2006/07 to 2010/11.

3.6 Methods of Data Analysis

Inventory management involves determining how many inventories to hold? When to place order? How many units to order at a time? In order to achieve the organization's goal there is a need of effective inventors' management system. In this study, data collected from various sources were managed, analyzed, and presented in proper way including table, figures and graphs with proper interpretation and

explanation. The inventory management techniques applied in this study are Economics Order Quantity (EOQ), re-order level, inventory turnover ratio, and ABC analysis, which are the part of financial analysis. However the statistical techniques included in the study are mean, standard deviation, coefficient of variation, Karl-Pearson's coefficient of correlation, and trend analysis.

3.6.1 Descriptive Analysis

Descriptive analysis consist the purchase practice, store control device and process of issuing materials in BNL.

3.6.2 Inventory Management Tools

Inventory management tools are used to analyze the inventory management aspects of BNL. The inventory management tools applied in the study is as follows

3.6.2.1 Economic Order Quantity (EOQ)

The economic order quantity may be defined as that level of inventory order that minimize the total cost associated with inventory management. In terms of calculation, EOQ is calculated in Rupees due to the unavailability of data in quantity.

EOQ can be determined by following way

i. Formula method

ii. Table method

iii. Graph method

i. Formula Method

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

Where,

EOQ = Economic Order Quantity O= Ordering cost

A = Annual Requirement C= Carrying cost

Thus, EOQ mainly depends on two types of costs

a. Ordering Cost

Ordering costs are also termed as preparation costs. These are the costs, which are incurred in connection with ordering and procurement. They are primarily fixed cost relating to the starting of production or the writing of an order for purchase and don't vary with the number of items in the lot. In BNL ordering costs includes.

- Set up cost of machine and finished goods inventory
- Clerical costs
- L/C Charge

b. Carrying Cost Inventory

Inventory carrying costs are also known as stock holding costs or what called as inventory holding costs. These costs vary directly with the number of items involved. BNL carrying costs are:

- Interest on capital investment
- Clerical and staffs
- Loss due to pilferage, spillage, deterioration and obsolescence
- Insurance

ii. Table Method

Year	Average Inventory
Number of order (N)	Total carrying cost
Annual requirement (A)	Total ordering cost
Order size (Q)	

Where,

$$\text{Order size} = \frac{Annual\ requirement}{Number\ of\ order}$$

Average inventory = $\frac{Order\ \ size}{2}$

Total Carrying Cost = Carrying cost per unit × Average inventory

Total Ordering Cost = Total Cost of an order × Number of order

3.6.2.2 Inventory to Total Assets (ITA)

This ratio indicates the percentage of total invested in the form of inventories. It is calculated as:

ITA= $\frac{Invntories}{Total\ \ Assets} \times 100$

The increase in the ratio indicates liberal inventory policy of blocking of materials in stock.

3.6.2.3 Inventory Conversion Period (ICP)

The inventory conversion period is calculated by dividing inventory by the cost of goods sold per day. It is computed as

ICP = $\frac{Inventory}{Cost\ \ of\ \ goods\ \ sold\ /\ 360}$

The inventory conversion period is the average length of time required to convert materials into finished goods and then to sell these goods. It is the amount of time the product remains in inventory in various stages of completion.

3.6.2.4 Payable Deferred Period (PDP)

It is calculated by dividing account payable by the daily credit purchase, mathematically it can be expressed as:

PDP = $\frac{Account\ \ Payable}{Cost\ \ of\ \ goods\ \ sold\ /\ 360}$

The payable deferred period is the average length of time between purchase of raw materials and labor and the payment of cash for them.

3.6.2.5 Inventory Turnover (IT)

Inventory turnover is calculated to show the rate of turn over of stock. This will show how many times the stock has turned over, when the figure of numbers of times of going on increasing, indicating a trend that the stock is fast moving from reference point of view. This ratio should be 7 to 18 times. This ratio is worked out by dividing the COGS with the average inventory. We can write this as:

$$\text{Inventory Turnover} = \frac{Inventory\ Turnover}{Average\ Inventory}$$

This ratio is an indication of the efficiency of the management of finished goods stock. If the ratio is high, then the efficiency will be considered to at high level but if the ratio is low, then steps will have to be taken to increase sales. Otherwise liquid position of the concern will be adversely affected and the concern might run the risk insolvency.

3.6.2.6 Inventory to Current Assets (ICA)

This ratios shows the percentage of inventories to current asset and it is calculated as:

Inventories

$$\text{ICA} = \frac{Inventories}{Current\ \ Assets}$$

The increase in the ratio is an indication of liberal inventory policy followed by the company.

3.6.3 Statistical Tools

Statistical tools used for the study are Karl Pearson's Correlation Coefficient, Time Series / Trend analysis and Probable error. The brief descriptions of each of these are made below.

3.6.3.1 Karl Pearson's Correlation Coefficient

This method popularly known as Pearson's coefficient of correlation is widely used in practice. This is a mathematical method of measuring the degree of association between two variables say X and Y. In this study, the correlation analysis is used to test the relationship between the following variables.

- Annual required and annual purchase
- Sales and closing stock
- Purchase and closing stock
- Sales and purchase

According to the Karl Pearson correlation coefficient is calculated as follows:

$$r = \frac{n\Sigma dxdy - (\Sigma d_x)(\Sigma d_y)}{\sqrt{\left[n\Sigma d_x{}^2 - (\Sigma d_x)^2\right]\left[n\Sigma d_y{}^2 - (\Sigma d_y)^2\right]}}$$

Where,

X = the first variable

Y = the next variable

N = Number of years (Observation)

D_x = Deviation of the first variable from its assumed mean

D_Y= Deviation of the next variable from its assumed mean

3.6.3.2 Time series (Trend analysis)

The trend lines describe the average relationship between the two series. In fact, there is no difference between the lines of the best fit and the regression lines. The term line of the best fit is generally used, when X-series related to time and Y - line of best fit is known as line of regression. The equation describing the regression lines is called regression equation.

Y= a bx

Where.

Y = the estimated value of Y for given value of X obtained from the line of regression of Y on X.

a = Intercept or mean value of Y

b = Slope of trend lines / rate of change

X = Time (in times series analysis)

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

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

Where,

a = Regression constant (Intercept)

b = Regression coefficient of change

SY = Total Value of Dependent variable

ΣXY = Total value of the produce of items in the two series

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

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

CHAPTER - IV

PRESENTATION AND ANALYSIS OF DATA

The main objective of the study is to examine the present practice and problems of inventory management system of Bottlers Nepal Limited. Thus in this contexts, this section analyze the relevant secondary data and information regarding inventory management of the company which are presented in suitable format.

To achieve the fulfill result, available data are presented in table and graph and they are analyzed with the help of statistical, mathematical and inventory management tools and finally interpreted to explore the facts related to inventory management in BNL. In this regard mainly secondary data is taken through the financial report from 2006/07 to 2010/11.

4.1 Descriptive Analysis

In this study purchasing procedure, store control device and issuing materials of BNL are the descriptive analysis.

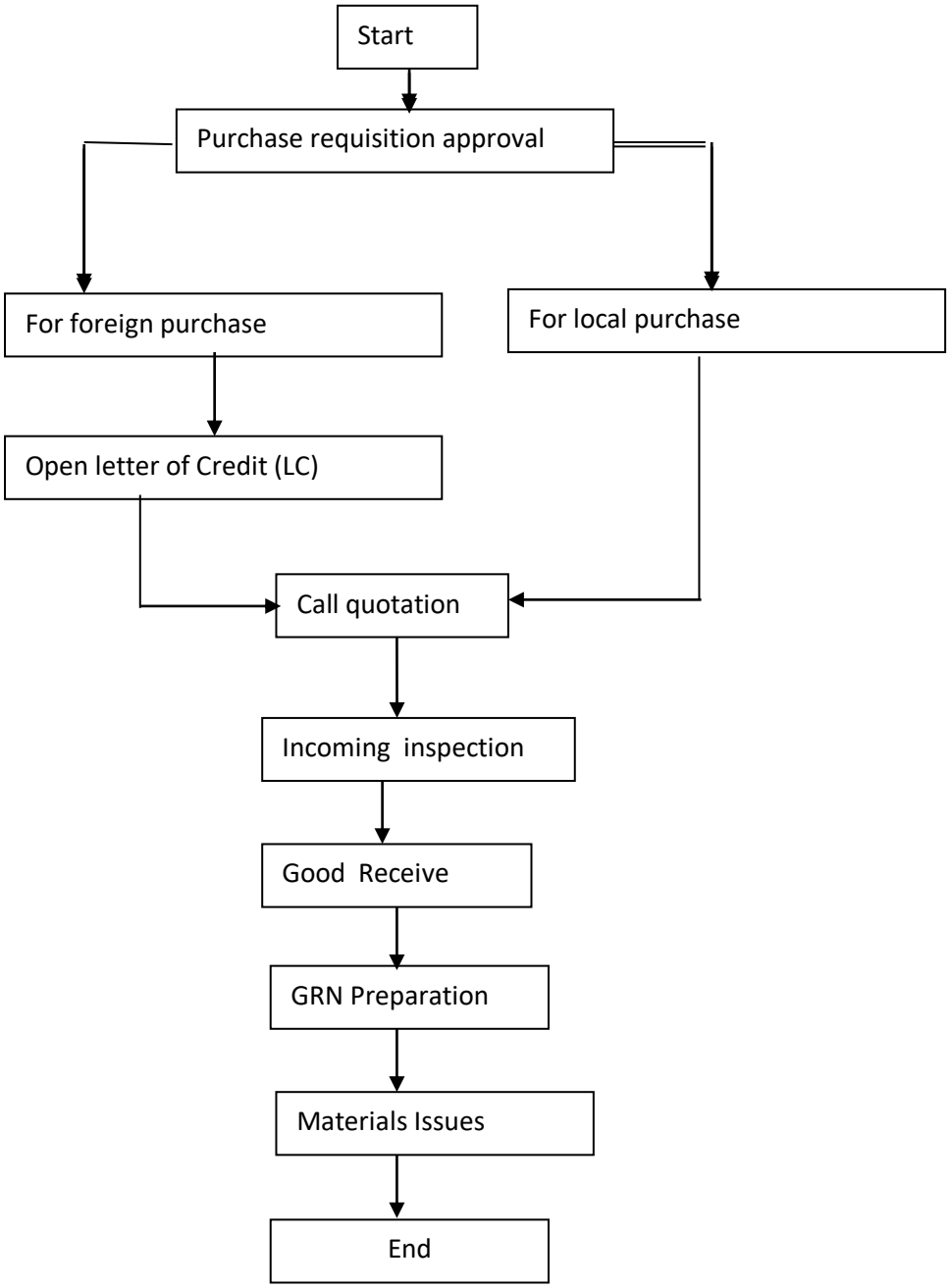
4.1.1 Purchasing Procedure in BNL

For the production of any product purchase is required. It is the first important function of purchasing. BNL is the manufacturing company, so it requires various types of raw material such as concentrate crown cock, closure, sugar, co2 gas etc for the production of different soft drinks.

If the BNL wants continuous production operation, it should have regular supply. By using specific purchasing procedure required raw materials for the factory are purchased (fig 4.1).

Figure: 4.1

Purchasing procedure of essential in BNL



Each of the steps in the purchasing procedure also follows the strict systematic sequence, which is described briefly hereunder.

4.1.1.1 Collection of purchase requisition

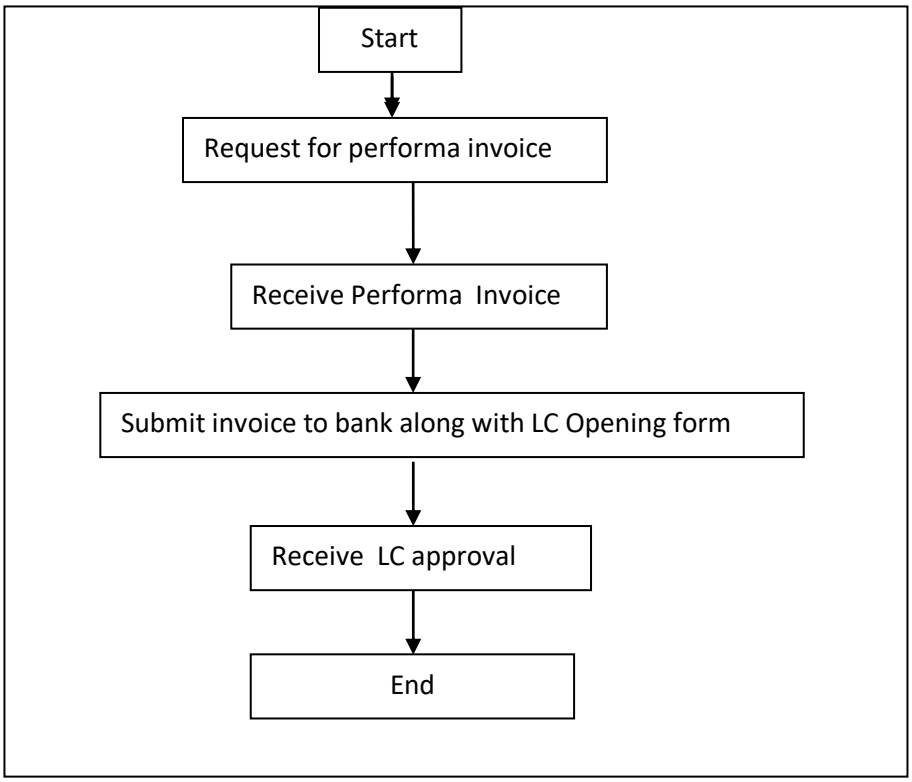
Purchasing procedure starts immediately with collection of purchase requisition form from the respective department for the supply of essential.

4.1.1.2 Approval of purchase requisition

Once the concerned organization approves the different raw materials. It fills the purchase requisition form. Store department checks the availability of that raw material in store. If it is available in sufficient quantity t the store then the process is cancelled in this stage. But if not it will be further proceed to finance department and then to general manager for this approval. Finally purchase department will be prepared for purchase of the goods. Flow of the process is presented in figure 4.2.

Figure: 4.2

Approval of purchase requisition of BNL



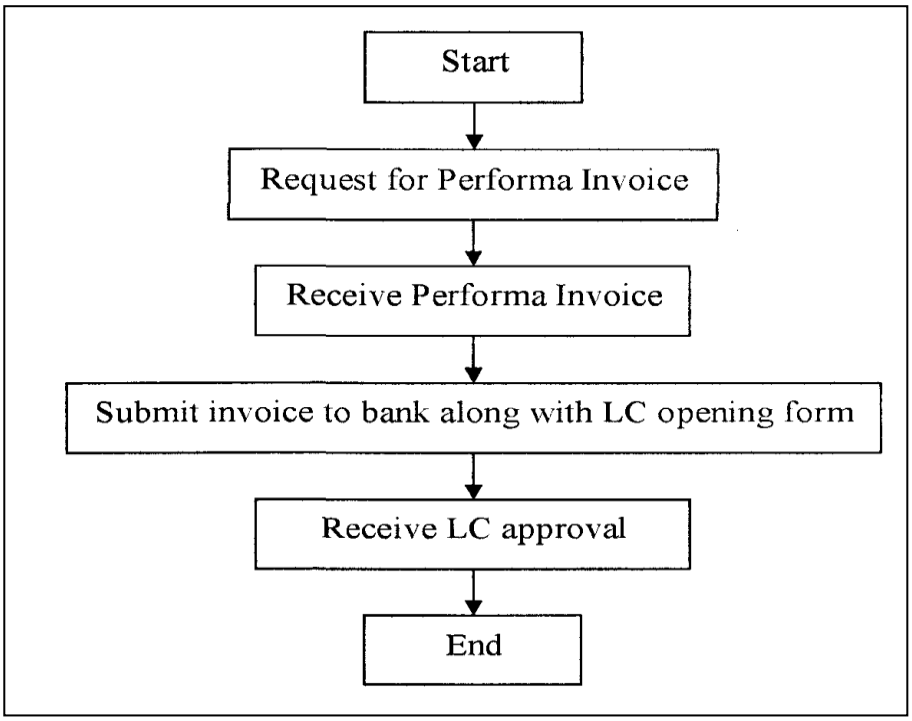
Source: Provided by BNL

4.1.1.3 Opening of letter of credit (LC)

It is generally applicable for import of materials from foreign countries. Opening of LC starts with the request for Performa in voice to the bank. After receiving such Performa invoice, it will submit to concern bank along with LC opening form. At the end the bank provides LC approval. Figure 4.3 shows the steps of opening LC.

Figure: 4.3

Opening of Letter of Credit (LC) of BNL



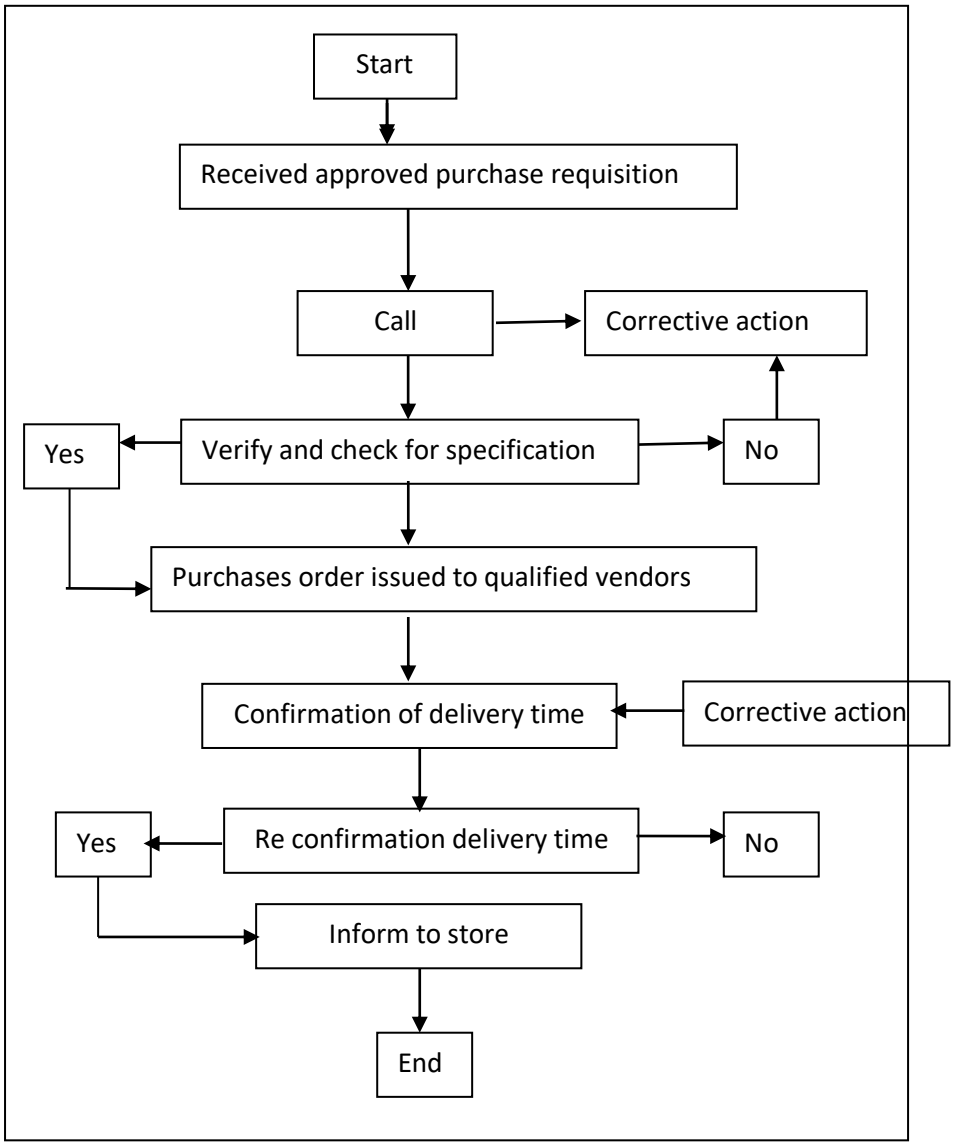
Source: Provided by BNL

4.1.1.4 Purchase Procedure

Approval of purchase requisition now leads to call for quotation so that the given quality and quantity of materials could be applied at the minimum possible cost. If any dissatisfaction arises during verifying and checking for specification of goods quotation will be re-called otherwise purchase order will be issued to qualified suppliers specifying the delivery time and then store will be informed for date and quantity of goods arrival. Figure 4.4 shows the sequential steps of the purchase procedure.

Figure: 4.4

Purchasing procedure of essential in BNL



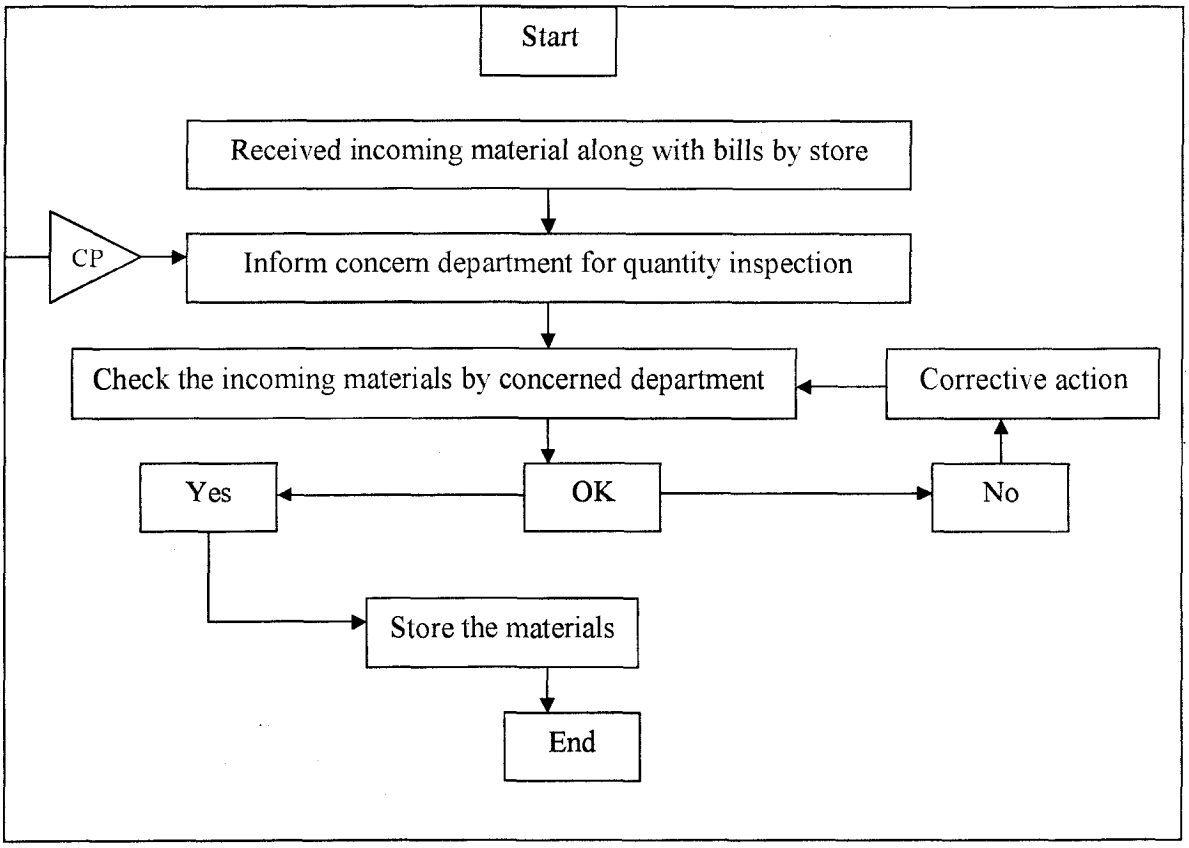
Source: Provided by BNL

4.1.1.5 Incoming inspection

Once the incoming material is received along with the bills by the store, the concerned department has to be informed for quantity inspection. The responsibility of verifying the weight, count or measurement is that of the receiving department, but the responsibility to see whether that goods have been received according to purchase order specifications, is that of inspection department. Therefore the concerned department then checks the incoming materials, which must have to be taken to .ensure the correct material of specified quality at correct amount. The follow of action of coming inspection is presented in figure 4.5.

Figure: 4.5

Incoming inspection of BNL



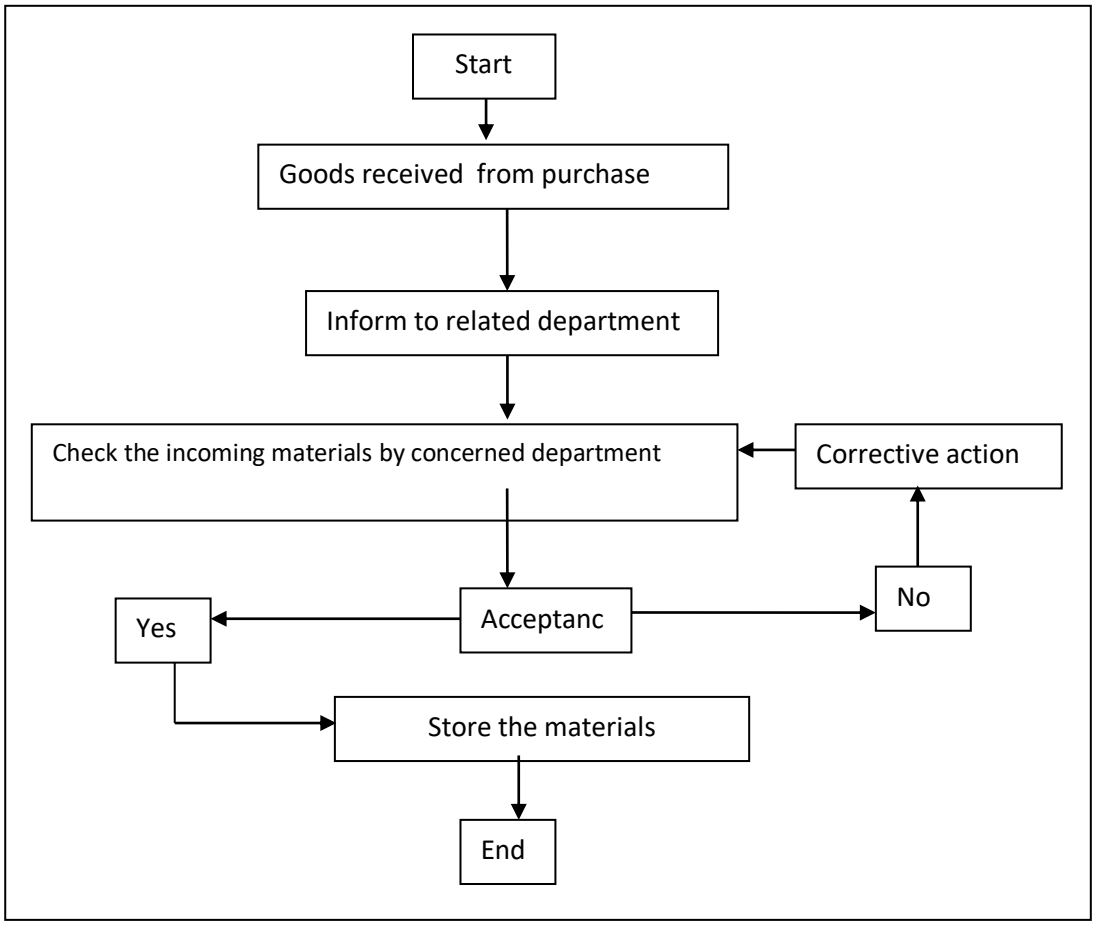
Source: Provided by BNL

4.1.1.6 Goods receiving process

Once the incoming goods are accepted after inspection for its quality and quantity they are received. After receiving the goods from purchase the related department has to be informed for its acceptance. Then it finally will go to storage from where the concerned department acquire as per it needs. Figure 4.6 shows the goods receiving process.

Figure: 4.6

Goods receiving process of BNL



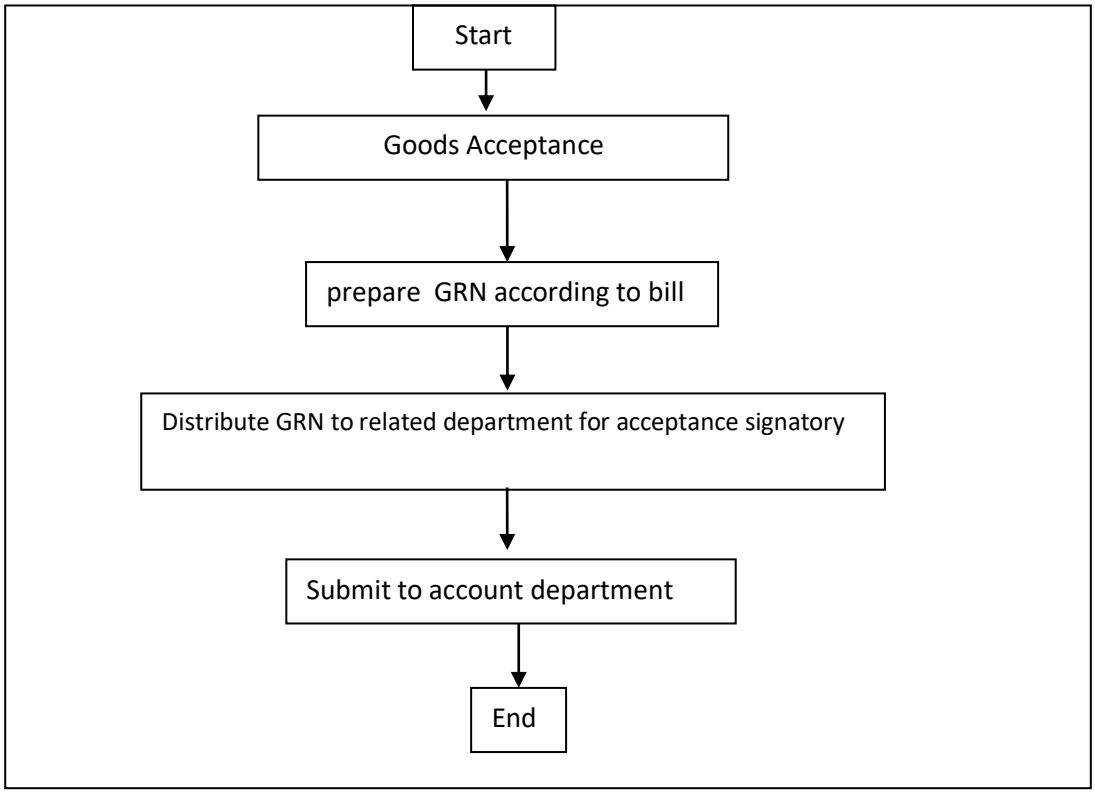
Source: Provided by BNL

4.1.1.7 GRN preparation

GRN should have to prepare after the goods are accepted. This GRN will further distributed to related department for acceptance signatory. Then finally it has to be submitted to account department. Process of GRN preparation is presented in figure 4.7.

Figure: 4.7

GRN Preparation on BNL



Source: Provided by BNL

4.1.2 Store Control Device Practice

Store keeping function includes the function of keeping the materials in the store and keeping their movements. The cost of materials holding in the store directly affects the total cost associated with holding inventories. To minimize the cost of holding material in the store all company generally use different types of controlling device. Some of the store control device adopted by BNL is Bin cards, Store ledger and ABC analysis. The brief descriptions of these are presented as follows.

4.1.2.1 Bin Card

Bottlers Nepal Limited is using the bin card in the form of loose sheets to keep the complete records of the receipts and issues of each item of material in terms of quality as well as balance quality. In the loose sheet each item of stores, minimum

level and reorder quantity are applied. So by seeing the loose sheet, the storekeeper can send the material requisition for the purchase of material in time.

4.1.2.2 Store Lodger

The company is maintaining store ledger to keep the complete record of material purchase, issued and balance in terms of quality as well in term of value

4.1.2.3 ABC Analysis

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

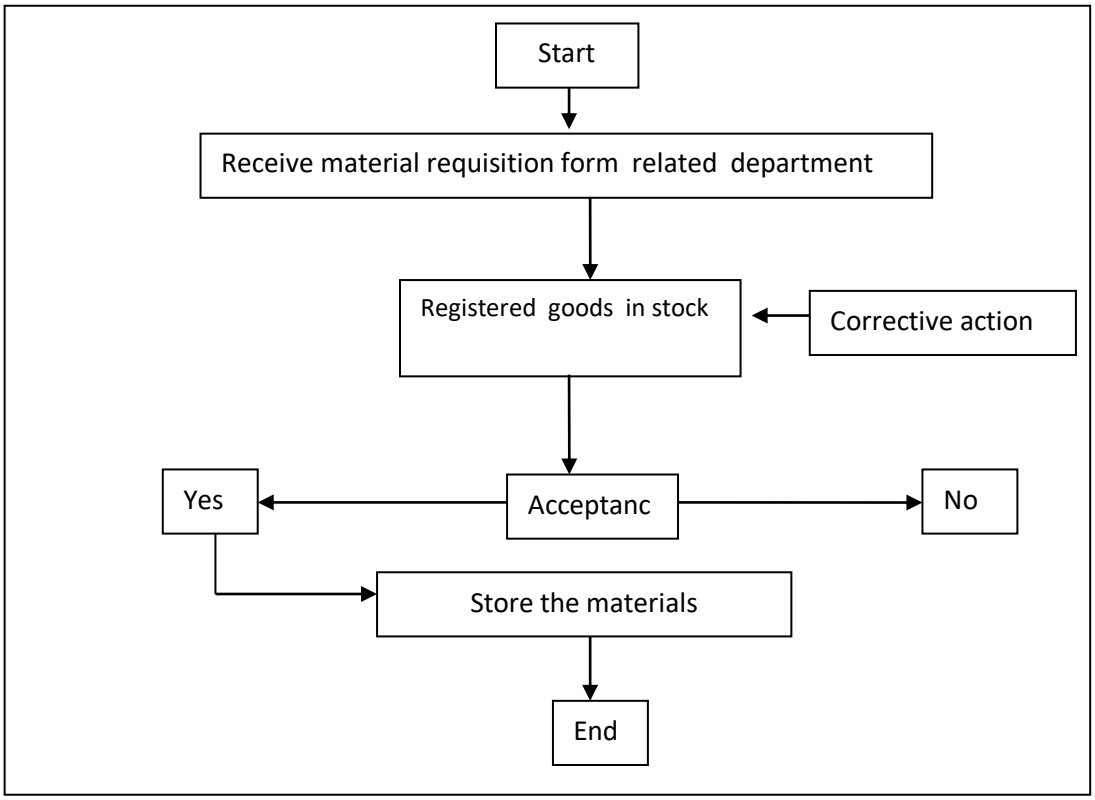
The reason for not applying ABC technique to control the inventory in store may be due to obscurity of the management about its advantages. If the company wants to minimize the holding cost of inventory and investment on inventory, the company should use ABC analysis technique.

4.1.3 Issuing Material

After receiving material requisition from the related department store check the registered goods in stock. Then the stock verification will be made. If it goes negatively, corrective action has to be taken. Otherwise material will be issued to the related department as per requisition. Material using process is presented in figure 4.8.

Figure: 4.8

Issuing material from store in BNL



Source: Provided by BNL

4.2 Inventory Management Analysis

Under this section different analytical tools of inventors[7] tools of inventory management and other statistical methods of analysis are used as that are started in previous chapter, methodology.

4.2.1 Annual Requirement, Annual Purchase of Raw Material

The table 4.1 shows the annual requirement and annual actual purchase of raw materials made by the company on different years. There is an erratic rise and fall in both annual requirements and annual purchase of raw materials for the given years. The annual requirement and purchase of raw materials as follows:

Table: 4.1

Relationship between annual requirements and annual purchases

(in million)

Years	Annual Requirements	Annual purchases
2006/07	154.92	155.92
2007/08	177	176.42
2008/09	117.80	118.17
2009/10	173.20	172.97
2010/11	153.70	152.88
Average	155.32	155.27
S.D.	23.45	23.15
C.V	15.10	14.91

Average annual requirement is 155.32 million and average of annual purchase is 155.27 million. It found less purchased than the requirement raw material. Hence it shows that, actual purchased is less due to competitors and external environment. The company have sufficient raw material and utilize effectively in a productions.

4.2.2 Relationship Between Actual Sales and Closing Stock

The table 4.2 shows the relationship between actual sales and closing stock. The table gives the picture of actual sales and closing stock from FY 2006/07 to 2010/11.

Table 4.2 shows that there is fluctuation in both sales and closing stock. However, change in both variables are not well defined, there is incremental rise and fall in both variables during five years period of time. This table presents closing stock is not changes according to sales.

Table: 4.2

Relationship between actual sales and closing stock (Rs in million)

Year	Actual Sales	Closing Stock
2006/07	632.11	92.26
2007/08	614.74	151.62
2008/09	621.83	89.81
2009/10	634.20	102.5
2010/2011	746.58	67.86
Average	649.89	100.81
Standard deviation	54.62	31.08
Coefficient of variation (cv)	8.40	30.83
Correlation coefficient	-0.67	

Source: Annual reports of BNL (2006/07 to 2010/11)

Mean standard deviation and coefficient of variance are calculated to analyze the nature of variability of sales and closing stock. The average actual sale of BNL for given five years is Rs 649.89 millions. Deviation of annual sales, calculated as standard deviation is 54.62 and 31.08 for annual sales and closing stock, respectively. This signifies that closing stock more consistent compared to actual sales. But CV indicates that closing stock fluctuates more than the actual sales. Coefficient of correlation for these two variables is -0.67. Here negative sign indicates the negative relation between sales and closing stock. Table 4.2 also presents the calculation of mean, standard deviation, coefficient of variation and coefficient of correlation and probable error of actual sales and closing stock.

4.2.3 Relationship Between Actual Raw Material Purchase and Closing Stock

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

delivery at the correct time at the most favorable price from out side the organization. BNL has purchased all types of raw materials from other countries except CO_2 gas. Similarly closing stock means inventory at the end of the month or year. The following table 4.3 shows the data of purchase and closing stock of BNL for the entire study period of 2006/07 to 2010/11. Though the table 4.3 shows the overall increment in both purchase and closing stock, there is rise and fall in for the given period of time.

In addition to find out the nature of variability of actual purchase and closing stock of different year's standard deviation and coefficient of variation along with mean was calculated. Together with measure to dispersion, correlation coefficient is also calculated to analyze the relationship between actual purchase and closing stock.

Table: 4.3

Relationship between actual purchase and total closing stock (Rs in million)

Year	Actual Purchase	Closing stock
2006/07	354.9	92.26
2007/08	347.87	151.62
2008/09	224.05	89.81
2009/10	369.28	102.51
2010/2011	351.27	67.86
Average	329.47	100.81
Standard deviation	59.50	31.08
Coefficient of variation (CV)	18.06	30.83
Correlation coefficient	0.17	

Source: Annual reports of BNL (2006/07 to 2010/11)

Average actual purchase is Rs.329.47 millions with standard deviation of 59.50 from average purchase. Similarly average closing stock is 100.81 million with standard deviation of 31.08 from average closing stock, relatively less deviation compared to purchase. Relating to the uniformity or stability of actual purchase is found relatively stable compared to closing stock, which is shown by the lower value of coefficient of variation for actual purchase i.e. 18.06% compared to that of closing stock i.e. 30.83%.

On the other hand, correlation coefficient is calculated to analyze the relationship between actual purchase and closing stock. The positive value of correlation coefficient between actual purchase and closing stock justify the positive relation between these two variables. This means that movement of both variables in same direction i.e. increase in actual purchase resulted into increase into closing stock and similarly decrease in actual purchase resulted into decrease in closing stock. In addition to this the value of correlation coefficient shows the low degree of positive relationship-between these two variables i.e. 0.17.

Probable error was also measured the reliability of the value of Pearson's correlation, and conclude whether simple correlation coefficient is significant or not.

4.2.4 Investment in Inventories in Relation to Total Assets

The inventory indicates the stock of raw materials. Inventory of raw materials is very important for the manufacturing company like BNL. The shortage of inventory causes either stoppage of production resulting into failure to meet the demand of customers. On the other hand the excess investment in inventories causes the unnecessary holding of capital. It increases the inventory holding cost. The following table 4.4 shows the proportion of inventory to total assets.

Table: 4.4

Total inventory and total assets (in Millions)

Years	Total Inventory	Total Assets
2006/07	92.26	886.66
2007/08	151.62	975.27
2008/09	89.81	1048.35
2009/10	102.5	1255.77
2010/11	67.86	1190.16
Average	100.81	1071.24

Source: Annual reports of BNL (2006/07 to 2010/11)

Table: 4.5

Inventory to total assets of Bottlers Nepal Limited (BNL)

Year	06/07	07/08	08/09	09/10	10/11	Average	SD	CV
Ratio (%)	10.41	15.55	8.57	8.16	5.70	9.68	3.68	38.08
Change (%)	-	49.37	(44.89)	(4.78)	(30.14)	(7.61)	(41.44)	(-544.56)

Source: Annual reports of BNL (2006/07 to 2010/11)

$$Ratio = \frac{Total\ inventory}{Total\ Assets} \times 100$$

$$= \frac{92.26}{886.66} \times 100 = 10.405\%$$

$$Change\% = \frac{New - Old}{Old} \times 100$$

$$= \frac{15.55 - 10.41}{10.41} \times 100 = 49.38\%$$

so on …

The above table 4.5 shows the percentage of inventory with respect to its total assets in FY 2006/07 to 2010/11. In FY 2006 it is 10.41% of total assets and is increased by 49.37% and reached to 15.55% for the year 2007. In FY 2008 the ratio is 8.57% to total assets, which is decreased by 4.78%, Again there is declining ratio by 30.14% for the year 2010.

4.2.5 Proportion of Inventory in Relation to Current Assets

The company should maintain the adequate level of inventory to meet the demand. The inventory of raw material work in process and finished goods is also major sources of current assets.

Table: 4.6

Proportion of inventory to current Assets of BNL

Year	Inventory (Rs in million)	Current assets (Rs in million)	Proportion of inventory on total C.A.
2006/07	92.26	447.83	20.60%
2007/08	151.62	553.15	27.41%
2008/09	89.81	436.04	20.60%
2009/10	102.5	511.07	20.05%
2010/2011	67.86	434.56	15.62%
Average	100.81	476.53	20.85%

Source: Annual reports of BNL (2006/07 to 2010/11)

The above table 4.6 shows the proportion (%) of inventory with respect to its current assets. In FY 2006/07 it is 20.60% which is near to average for study period. And there is increased in the ratio in FY 2007/08 to 27.41% which is highest for that study period.

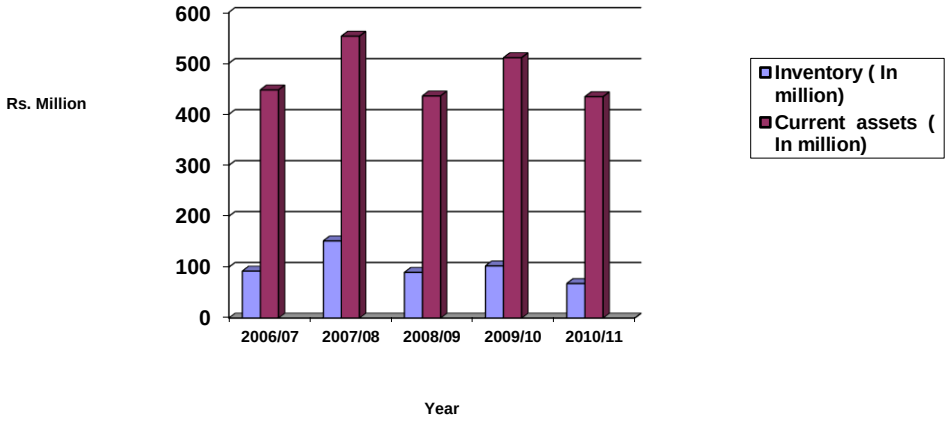
Similarly, average inventory in an overall study period is Rs. 100.81 million, average current assets in an overall study period is Rs. 476.53 million and average % of inventory on current assets in an overall study period has been 20.85%. The result shows that company has not been adopting an appropriate inventory policy because inventory level is not stable Note:

$$\%inventoryoncurrentassets = \frac{Total\ inventory}{Current\ \ Assets}$$

The graphical presentation of level of inventory and current assets is as follows:

Figure: 4.9

Level in Inventory and CA



4.2.6 Proportion of Raw Material on Total Inventory

Raw materials are the major component of total inventory so proportion of raw material on total inventory shows the clear inventory condition in an organization.

Table: 4.7

Proportion of Raw Materials on Total Inventory

Year	Raw Materials (Rs in million)	Total Inventory (Rs in million)	% of raw material on total inventory
2006/07	79.96	92.26	86.70%
2007/08	142.77	151.62	94.16%
2008/09	81.6	89.81	90.86%
2009/10	87.26	102.5	85.13%
2010/11	47.76	67.86	70.38%
Average	87.87	100.81	85.45%

Source: Annual reports of BNL (2006/07 to 2010/11)

Note: % of Raw Material on Inventory = $\frac{RM}{Inventory}$

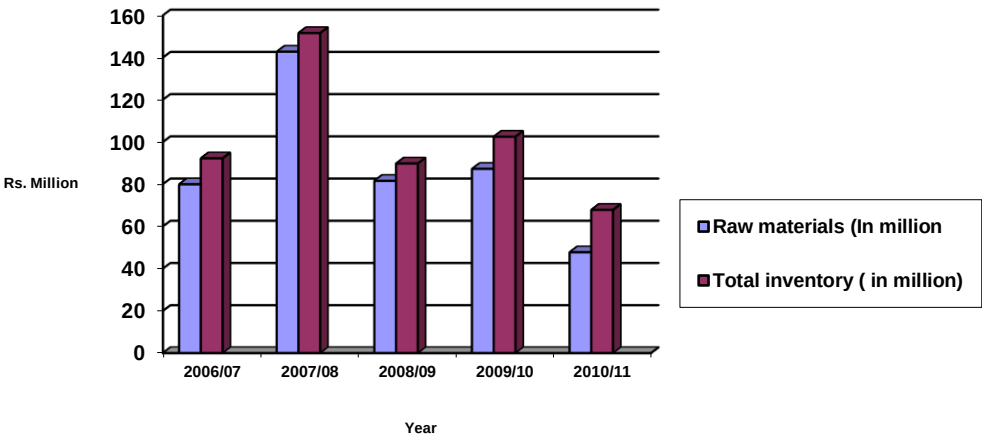
BNL has been using different types of chemicals: that constituting the major portion of raw material on total inventory in BNL. From the above table 4.7 it

observed that raw material on total inventory during the study period, the highest proportion is 94.16% in FY 2007/08 and the lowest proportion is 70.38% in FY 2010/11

Similarly, average inventor in overall study period is Rs. 100.81 million, .average inventory raw material in overall study period is Rs. 87.87 million and average % of RM in total inventory in overall study period is 85.45% The graphical presentation of raw material on total inventor)- is as follows:

Figure: 4.10

Level of Raw Material and Total Inventory



4.2.7 Proportion of work in Progress (WIP) Material on Total Inventory

The BNL has used the smaller proportion of WIP on total inventory which is shown by table 4.8.

Table: 4.8

Proportion of WIP Material on Total Inventory

Fiscal Year	WIP Material(Rsmillion)	Total inventory (Rs million)	% WIP on Total inventory
2006/07	1.58	92.26	1.71%
2007/08	1.38	151.62	0.91%
2008/09	1.07	89.81	1.91%
2009/10	0.86	102.50	0.84%
2010/11	1.22	67.86	1.80%
Average	1.22	100.81	1.43%

Source: Annual Reports of BNL (2006/07 to 2010/11)

$$\% \text{ WIP material on Total Inventory} = \frac{WIP\ Material}{\text{Total Inventory}}$$

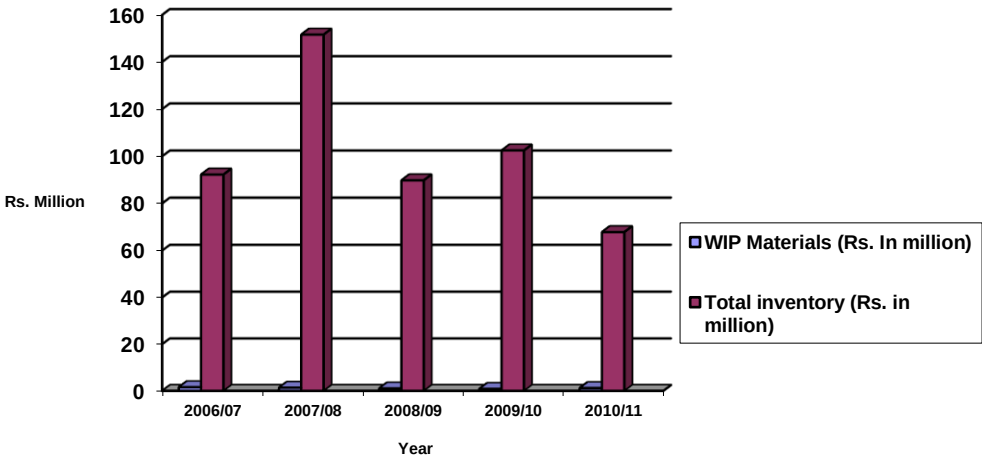
From the above table 4.8, it is observed that the proportion of WIP material on total inventory during the study period is 1.71% in the FY 2006/07, 0.91% in the FY 2007/08, 1.91% in the FY 2008/09, 0.84% in the FY 2009/10 and 1.80% in the FY 2010/11.

Whereas the average percentage of WIP material on total inventory in overall studies period is 1.43%. Similarly average inventory in overall study period is Rs. 100.81 million, average WIP material in overall study period is Rs. 1.22 million..

The graphic presentation of level of WIP material on total inventory is as follows:

Figure: 4.11

Level of WIP and Total Inventory



From the above analysis, it is observed that WIP material of the BNL is less fluctuating. Which is considered as good in the view point of inventor)- management.

4.2.8 Proportion of Finished Goods in Total Inventory

BNL has been producing different kinds of product namely. Coca Cola, Fanta, Sprite etc which is the part of finished goods stock.

Table: 4.9

Proportion of Finished goods on Total Inventory

Fiscal Year	Finished Good (Rs in million)	Total Inventory (Rs in million	% finished good on total inventory
2006/07	10.72	92.26	11.60%
2007/08	7.47	151.62	4.92%
2008/09	7.13	89.81	7.94%
2009/10	14.40	102.50	14.05%
2010/11	18.88	67.86	27.82%
Average	11.72	100.81	13.26%

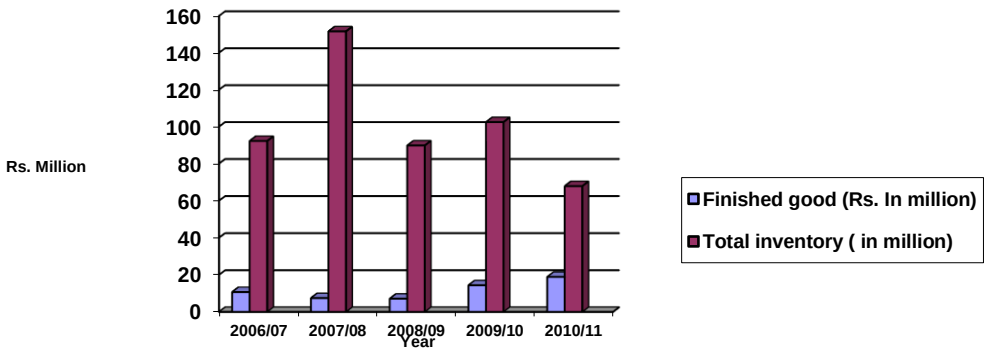
Source: Annual Report of BNL (2006/07 to 2010/11)

From the above table 4.9, it is observed that the proportion of finished goods on total inventory during the study period is 11.6% in the FY 2006/07, 4.92% in the FY 2007/08, 7.94 %in FY 2008/09, 14.05% in the 2009/10, and 27.82% in the FY 2010/11.

Whereas the average percentage of finished goods inventory in total inventory in overall study period is 13.26%. Similarly average inventory in overall study period is Rs. 100.81 million, average inventory of finished good is overall study period is Rs. 11.72 million. The graphical presentation of level of finished goods on total inventory is as follows:

Figure: 4.12

Level of F.G. and Total Inventory



4.2.9 Inventory Conversion Period

The inventory conversion period measures the length of time required to convert material into finished goods and then to sell those goods. It is the amount of time the product remains in inventory in various stages of production. The table 4.10 shows the inventory conversion period of BNL for the study period of 5 years 2006/07 - 2010/11)

Table: 4.10

Inventory Conversion Period of BNL

Year	Inventory (Rs in million)	Cost of goods sold (Rs in million)	Days in year	Inventory (day) conversion period
2006/07	92.26	358.38	360	93
2007/08	151.62	357.35	360	153
2008/09	89.81	351.08	360	92
2009/10	102.5	389.26	360	95
2010/11	67.86	455.13	360	54
Average	100.81	382.24	360	97.4
S.D	31.08	43.36	0	35.46
C.V.	30.83	11.34	0	36.40

Source: Annul Reports of BNL (2006/07 to 2010/11) and Appendix 4

The table 4.10 shows the inventory conversion period on days. The inventory conversion period of the company in FY 2006/07 to 93 days and it is increased in FY 2007/08 to 153 days. Then there is fluctuation in ICP. The average inventory conversion period for the study period is 97 days. It means that average length of time required correcting materials into finished goods and then to sells those goods required 97 days.

4.2.10 Payable Deferral Period

The payable deferral period shows the length of time between the purchase of raw material and labour and payment of cash for them. The following table 4.11

shows the payable deferral period during the study period. Here A/C Payable includes sundry creditors and other payable only.

Table: 4.11

Payable Deferral Period of BNL

Year	A/P (Rs. In million)	Cogs (Rs. in million)	Days in year	PDP (day)	Payment made per year (Times)
2006/07	14.20	358.38	360	14	25.71
2007/08	42.0	357.35	360	42	8.57
2008/09	52.67	351.08	360	54	6.67
2009/10	136.18	389.26	360	125	2.88
2010/11	95.5	455.13	360	75	4.8
Average	68.11	382.24		62	9.73

Source: Annual Reports of BNL (2006/07 to 2010/11) and Appendix No. 4

The table 4.11 gives the payable deferral period in days. In FY 2006/07 payable deferral period is 14 days which is lowest payable deferral period during the study period. In FY 2007/08 the PDP is increased to 42 days. And again in FY 2008/09 the PDP increased to 54 days. In FY 2009/10 the payable deferral period is 125 days, which is the highest PDP during the study period. From the fluctuated payable deferral period for the study period, it can be said that the company is not adopting the fixed policy to make payment for the labour and raw materials purchase. The average payable deferral period for the study period was 62 days and payment is made 9.73 times in year for purchase material and labour.

4.2.11 Inventory Turnover

Inventory turnover measures the activity or liquidity of firm's inventory. The company should maintain optimum level of inventory for the production and sales activity. A high inventory turnover is indication of good inventory management. A low inventory turnover implies excessive inventory levels than warranted by production and sales activities or slow moving or obsolete inventory

Table: 4.12

Inventory Turnover of BNL

Year	COGS (Rs in million)	Average inventory (Rs in million)	Inventory turnover (time)
2006/07	358.38	84.84	4.22
2007/08	357.35	121.94	2.93
2008/09	351.08	120.72	2.90
2009/10	389.26	96.16	4.04
2010/11	455.13	85.18	5.43
Average	382.24	101.77	3.90

Source: Annual Report of BNL (2006/07 to 2010/11)& Appendix 4

The table 4.12 shows the inventory turnover ratio of BNL for the study period. In FY 2006/07 the ratio is 4.22 times and decreased to 2.93 times for the FY 2007/08. Again in FY 2008/09 the ratio is decreased to 2.90 times but in FY 2009/010 and 20010/011 the ratio is continuously increased to 4.04 times and 5.43 times respectively. The ratio is recorded highest and lowest in FY 2010/11 and 2008/09 respectively. In average inventory turnover ratio is 101.77 times.

4.2.12 Trend Analysis

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

4.2.12.1 Trend Analysis of Purchase of Raw Material

Purchase is the process of acquiring something necessary to run the firm. Raw material is the fundamental and basic requirement for any processing industry to run it smoothly. Even through the five years data shown the declining trend in purchase of raw material, rise and fall in purchase was observed for given period.

Table: 4.13

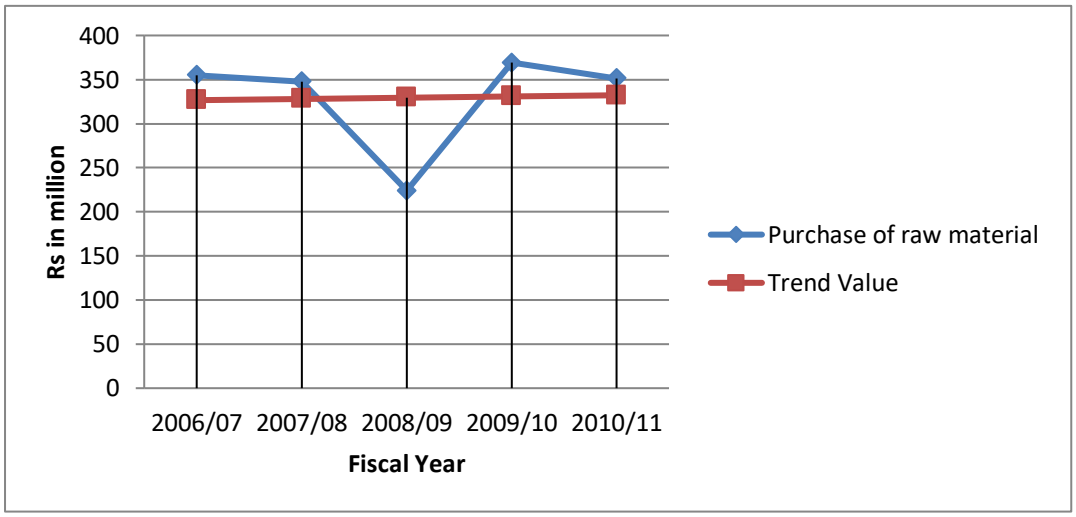
Trend Analysis of raw material purchase

Years	Purchase of raw material (Rs in Million)	Trend Value(Rs in Million)
2006/07	354.90	326.64
2007/08	347.87	328.05
2008/09	224.05	329.46
2009/10	369.28	330.87
2010/11	351.27	332.2

Source: Annual Report of BNL (2006/07 to 2010/11) & Appendix 6

Figure: 4.13

Trend analysis of Raw material Purchase



From the above table 4.13 and figure 4.13 shows that the trend value of raw material is continuously increased. But actual purchased are fluctuating for all study period. Except in FY 2008/09, the actual purchase is near to trend value but in FY 2008/09, the gap between trend value and actual purchase is very high. Finally the figure shows that the actual raw material purchase of BNL is higher than the trend value.

4.1.12.2 Trend Analysis of Sales

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

Table: 4.14

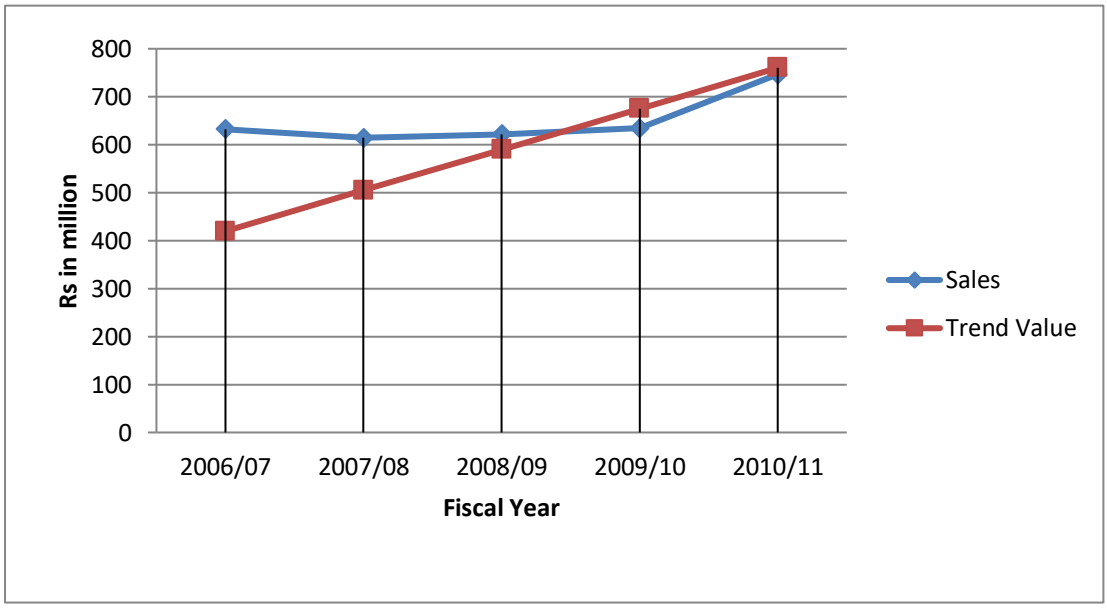
Trend Analysis of Sales

Fiscal Year (X)	Sales (Rs in Million)	Trend Value (Rs in Million)
2006/07	632.11	419.63
2007/08	614.47	504.76
2008/09	621.83	589.89
2009/10	634.19	675.02
2010/11	746.58	760.15

Source: Annual Report of BNL (2006/07 to 2010/11) & Appendix 6

Figure: 4.14

Trend analysis of sales



From the above table 4.14 and figure 4.14 sales are also increasing but not at steady rate during the study period. It has had increased from 632.11 for the year 2006/07 to 746.58 for the year 2010/11. However, the actual value lied up trend value

maximum all period of the study. In Fiscal Year 2008/09 and 2009/10, the actual sales was near to trend value but in FY 2006/07, the gap between actual sales and trend value is highest during the period. Finally the figures shows that the actual sales of BNL is almost equal to its trend value.

4.2.12.3 Trend Analysis of Inventory

Inventory is all the possession of industry. Inventory constitutes the important parts of current assets. Thus, the shortage of required inventory may result into regular production, high manufacturing cost, unfavourable labour variation. Therefore, the inventory must be in optimum position.

Table: 4.15

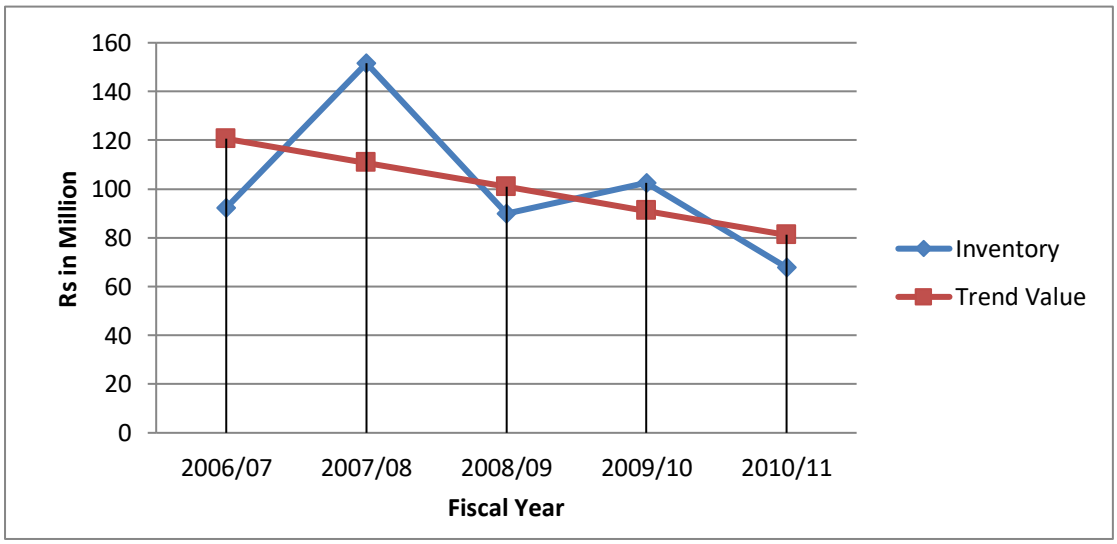
Trend Analysis of Inventory

Fiscal Year	Inventory (Rs in Million)	Trend Value (Rs in Million)
2006/07	92.26	120.59
2007/08	151.62	110.73
2008/09	89.81	100.87
2009/10	102.50	91.01
2010/11	67.86	81.15

Source: Annual Report of BNL (2006/07 to 2010/11) & Appendix 6

Figure: 4.15

Trend value of Inventory



The trend value of inventory of BNL has been decreased but the actual inventory as continuously fluctuating during the study period. Finally, we conclude that the trend value and actual inventory is gone for opposite direction during the period which is shown in table 4.15 and figure 4.15.

4.2.12.4 Trend Analysis of Raw Material Inventory

Raw materials in this case signifies the stock of raw materials in godown to meet the unforeseen future demand so that the industry will never faces how materials "shortage in the period of adverse natural and man made circumstances.

Table: 4.16

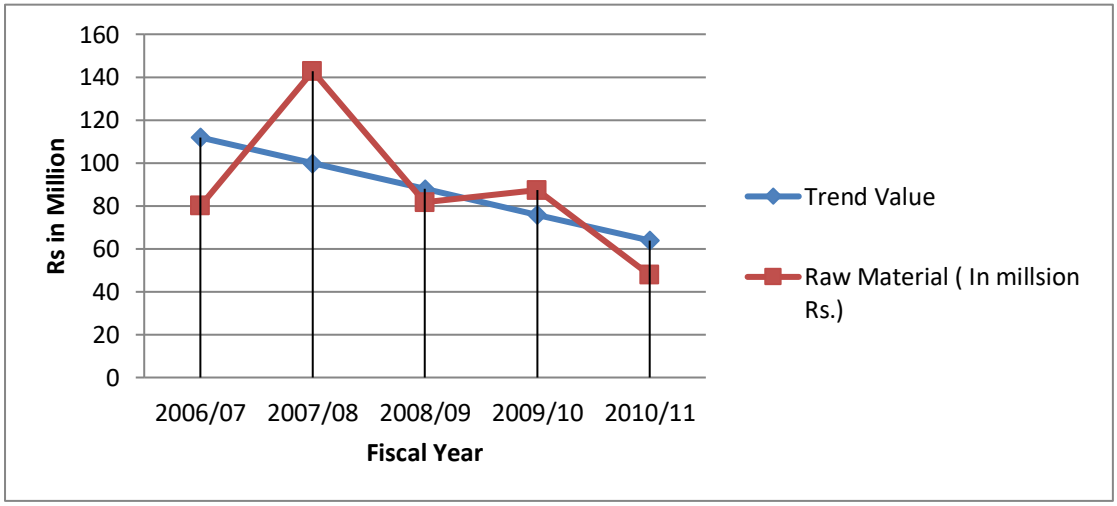
Trend Analysis of Raw' Material Inventory

Fiscal Year	Raw Material (Rs in Million)	Trend Value(Rs in Million)
2006/07	79.96	111.87
2007/08	142.77	99,87
2008/09	81.6	87,87
2009/10	87.26	75.87
2010/11	47.76	63,87

Source: Annual Report of BNL (2006/07 to 2010/11) & Appendix 6

Figure 4.16

Trend Analysis of Raw Material



Trend value of raw material is decreased through out the study period. But actual raw material was decreased as well as increased due to total inventory. In Fiscal Year 2007/08, the actual raw material is highest value of the study period. The highest gap between trend value and actual value is in FY 2007/08.

4.2.12.5 Trend Analysis of Work in Progress

Work- in-process simply constitute the product at various stages of processing before it became the finished goods. It serves as indicators for used for capital for company.

Table: 4.17

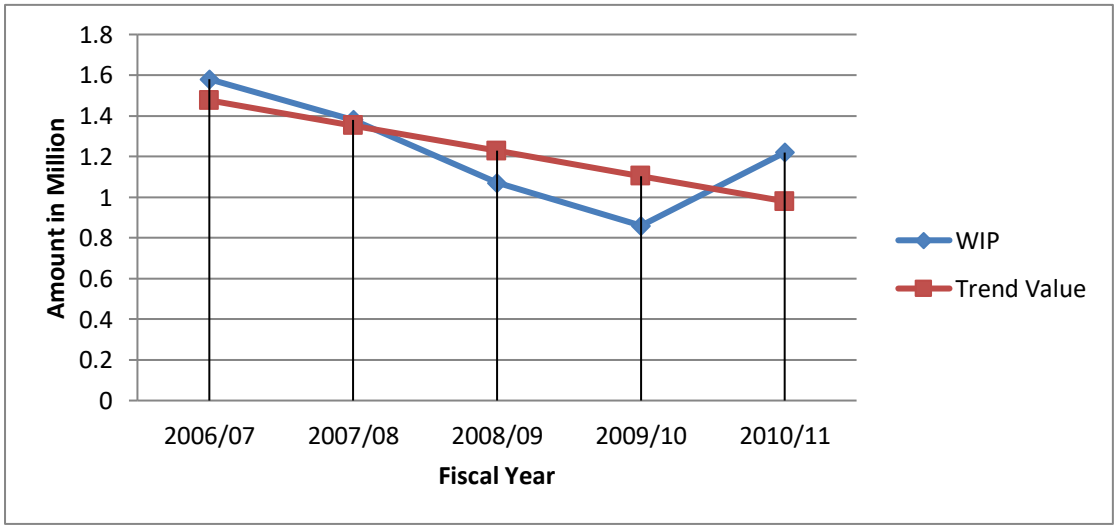
Trend Analysis of WIP

Fiscal Year (x)	WIP (Rs in Million)	Trend Value (Rs in Million)
2006/07	1.58	1.476
2007/08	1.38	1.352
2008/09	1.07	1.228
2009/10	0.86	1.104
2010/11	1.22	0.980

Source: Annual Report of BNL (2006-2011) & Appendix 6

Figure: 4.17

Trend Analysis of WIP



There is significant fall in work in process for the given period of 2006/07 to 2010/11. However fluctuation is observed during the period. The actual WIP is decreased in 2009/10 compare to 2008/09 and again increased slightly up in the year 2010/11. In 2006/07 WIP is in the highest recorded for this study period. The actual WIP is less compare with trend value table 4.17 and figure 4.17 given the picture of actual work in process and its trend value.

4.2.12.6 Trend Analysis of Finished Goods

Trend analysis of finished goods reflects the trend of production of the company. The trend analysis of finished goods of BNL is shown below through the table and figure.

Table: 4.18

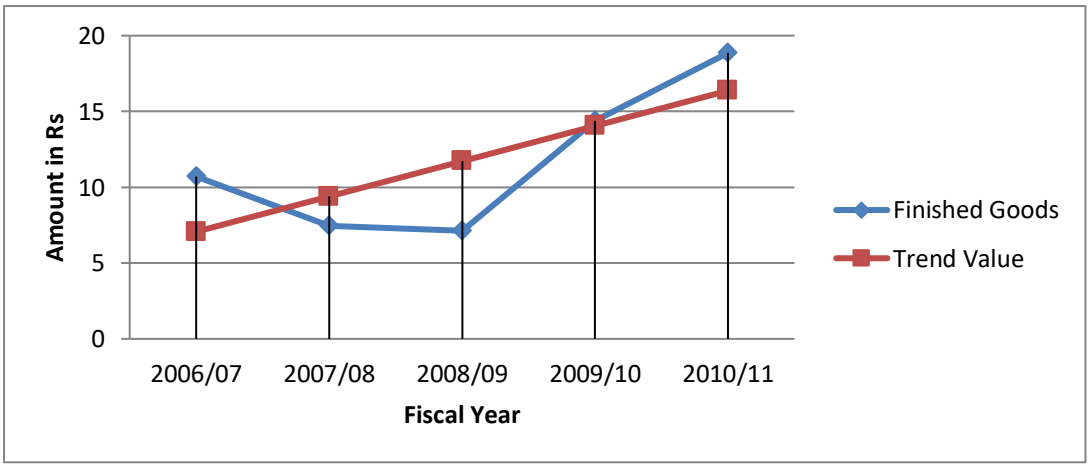
Trend Analysis of Finished Goods

Fiscal Year (x)	Finished Goods (in million)	Trend Value
2006/07	10.72	7.07
2007/08	7.46	9.39
2008/09	7.13	11.72
2009/10	14.40	14.05
2010/11	18.86	16.37

Source: Annual Report of BNL (2006/07 to 2010/11) & Appendix 6

Figure: 4.18

Trend Analysis of Finished Goods



From the above table and figure. In FY 2006/07, the finished goods is Rs. 10.72 million. But in FY 2010/11 it is increase to 18.86 million which is highest for the study period. So actual finished goods was more fluctuated during the period. But trend value is slightly increased. Finally, we conclude that actual finished goods are below the trend value in maximum period of study.

4.2.12.7 Trend Analysis of Cost of Good Sold (COGS)

Cost of good sold for the study period was founding fluctuated. In FY 2006/07, it is Rs 358.38 million and it is decreased to Rs 357.35 in FY 2007/08 and Rs 351.08 million in FY 2008/09 respectively. Then again increased and meet of Rs 389.26 in Fiscal Year 2008/09. Trend value is increased by 22.50 every year. The actual COGS are less compare to trend value.

Table: 4.19

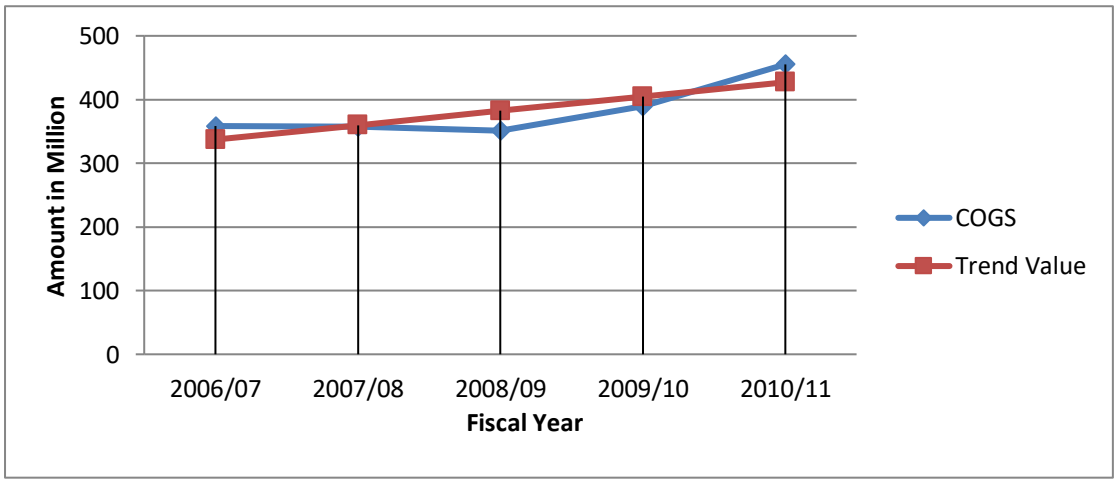
Trend Analysis of Cost of Good Sold

Fiscal Year	COGS (Rs in Million)	Trend Value (Rs in Million)
2006/07	358.38	337.12
2007/08	357.35	359.62
2008/09	351.08	382,12
2009/010	389.26	404.62
2010/11	455.13	427.12

Source: Annual Report of BNL (2006/07 to 2010/11) & Appendix 6

Figure: 4.19

Trend Analysis of Cost of Good Sold



4.2.12.8 Trend Analysis of Net Profit

Net profit is found declined from Rs. 37.80 millions during 2006/07 to Rs.34.73 millions for the year 2007/08. Trend value had also shown the continuously decreasing trend of net profit for the study period. That is the year 2009/10 during which there is vast difference in net profit compared to the previous year 2008/09 i.e. loss. Net profit is recorded the highest for the year 2006/07 (Table 4.20 and figure 4.20).

Table: 4.20

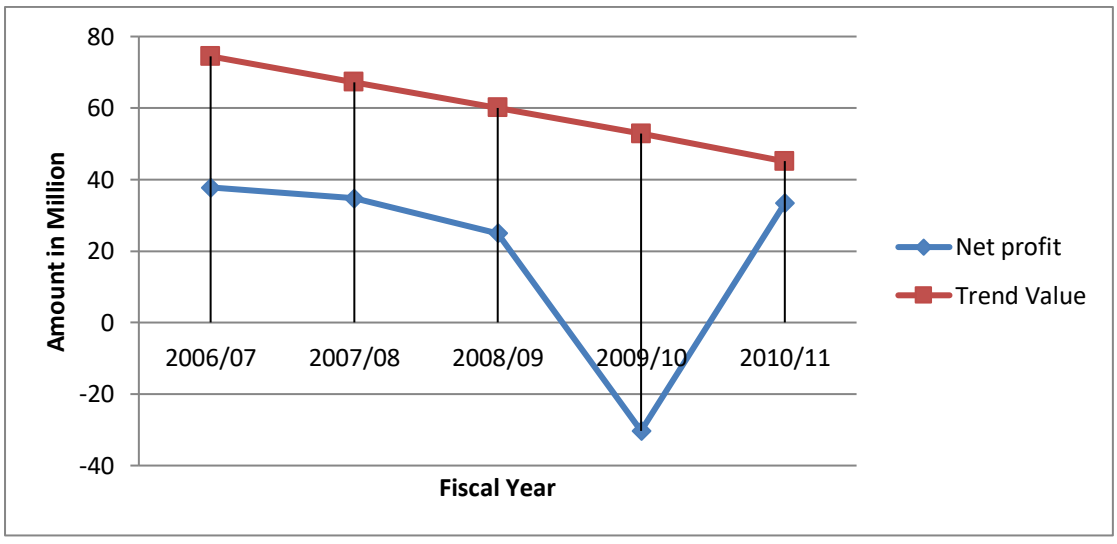
Trend analysis of net profit

Fiscal Year	Net profit (Rs in Million)	Trend Value (Rs in Million)
2006/07	37.80	74.46
2007/08	34.73	67.25
2008/09	24.96	60.03
2009/10	(30.30)	52.82
2010/11	33.42	45.08

Source: Annual Report of BNL (2006/07 to 2009/010) & Appendix 6

Figure: 4.20

Trend analysis of net profit



4.3 Major Findings of the Study

On the basis of the data presentation and their financial and statistical analysis of BNL, the major findings related to this study have been presented below.

1. In the company, there are different types of inventories, like RM, WIP, finished goods and stores and spare parts. Purchasing is the first step of inventory management of manufacturing companies. When all items of inventories are received by purchasing department they are passed into the store. So, these items are handled and managed carefully.
2. Store control device practice; In BNL the store control device adopted is Bin card, and store ledger. The company has not applied ABC analysis techniques to control various types of inventory in the store.
    - Bin Card: In context of BNL with its help the storekeeper can sent material requisition for the purchase of material in time.
    - Store ledger: The store ledger is systematically maintained by BNL. This ledger provides the information for the pricing of material issued and the money value at any time for each item maintained in store.
3. There are various problems like political crisis, strikes lockout and transportation problem facing by the manufacturing companies regarding the management of inventories.
4. The company has not been adopting appropriate inventory policy because inventory constitutes the higher proportion than that of other items of current assets. The company has not followed any type of inventory policies
5. Required raw materials for the production of different types of soft drinks are imported from the foreign countries like Iran, Pakistan, Indonesia, German and India.
6. In purchase procedure; purchase manager should maintain all the necessary records keeping in mind the most important objectives of the purchase department i.e. purchasing tight quantity and quality of material at the cheapest rate at proper time to help smooth running of the production function.
7. A good receiving process is a document on the basis of which purchases are verified and payment is made to the suppliers. It is also helpful in filling any

claim for short supplies. It provides a complete record of all materials received.

8. Issuing material: Material once received by the store is issued by the concerned department as per the quantity demanded in the requisition from previously provided to the store department.
9. There is not classification system of various types of costs so there is difficult to determine the ordering and carrying cost.
10. The company was not following scientific inventory management techniques i.e. economic order quantity (EOQ) model for purchasing different types of raw materials.
11. The higher value of standard deviation for actual sales indicates its inconsistent nature compared to closing stock. However, value of C.V. indicates that closing stock fluctuates more than actual sales. The value of correlation coefficient 0.8 means the positive relationship between these two variables i.e. increasing in closing stock result into increasing in actual sale and vice versa.
12. Higher value of standard deviation for closing stock compare to actual purchase indicates that closing stock fluctuates more than the actual purchase. However value of C.V. indicates that actual purchase is relatively stable compared to closing stock. The value of correlation coefficient 0.28 means the positive relationship between these two variables. This means the movement of both variables is in the same direction.
13. In an average actual purchase is less than the actual sales. Value of both S.D. and C.V. signifies the consistent nature of actual sales compared to actual purchase.
14. Average proportion of inventory to current assets of BNL was only 20.85% for the study period. The result shows that the company has not been adopting an appropriate inventory policy because inventory level is not stable.
15. Average proportion of raw material in total inventory in overall study period is 85.45%. From this study it is observed that raw material consumption in the company is more fluctuating due to the defective purchasing policy and poor planning of raw material.
16. Average proportion of WIP in total inventory in overall study period is 1.43%. It is observed that WIP material of the BNL is less fluctuating.

17. It is observed that the finished goods stock is slightly fluctuating. The main reason for fluctuation is the fluctuation of demand and sales of the company.
18. Inventory conversion period: In BNL the average length of time require to convert material into finished goods and then to sell these goods required 97 days.
19. Payable deferral period: In BNL payable deferral period for the study period was 86 days and payment is made 9.73 times in a year for purchase and labour in average.
20. Inventory turnover: Inventory turnover ratio is an indicator of the efficiency of management. The inventory turnover for the study period was fluctuating with the average of 3.9 times. The highest ratio signifying the most efficient inventory management is recorded in 2008/09 and the lowest signifying the worst inventory management situation was recorded in 2006/07 within the study period
21. Proportion of inventory to current assets: In an average 20.85% of total current assets is covered by the inventory. Bit the ratio are slightly fluctuating over the study period.
22. Trend Analysis;

CHAPTER - V

SUMMARY, CONCLUSION AND RECOMMENDATION

Inventory is one of the most important assets to any organization. The detail about inventory management and introduction of the study have been already been presented in first chapter. The second chapter includes the available literature on inventory management, whereas, the research methodology of the study is describe in the third chapter. All the available data relating to inventory decision sorted out by issues of inventory management of Bottlers Nepal Limited are presented, analyzed and the major finding if the study has been also presented in the chapter four.

In this concluding chapter the summary of this study, recommendations on the basis of the major findings, which are derived from the analysis of financial statement of BNL and conclusion are presented.

5.1 Summary

Bottlers Nepal Limited is the leading multinational company among the manufacturing and processing company, *which* was established in 1987. BNL supply the quality product at right time in a reasonable price. To earn profit it is necessary to run the company efficiently, economically as well as profitably. To ensure this situation in BNL the efficient management of inventory takes vital role. So this study is concerned with in what extent the company is applying the inventory management techniques to minimize the cost of inventory, which directly affect the price of product.

Most of manufacturing company and trading company invest a huge amount of money in the form of inventor}'. BNL also being the manufacturing company invests huge amount of capital in form of inventory, and cost of carrying inventory is higher out of total inventory cost. The cost of inventor}' directly affects the cost of production and profitability of company. If means slight reduction in cost of inventory, decreases the production cost and ultimately increases the profitability at remarkable rate. For this, the efficient management of inventory is desirable.

This study is based on the inventory management of BNL. It is done with a view to solve the problem arises on achieving the objectives of the BNL. Here the main objective of the study is to analyze the inventory practices and to analyze the inventory management system followed by BNL. To make this study, the related literatures have been reviewed. Review of literature gives the concept of inventory management and frameworks from various books journal and articles.

The basic objective of the study is to examine the management of inventory in BNL. To fulfill the objective as described, appropriate research methodology has developed. It consists the research design, population and sample, nature and sources of data, data gathering procedures, data period covered and method of analysis. In border to carryout the study data have been basically collected from secondary sources such as annual report, official report and financial statement provided by BNL. The primary data is also collected from with direct interviews with concerned staffs of the company to find out the problem of company and then the collected data are tabulated and presented as the states methodology. Then the analysis has been made using the descriptive analysis of inventory management and others analytical tools. This study covers only five years of financial data i.e. from 2003/04 to 2007/08. It also used the various inventory tools and statistical tools to analyze the available data.

Descriptive analysis consists of the purchase procedure practice in BNL, store control device practice and issuing materials. In case of inventory management analysis is done by the analysis of AR and AP. The company has poor estimation of AR. So the company should make the purchase budget. The company does not purchase the raw" material based on the economic order quantity. So if the company wants to minimize the inventory cost the company should use EOQ model

The relationship between sales and closing stock, purchase and closing stock has sales and purchase has positive relationship. The average value of inventory in relation to current assets is very lower therefore the BNL does not maintain the adequate level of inventory to fulfill the demand. The average conversion period is 97 days and it is more fluctuated so the company has not fixed policy. In average inventory turnover ratio is very low. It indicates the worst inventory management system. The average payable deferral period is 62 days. It is more fluctuated which

can be said that the company does not adopting the fixed policy to make payment for the labour and raw material.

To find out the future trend, the trend analysis of purchase of raw material, sales, inventory, raw material, WIP, finished goods, cost of good sola has been done. The trend analysis of inventory, raw material, WIP, net profit variables are downward slope and other are upward.

5.2 Conclusion

The growing number of corporation in Nepal is facing problems of inventory. Due to lack of proper inventory policies, there are many corporations where large amount of capital has been blocked up and very little measures have been taken to manage the inventories on the basis of inventory decision models and techniques that have so far developed. The main objective of this study is to analyze the inventory management practices of BNL and problem faced by the BNL in the management of inventory. For the purpose of the study the data and the necessary information were collected from the records and annual reports provided by the company.

BNL has applied only bin cards and store ledger as the inventory control techniques but not applied the ABC analysis. The company does not classify the inventory cost into carrying and ordering cost. The company does not follow the economic order size purchase so the total cost of carrying and ordering the inventory is higher. By the analysis, the average inventory conversion period BNL is 97 days but the payable deferral period is 62 days. The average inventory turnover ratio is 3.9 times. Which maintain higher level of inventory as compared to total cost of goods sold. The average trend values of inventory, RM, WIP, net profit are decreased.

By the overall analysis it can be concluded that BNL should classify the costs & maintain the economic order size, which helps to minimize the inventory cost and to increase the profit of the company.

5.3 Recommendations

Analyzing the available data, some findings were extracted. Based on the major findings it may be appropriate to make some suggestions and recommendation for proper management of inventory in BNL. Some of the recommendations based on the major findings are as follows:

1. **Coordination among different department**: Purchase plan should be prepared for different types of raw materials with the proper co-operation and co- ordination among the planning, purchasing, storing, production, marketing and sales department to avoid the excessive investment on inventory.
2. **Minimize the inventory cost:** The popular scientific inventory management techniques like (EOQ) should be applied by the company for purchasing different types of raw materials so as maintain optimum level of inventory and minimize the total inventory cost i.e. carrying cast and ordering cost.
3. **ABC analysis**: The company should apply the selective inventory model (ABC analysis) to control the inventories in the store. ABC analysis divides the inventory into three group i.e. A, B and C according to their usage value which helps to apply proper degree of control for different groups of inventory and minimize the investment on inventory and cost of storage.
4. **Optimal order size**: In BNL, average actual order size surpasses the average economic order size consequence of which is the greater average actual inventory cost there by reducing the efficiency of the company. Therefore effective steps must be taken to minimize this gap so that the company should run in most efficient way.
5. **Adequate investment in inventories**: Lower investment on inventories in relation to current assets may create immediate crisis in the side of production in short duration unfavorable circumstances. Therefore it is necessary to maintain the adequate level of investment on inventories.
6. **Purchase budget:** The company should make purchase budget because the entire departments need to fulfill their need as per the budget allocated. This should be made on the basis of past experience.
7. **To increase the profit**: In context of BNL, to increase the profit of the company, the company should make the operating and inventory management

cost minimized with the use of optimal EOQ, which in the case of the company is higher.

8. **Investment in inventories in relation to total assets:** Average Investment in inventories in relation to total assets was only 17.58% in the case of BNL for the study period. From this, it can be concluded that in an average there is lower value of inventory in relation to total assets therefore the BNL does not maintain the adequate level of inventory to fulfill the demand.
9. **Inventory conversion period**: In the context of BNL there is no fixed policy of inventory conversion period so it is fluctuating that's why company should make plan to maintain the fixed inventory conversion period.
10. **Inventory turnover ratio**: The average inventory turnover ratio is 3,9 times. It seems that the company maintained higher level of inventory as compared to the total cost of good sold. so the company has to maintain the adequate level of inventory to meet the demand. So the company should make the optimum inventory management policy, the higher inventory level makes the higher costs of inventory so it is necessary to make the optimum inventory management plan.
11. **Effective management**: It is essential to give regular training on inventory management. For the changing environment the training and seminars play a vital role to develop the employee's efficiency. Consequently managerial forecasting ability of the concerned staffs will be enhanced.

BIBLIOGRAPHY

Acharya, (2010) *"Inventory Management of Nepal Food Corporation"* Unpublished Thesis Shanker Dev Campus, Kathmandu.

Ahuja, K.K.(1993), *Production Management,* CBS Publisher and Distributions, New Delhi.

Balika, R. K.(2007), *Inventory Management; A case study of Hetauda Cement Factory Limited.* Unpublished Thesis T.U. Kirtipur.

BanjadeJ.J. *Production Management Procurement: the first step in material Management,* Kathmandu

Barcodesinc. (2012) "Google search, www.barcodesinc.com/articels"

B.K, Man Bahadur, (1994) *Financial Management,* B.K publishing

Bose De. L. J. *Production Management,* Prentice Hall of India Pvt. Ltd. New Delhi

Charles Dominick. (2012) "Wikipedia.org/wiki/inventory_management" z

Cope W.J.F,. and E. Thomas.(1982), *Managerial Finance.* The Dryden press, India. Elwoods, *Modern Production Operation,* New Work.

Goel, B.S. (1992), *Production of Operation Management,* Pragati Prakashan India.

Goel, M.M. and B. S.(1992), *Production of Operation Management,* Pragati Prakashan India

Goyal, M.M. and S.N. (1993), *Principal of Management Accounting,* Shatya Bhawan, Agra.

Hampton. J.J.(1930), *Financial Decision Making,* Prentice Hall India Pvt. **Ltd.**

Jain, S.P. and Narang K.L.(1991), *Cost Accounting,* Kalyani Publishers, New Delhi.

Jain, S.P. and Narang, K.L.(1994), *Advanced Accounting,* Kalyani Publishers, New Delhi.

Kandel Bal Dip, (2004) *A study on Inventory Management of Royal Drugs Ltd*, Tu unpublished thesis

Khan M.Y. and Jain P.K.(1992), *Financial Management*, Tata McGrawHill Publishing Co. Ltd. New Delhi.

Khanal Pitambar, (2005) *"Inventory Management System of Gorkhapatra Corporation"* unpublished thesis shanker dev.kathmandu

Kothari, C.R. (1998), *Research Methodology, Methods and Analysis*, Hilly Eastern Ltd. New Delhi.

Kshetry, R.B.(2002), *Inventory Management* : A case study of AIC with Special Reference to chemical Fertilizer in Kathmandu Valley.

Lamichhane Surendra, (2005) *"Inventory Management of Nepal Lever Ltd"* Tu unpublished thesis

Lohani, S. The AIC of Nepal*: A Case Study in Organization and management and its impact o n agriculture*

Maynard, H.B. *Hand Book of Business Administration*.

Ojha. K.P. (1995), *Profit Planning and Control of public manufacturing company in Nepal with comparative study of RDL and HPPC*.

Pandey, I. M.(1994), *Financial Management*, Vikas Publishing House Indian.

Pathak, J.R.(1982),. *Management Dynamics (two).*

Paudel Kalpana. (2005) *The Predictive Power of the Ratios of Nepalese Manufacturing PEs*

Pradhan, S. (1992), *Financial Management Education Enterprises* (First Edition), Kathmandu.

Pradhan Radheshyam. (2003) *Prediction of Financial Distress in Nepal:* A Consensus Approach

Richardmond, J.H.(1969*), Effective Inventory Management*. Prentice Hall of India.

Sharma, V. *Inventory Management: A case study of cereal seed supply of AIC,* Rupandehi.

Shrestha, K.N. and Manandhar, K.D.(2057), *Production and Operation Management, Valley Publishers Kathmandu.*

Shrestha, M.K.(1980), Financial Management: Theory and Practice, T.U. Kathmandu.

Sigdel, S.(2002), *Inventory Management:* A case study of AIC.

Soleman Ezra, (1981), *The Theory of Financial Management,* New York.

Starr M.K. and D.W. (1962), Miller, *Inventory Control Theory and Practice Engle Wood (Liffs N.)* Prentice Hall.

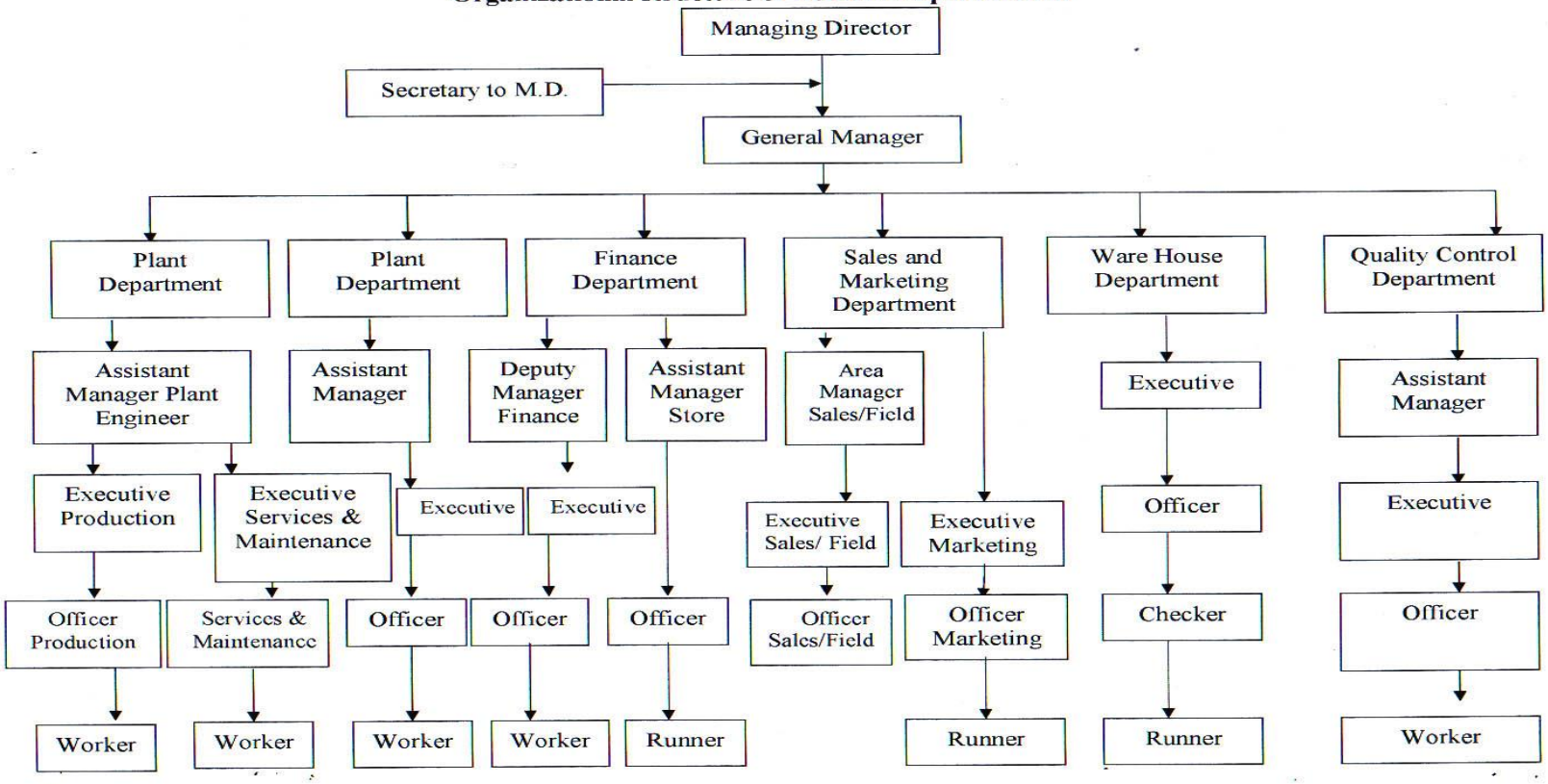
Vanhome, J.C.(1990), *Financial Management and Policy,* Prentice Hall of India Pvt. Ltd. New Delhi.

Welsh, G.A. R.W.(19914), Hilton, and P.N. Gardon. *Budgeting, Profit planning and Controlling.* Prentice Hall of India Pvt. Lid. New Delhi.

Wolf Howard k. and Pant, Prem R. *Social Science Research and Technical Writing,* Sewa Printing Press, Kathmandu.

Appendix 1

Organizational structure of Bottlers Nepal Limited



Appendix 2

Bin Cards of BNL

Bottlers Nepal Limited

Balaju , Kathmandu

Code …… Mate:

BIN CARD folio no ….

Description:

Location : ……..

Date	Reference	Receipt	Issued	Balance	Signature

Minimum Level : ……. Re-order level …….. Re-order Qty …..

Appendix 3

Store Ledger of BNL

Bottlers Nepal Limited

Balaju, Kathmandu

Purchasing consumption during the period of 20 ….. to 20 ….

Store Ledger

Date ref. No.	MRN	Received			Issued			Closing balance		
	GRN	Qty.	Rate	Amt.	Qty.	Rate	Amt.	Qty.	Rate	Amt.
Opening balance										
Adjustment										

Appendix 4

Compiled data of BNL related to inventory

Rs in million

Particular	Year					Average	S.D.	C.V
	2006/07	2007/08	2008/09	2009/10	2010/11			
Sales	632.11	614.74	621.83	634.20	746.58	649.89	48.86	7.51%
Cogs	358.38	357.35	351.08	389.26	455.13	382.24		
Purchase of Raw Materials	155.92	176.42	118.17	172.97	152.88	155.27	53.21	16.15%
Total inventory	92.26	151.62	89.81	102.5	67.86	100.81	27.80	27.57%
Raw materials	79.95	142.78	81.60	87.26	47.76	87.87		
WIP	1.58	1.38	1.07	0.86	1.22	1.22		
Finished goods	10.72	7.46	7.13	14.40	18.86	11.72		
Net profit	37.80	34.73	24.96	(30.30)	33.41	20.12		
Current assets	447.83	553.15	436.04	511.06	434.60	476.53		
Total assets	886.66	975.27	1048.35	1255.77	1190.16	1071.24		
Account payable	14.20	42.0	52.67	136.18	95.5	68.11		
ICP (days)	93	153	92	95	54	97.4	31.71	32.56%
PDP (days)	14	42	54	125	75	62		
ITR (times)	4.22	2.93	2.90	4.04	5.43	3.90		

Appendix 5

Relationship between the different Variables

Particulars	Correlation Coefficient	Probable Error
Between Sales & Closing stock	0.80	0.10
Between material Purchase & Closing stock	0.28	0.28
Between sales & Purchase	0.80	0.10

Appendix 6

Trend Value

Particular	2006/07	2007/08	2008/09	2009/10	2010/11
Sales	419.63	504.76	589.89	675.02	760.15
Material Purchase	326.64	328.05	329.46	330.87	332.20
Total Inventory	120.59	110.13	100.87	91.01	81.15
Raw material	111.87	99.87	87.87	75.87	63.87
WIP	1.476	1.352	1.228	1.104	0.980
Finished Goods	7.07	9.39	11.72	14.05	16.37
COGS	337.12	359.62	382.12	404.62	427.12
Net Profit	74.46	67.25	60.03	52.82	45.08