

CHAPTER – I

INTRODUCTION

1.1 Background of the Study:

Nepal is a medium sized and land locked country. It is rich in many more natural resources but they are not properly utilized till now. Nepal is a least developed and least industrialized country. As a result, the country faces various problems. Nepal has adopted mixed economy, since several years with the adaptation of mixed economy; Nepal has established several public enterprises with an aim of rapid economic development and social welfare.

Public enterprises are major entities in Nepalese economy. The history of public enterprises begins after the establishment of Biratnagar jute mill in 1994 B.S. before the democracy prevailed in 2007; there were limited public enterprises in existence. During different development plans period, different types of public enterprises were established by government of Nepal with different objectives like utilization of the natural resources, saving foreign exchange, generating employment opportunities to accelerate the rate of economic growth, and established of welfare of the society, that will also increase the government revenue and contribute significantly in the national development as well as in country's economic development.

In Nepal Public Enterprises have been established in various sectors. They have been established as manufacturing, social service, public utility, trade and financial sectors. Generally, PEs are owned and managed by the government, 51 percent or more shares should government owned to make entity public enterprises. According Friedman, "Public enterprises is an institution operating a services of an economic and social character on behalf of the government, but as an independent legal, largely autonomous in its management, through responsible to the public through government and parliament and subject to some direction, by the government equipped on the other hand with independent and separate funds of its own and the legal and commercial attributer of a commercial enterprises". From the above meaning and definitions about the public enterprises can be characterized by the following points, namely

- ❖ Government ownership
- ❖ Autonomous in management
- ❖ Legally freedom
- ❖ Government has right to control and give direction to the management
- ❖ Accountability towards the people
- ❖ Benevolent management
- ❖ Financed by the government
- ❖ Large scale of activities
- ❖ Service motives

The main aim of this study is to analyze the existing inventory management system followed by Gorkhapatra Corporation. GPC had established as a social sector public enterprises in 2020 B.S under the special act i.e. Gorkhapatra corporation act 2019. The man objective of the corporation at the time of establishment was to publish magazines but nowadays this corporation is working in the field of publishing News paper and other varieties of magazines such as “Yuba Munch” “Madhupark”, “Muna” etc. And this corporation is affiliated to the Ministry of Information and Communication.

Inventory is the main part of investment in any organization either they are manufacturing or non-manufacturing. Inventory refers to the goods and or materials used by a firm for production and sales. It also includes the items which are used as supportive materials to facilitate production. Inventory also categorized into three types i.e. raw material, work-in-process and finished goods. According to dictionary of accountancy “Inventory is a tangible property held for sale or materials used in a production process to make a product.” In this sense inventory is so important to meet the organizations objective. Inventory management plays a vital role in any organization. Any organization would like to keep some stock of goods as the cushion for uncertain sales for of tomorrow. Normally the size of the organization, (i.e. small, medium and large) has great impact on the inventory level and also depends upon the size of transaction and nature of the product. According to Goel Inventory enlists the names, quantities and monetary value of all or any group of items. Modern concept of inventory

management has been developed by several authors namely RC Davis, H.S. Owen, E.F. Clark and R.N. Wilson during the year 1915 to 1922 A.D. During this period, they developed economic of size equation which helps to minimized the sum of total carrying cost and total ordering cost, where the demand of the should be known and supposed to the remain constant. Therefore, Inventory management takes the important role because the cost of inventory directly affects the profitability of the firm or business organization. So the firms must have to keep the optimal level of inventory at right time because keeping higher level of inventory incurred high cost in storage and holding lower level of inventory may stop the production process. Hence, inventory management plays an important role in the field of any enterprises.

1.2 Introduction about Gorkhapatra Corporation:

1.2.1 Historical Background of the Gorkhapatra Corporation

Gorkhapatra Corporation was only one government organization in Nepal which was established in Rana Regime in time of Rana Prime Minister Dev Shamsheer Rana. In the beginning of the establishment, it published the Gazette of government but later in 1850, Rana Prime Minister Junga Bahadur Rana brought publication instrument i.e. Giddhe Press from England and the corporate publication of news paper and Gazette was started to publish in Nepal.

In the earlier period of its establishment, it published weekly newspaper from 24th Baishak, 1958 B.S. It published twice a week from 29th Ashadh, 2002 B.S., thrice a week from 8th Paush, 2003 B.S. and later from 7th Falgun, 2017 B.S., it began to publish as a daily newspaper.

Gorkhapatra Corporation published the daily newspaper called “Gorkhapatra” in Nepali and “The Rising Nepal” in English medium which contains different national and international news. This publishing institution was introduced as “Gorkhapatra” for 64 years since its establishment time but later this institution turned into a corporation under the “Gorkhapatra Sansthan Act 2019.” In 25th Ashadh, 2020 B.S., this corporation was introduced as a public corporation.

1.2.2 Publication of Newspaper and Magazines by Gorkhapatra Corporation:

The “Gorkhapatra” in Nepali, other publications of this corporation are as follows:

- ❖ The Rising Nepal (English newspaper daily in 1st Paush 2022)
- ❖ Mudhpark (Monthly magazine in Jestha, 2025)
- ❖ Sunday Dispatch (English newspaper weekly in 9th Baishak,2047)
- ❖ Muna (Monthly children’s magazine in Paush ,2047)
- ❖ Apsara (Monthly magazine in Baishak, 2055)

Gorkhapatra Corporation has been providing continuous contribution through the various ways to the nation according to its motto.

1.3 Significance of the Study:

Managing optimal inventories is a crucial job for the public enterprises or other business organization. Inventories include cost (i.e. ordering and carrying cost) if the enterprises holding more inventories it means incurred more cost where as if the enterprises holding low inventories, it is difficult to run the daily business activities. Therefore, holding more or less inventories is not good for the organization because, it ultimately reduces profitability of the organization. So, effective handling of inventory helps the organization reduce the total inventory cost. The study of inventory management of Gorkhapatra Corporation might be helpful for the new researchers as well as Gorkhapatra Corporation itself to improve its performance. The significance of this study can be summarized as follows:

- ❖ This study will be useful to manage the effective inventory management policy of Gorkhapatra Corporation.(GPC)
- ❖ This study will be helpful for the management to control the unnecessary expenses of the corporation.
- ❖ This study is only focus on the inventory management so it is importance to control the inventory of GPC.
- ❖ This study shows the actual doing and result of current inventory management system of GPC.
- ❖ This research work might be useful for related field for the new researches.

1.4 Statement of the Problem:

Inventory is the main key factors of the process of production in an organization, without inventory the organizations cannot establish their identity in the market. So, keeping right or optimal level of inventory helps to service and growth of the organization for the long time period. Therefore, the organization has to investment in the inventories should be sufficient at the optimal level. Excessive investment in inventory definitely increase the carrying cost as well as storage cost for them where as inadequate inventory increase the ordering cost and may interrupts in the functions of production process, which leads to fail to meet the market demand of the consumer. When we talk about the management of foreign countries like Japan, Korea, America etc they followed different inventories policies.

In Nepal, many Public Enterprises are established by the government sectors where still most of these enterprises are not given the proper attention in the management of inventory level. So, the improper management in the inventory level cannot maximize the profit of the firm as well as difficult to survival for long period. The main problems in the management of inventory in Nepalese enterprises are that they are not using the scientific method of handling of inventory level and the useful tools of handling inventory in and enterprise cannot adopted, instead of those things they are moving or using the old own trend of managing the inventory which is not effective for the smooth operation of the enterprises and cannot earn huge amount of profit for the firm.

On the basis of above mentioned activities the following particulars research questions are tried to be answered in this study:

- i) Whether or not GPC has followed systematic and scientific inventory management system.
- ii) How much EOQ should be?
- iii) Demand and supply of the newspaper and magazines.
- iv) How the inventory cost can be reduced (carrying and ordering cost)?

1.5 Objective of the study:

The major objectives of this study are to identify the inventory system of GPC. The specific objectives of this study are as follows:

- ❖ To examine present existing position of inventory management in GPC.
- ❖ To determine the optimal inventory level of raw material in GPC.
- ❖ To provide the useful suggestion and recommendations regarding effective management of inventories on the basis of the study and findings.

1.6 Need of the study:

Inventory is the main part of every organization to produce necessary product. So, the organization should manage the inventory at optimal level. This is the subject matter of production manager nowadays in every organization. The goal of the organization can only achieve if the organization can manage the inventories in effective and efficient way. Therefore, study on inventory management is great important. “Inventory is the most important thing but large inventory is the evil for the organization.

The organization having both excessive and inadequate inventories is not desirable for the growth and survival. The reason is that excessive inventories increases the carrying cost and also increases the investment cost on inventories. On the other hand inadequate inventories may disturb in the smooth production process and also in efficient to meet the market demand of the customers where these position is not favorable for organization. So it is better to understand by the organization to keep right quantity in inventories in desirable for production. To improve this situation, the effective management of inventory system plays a vital role to the Gorkhapatra Corporation. Therefore, it is interested to know about the utilization of inventories to fulfill the objective of Gorkhapatra Corporation.

1.7 Limitation of the Study:

Everything will have to be confined into a certain boundaries. In the same way, this study also falls in the same characteristic and has the following limitation caused by time as well as financial constraints. They are presented below:

- i) This study will only focus the inventory management of GPC but it does not concern about the other corporation of inventory management.
- ii) This study includes past 5 years data to analysis and interpretation of existing inventory management system of GPC will be mainly.
- iii) The research study will be mainly based on secondary data.
- iv) The conclusion drawn from this study does not ensure wide applicable in all type of Public Enterprises.

1.8 Organization of the Study:

The whole study is divided into five different chapters which can be presented as below:

Introduction:

In this section, we are presented a background of the study, historical background of the GPC, significance of the study, statement of the problem, objectives of the study, need of the study and limitation of the study.

Review of literature:

In this section, we are reviewed different journals, books, published reports, articles and previous thesis relating to the inventories management policy.

Research Methodology:

This section deals with various descriptions of tools and techniques for data collection, presentation and analysis of the study.

Data presentation and Analysis:

In this section, collected data are tabulated and analyzed by the different statistical tools, graphs and diagrams.

Summary, Conclusion and Recommendation:

This section deals with summary, conclusion and recommendation on the basis of study. An extensive bibliography and appendices are also attached at the end of the study.

Chapter – II

REVIEW OF LITERATURE

This theoretical portion helps to conduct the research work. Here different types of principals can be used to develop the theoretical framework of inventory management system. Also, we collect various ideas and formulas from different published as well as unpublished literatures to conduct the study. Inventory management is the one of the important component of the every manufacturing enterprises of Nepalese business organization.

Only few numbers of studies has been conducted in the field of inventory management. Generally, we divided this chapter into two sub-sections i.e. namely theoretical concept of inventory is shown in the initial phase and review of related studies in the second phase.

2.1 Theoretical Framework:

In simple meaning, inventory can be defined as a stock which is ready to convert into finished product / goods. But in broad sense, inventories are stock of raw material, work-in-process, finished goods and office supplies. They are equally important for small or large business organization. As we know that, for manufacturing enterprise, inventory is the most important factors for production process. Without inventory, the manufacture enterprises can not be established. So every manufacturing enterprise must think about the different types of inventory used in their firm daily.

Inventory management means the management of optimal level of inventory in a firm. To maintain the optimal level of inventory in a firm, it is necessary to train the employees by the top level management or by hiring the expert person from outsides, because inventory includes the maximum amount in the production process to produce the product. Inventory involves different forms such as financial dimension and physical dimension. These dimensions are interrelated and cannot be separate while analyzing the inventories in a firm.

There are various forms of inventory can be keep such as raw material, semi finished goods as well as finished goods which play a significant role in the success of every enterprises.

According to the Weston and Brigham, 1992, “However firms would prefer to hold little or no inventory and if it called be arranged, firms would like to time the production of their products to coincide perfectly with the arrival of demand”.

As we know that, demand of the product in the market for the future time cannot be predicted at present by the firm. If the firm can estimate or forecasted the demand of the product, at present situation, at such condition, the firm may try to coincide its production of products/goods with the demand of its customers. So such type of function may take only few amount of time for production and it changes with the length of transportation process and value added to the original material purchased. But in reality such action may not take easily. So that, the company try to maintain optimal inventory level which minimize the total cost of the firm. As we know that excessive inventory increases the more capital investment and inadequate inventory level may not fulfill the demand of the customers or may not successes to run the business smoothly. Therefore, excessive and inadequate level of inventory both is not suitable to the manufacture enterprises. So, the firm must maintain the appropriate level of inventory in a firm to avoid both excessive and inadequate level of inventory. Therefore, the main aim of the managing inventory is to avoid the over stock and under stock and try to maintain the optimal level of inventory for the sound operation of the business.

All manufacturing enterprises, nearly 90% of amount are invested in inventories. So, it is necessary to give proper attention in handling the inventories management in an enterprise. The efficient management system of inventories gives the following information on time relating to the inventories such as:

-) What kinds of inventories to be purchase?
-) Where to purchase?
-) By whom to purchase?
-) How to purchase?
-) Where to store?

Thus inventory management system helps to use different tools and techniques which minimize the overall inventory cost and maximize the profitability of the firm by smooth running of the business.

2.1.1 Classification of Inventory:

Every manufacturing enterprise has its own types of inventory. Inventory can be classified on the basis of the following headings i.e. namely raw materials; work in process; and finished goods.

a) Raw materials:

Raw material is very important factors for production. As we know that without raw materials the production process cannot be run effectively. Raw material can be express as a direct material which is the prime factor of production process and also become the integral part of the final product. Indirect materials are those materials which are not directly concerned with the final product but helps to run the business smoothly, such materials are oil for plant and machinery; stationary goods; packing materials etc.

Gorkhapatra corporation uses the following raw materials for publish the various types of newspaper and magazines, such as

- | | |
|--------------------------------|------------------------------|
| 1) P/S Plate 25x36 negative | 29) P/S Developer positive |
| 2) P/S Plate 30x36 negative | 30) P/S Plate 30x36 positive |
| 3) P/S Developer negative | 31) P/S Developer positive |
| 4) Tele Printer (T/P) Roll | 32) Blanket 30x36 |
| 5) Blanket 29x36 | 33) Blanket 24.5x 35 |
| 6) Blanket 24x35 | 34) Photo graphic film (b/w) |
| 7) Photo Graphic film in color | 35) Agfa Paper soft |
| 8) Alfa Paper Sterling No.2 | 36) Alfa Paper Sterling No.3 |
| 9) Image remover Positive | 37) Image Remover Negative |
| 10) Developer 163 | 38) developer 76 |
| 11) Gum Arbic | 39) Fountain solution |

- | | |
|-----------------------------------|----------------------------|
| 12) Blanket fix ink | 40) Color fest set ink |
| 13) Water offset (w/o) black ink | 41) Offset Dense Blank ink |
| 14) Photo Graphic Paper ford No.2 | 42)Graphic arts film 16x23 |
| 15) O/S process black ink | 43) O/S cyan black ink |
| 16) O/S Majanta red ink | 44) O/S royal blue ink |
| 17) O/S yellow ink | 45) O/S Gloria red ink |
| 18) O/S white ink | 46) O/S vivid green ink |
| 19) IPC opaque | 47) Phosphoric acid |
| 20) Sprite (rectified) | 48) Anfix |
| 21) Cotton | 49) Spong (Viskovita) |
| 22) Red Cello tope | 50) Bardma plate |
| 23) Carbon rod 8 mm | 51) Finisher |
| 24) Setic acid | 52) Dunlop mubber solution |
| 25) O/S reducer oil | 53) Blanket wash solution |
| 26) Damping Hoge 190 No. | 54) Aestrollon Sheet |
| 27) IPC Lith Developer | 55) Damping Hoge 200No. |
| 28) Damping Hoge 190No. | 56) Damping Hoge 210 No. |

(Sources: Store Department of Gorkhapatra Corporation)

b) Work- in- Process:

The semi- finished products can be said as work- in- process. It means these are the products which needed more work before to convert into final or finished products. In other words, the work- in- process is neither a finished goods nor raw materials.

In an industry the same material may be the finished product but for the other industry such material may be the work-in- process, normally it depends upon the nature of the business activities. According to J.F.Weston and E.F. Brigham 1992, work-in-process refers to inventory units that are at various stages of completion; some of the inventory in work-in-process will be at the beginning stage of completion and some will nearly completed. If the

firm has work-in-process, then it will not have to completely shut- down production if a problem arises at one of the previous production stages. Generally Gorkhapatra Corporation does not keep the work-in- process inventory because of the nature of production.

c) Finished Product:

The final out put of the production process of any manufacturing enterprises is called final product. These are the products which are ready to sell to the customers' demand in the market. If the firm has to keep large amount of finished goods on hand, normally provides advantages to the marketing as well s production departments. From the marketing view points, large amount of finished goods enables to fill the orders of the customers; minimize the lost sales and avoids shipment delays due to the stock outs. From the production view points, maintaining large finished goods permits items to be manufactured in large production runs, which helps to keep the units production costs low by spreading fixed set- up expenses over large volume of output. (*Moyer, McGuigan & Kretlow; 1999*)

The finished goods of the Gorkhapatra Corporation have to be summarized as under:

- Gorkhapatra (Daily Nepali Newspaper)
- The Rising Nepal (Daily English Newspaper)
- Madhupark (Monthly Literature Magazine)
- Yuba Munch (Monthly Magazine)
- Muna (Monthly children Magazine)

2.1.2 Motives of Holding Inventory:

Inventory is necessary for production process. Inventory helps to run the business everyday. However every firm has to hold the inventory because of the following motives i.e. transaction, precautionary and speculative motive.

a) Transaction motive:

As we know that without inventory the production process and selling of finished product is not imagine. Therefore, transaction motive helps smooth operation of the business and sales of the final product.

b) Precautionary Motive:

Holding of inventory is the safety against the risk of unpredictable demand and supply of the product.

c) Speculative Motive:

Speculative motive influences the decision to increase or decrease the inventory level to take benefits in fluctuation of price.

2.1.3 Benefits of Holding Inventory:

Inventory is necessary for all manufacturing organization. So the organization must hold the optimal level of inventory for production. Holding inventory gives the following benefits to the corporation, which can be explained by the following headings:

a) To meet the irregular supply and demand change:

Due to the change in prices of the inventories, the firm may not to continue the production process. So if the company hold the sufficient amount of inventories then the production process cannot be stop which meet the demand of the customer' in the market.

b) To get quantity discount:

Firm's normally purchase the inventory in large volume for the smooth operation of the production. Purchasing huge amount of inventories generally takes heavy discount from the supplier and ultimately the cost of materials will be reduced.

c) To avoid stock outs:

Stock- outs is not good sign for the business organization. Raw materials stock outs interrupt the production process of the business where as finished product stock outs is not fulfill the demand of the customers. So, effective holding of the inventories avoids stock outs problems and ensure to more business in forward direction.

2.2 Objectives of Inventory Management:

Inventory is the one of the most important components of all manufacturing enterprises. Without inventory, the business activities cannot be formed. Keeping excessive and inadequate

inventory level is not healthy to the organization. So the managing optimal inventories levels are good for the all organizations. It helps to minimize the ordering cost and carrying cost of the inventory. Therefore, to maintain an optimal level of inventories in manufacturing enterprises are quite significant. But it is difficult to the management the optimal level of inventories because the optimum level of inventory always between two dangerous points of excessive and inadequate inventories. Effective management of the inventory in any manufacturing enterprises should be:

- i) Ensure a continuous supply of raw materials to facilitate uninterrupted production.
- ii) Maintain sufficient stocks of raw materials in periods of short supply and anticipate price changes
- iii) Maintain sufficient finished goods inventories for smooth sales operation and efficient customer service
- iv) Minimize in the production cost
- v) Control investment in inventories and keep it at an optimal level.

The objectives of inventory management should be neither excessive nor inadequate level of inventories. But maintaining sufficient inventories help to run the production and sales operations. An optimal level of inventory should be determined on the basis of the trade off between cost and benefits. The various objectives of inventory management can be summarized as follows:

- i) To minimize the total cost of inventory
- ii) To maximize the profit of the firm
- iii) To minimize wastage of storage cost
- iv) Reasonable price of raw materials
- v) No excessive investment in inventory
- vi) To give proper information about the availability of stock.

2.3 Need and Important of Inventory Management:

Inventory is an important factor of any manufacturing enterprises. It helps to regularity for running of production and sales operation smoothly. Therefore, maintaining optimal level of inventory is the main aim of inventory management. Thus, the need and significance of inventory management to a firm could be specified as below:

- i) It helps in maintaining a trade off between carrying costs and ordering cost, which results in to minimizing the total cost of inventory.
- ii) It facilitates maintaining adequate inventory for smooth production and sales operations
- iii) It avoids the stock-out problems that a firm otherwise would face in the lack of proper inventory management
- iv) It suggests the proper inventory control system to be applied by a firm to avoid losses, damages and misuses.

2.4 Inventory Cost Concept:

Inventory includes the different types of costs, such as holding costs, operation costs, shortage costs etc. Holding cost are those costs which are relating to the warehousing and handling of physical goods, operating costs are relating to the placing and ordering of manufacturing records which we are considered in production of batches and shortage cost are those costs which are failure to meet the demand of the customers. Thus, the firm has to apply the systematic and scientific inventory management system considering various cost factors to get the optimal inventory management. Generally, the first step inventory management is to identify all the cost involved in purchasing and maintaining inventories. Different types of cost of inventory can be summarized as below:

2.4.1 Purchase Price:

Purchase price is incurred only when the firm has to purchase the raw materials. Every organization has to try to minimize it without compromising specifications of materials through purchase management.

2.4.2 Carrying / Holding cost:

Carrying costs are the variable costs per unit of holding an item of inventory for a specified time period. Carrying cost includes cost of storage, handling and storage costs, insurance costs, proper tax, spoilage and obsolescence cost and system cost associated with the administration of the inventory system in use such as information gathering cost, supervision cost, physical stock checking cost, record keeping requirement cost on holding inventories. So, carrying cost is the first category of in inventory management cost, which is generally associated proportionally with the average value of inventory. (Era, 1989)

The total carrying cost is simply the product of carrying cost per units and the average inventory unit as devoted below:

$$\text{Total carrying costs [TCC]} = [C] \times [A]$$

Where,

C = Carrying costs per unit.

A = Average inventory unit.

Again, carrying cost per units [C] is calculated as below,

$$\text{Carrying cost per unit [C]} = [C\%] \times [P]$$

Where,

C% = Percentage of carrying cost.

P = Purchase price per unit.

$$\text{Average inventory units [A]} = Q/2$$

Where,

Q = Ordering quantity.

2.4.3 Ordering / Procurement Cost:

Another cost associated with investment in inventory is the ordering costs. Ordering costs include the fixed clerical cost of placing and receiving on order. It includes cost such as requisitioning, purchase ordering, transferring and receiving inspection and storing. Ordering

cost increases with the number of order increase, thus more frequently order of inventory occurs higher cost for the firms. On the other hand, if the firm maintained large amount of inventory level there will be few orders placed and such orders make the relatively ordering cost low. Therefore, the decrease in ordering cost with increasing the size of the inventory.

The total costs are expressed in terms of following relationship:

$$\text{Total ordering costs [TOC]} = [\text{O}] \times [\text{N}]$$

Where,

O = Ordering cost per order

N = Number of order to be placed

Where,

Number of order can be calculated by the following way:

$$\text{Number of order [N]} = \frac{\text{Annual requirement [A]}}{\text{Economic order quantity [EOQ]}}$$

Ordering cost are generally expresses due to the following reasons:

- | | |
|--|-----------------------------------|
| i) Transportation and shipping cost. | ii) Clearing and forwarding cost. |
| iii) Cost incurred when raw material in transit. | iv) Insurance of raw material. |
| v) Telephone/ Fax/ Postage expenses. | vi) Stationary cost. |
| vii) Bank commission. | viii) Cost of placing an order. |
| ix) Requisition cost. | x) Receiving, inspecting cost. |

2.4.4 Stock out Cost:

Stock out cost is related with demand and the depletion in stock result in loss in sales or bank order costs. When the sales are lost due to stock out, the firm loses both the profit margin on unmade sales and the firm's goodwill. If the customer uses another business else where, future profit margin may also be lost and bank order cost is needed to convince customers to use 1-21 again after inventories have been replenished. Bank order lost includes loss of goodwill,

money plaid to reorder goods and notification to customers when goods arrived. (*Adams and Ebert, 1993, pg: 142*)

Stock out cost = Inventory cycles per year- output units x probability of possible stock out x unit stock out cost

Where,

$$\text{Inventory cycle per order} = \frac{\text{Annual Sales}}{\text{Quantity Order size}}$$

2.4.5 Over Stock Cost:

When the demand of the product of terminated, as such condition, the goods are still remained unsold; it is called the over stock cost.

2.5 Inventory Management Techniques:

In inventory management technique, we seek how to minimize the total cost of inventory. As we know that adequate inventory level helps to provide regular delivery to the customers but on the other hand, excessive inventory is idle resources of the firm and the large amount of money is blocked unnecessarily. According to Alton N. Smith, “Inventory is money on which a company pays interest rather than collect interest. It is money always in danger of deviation. Non controlled inventory is an industrial danger.” To maintain the optimal inventory organization should used the inventory level techniques.

2.5.1 Economic Order Quantity (EOQ):

As we know that, firm needs some level of inventories to run the business smoothly but firm does not indicated the exact required quantity of inventory level at a time. For this EOQ can solve such kind of problem in every organization. Economic order Quantity (EOQ) is such quantity where total cost is minimize and total carrying cost and total ordering cost are equal at this level. Economic order quantity is also known as re-ordering quantity.

In 1915, F.W. Harris developed the famous economic order quantity (EOQ) formula. Later through the consultant Wilson, this formula gained wide use in industrial area. Later on,

this formula was developed by Harris. Still now, this formula is widely used in inventory for independent demand. The EOQ model is an inventory management techniques used to find out the optimal inventory level for an organization.

The optimal ordering quantity or Economic order quantity (EOQ) can be calculated by the following formula, if the price of the inventory remains constant.

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

Where,

A= Annual demand or annual requirement

O = Ordering cost per order

C = Carrying cost of one unit of inventory

= % of per unit inventory price.

A) Assumption of Economic Order Quantity:

- i) The forecasted demand for a given period, usually one year is known.
- ii) The Demand is even throughout the period.
- iii) Inventory orders can be replenished immediately (there is no delay in placing and receiving orders)
- iv) There are two distinguishable costs associated with inventories: ordering costs and carrying costs.
- v) The cost per order is constant regardless of the size of order.
- vi) The cost of carrying is a fixed percentage of the average value of inventory.

B) Determination Economic Ordering Quantity:

Economic Order Quantity (EOQ) can be determined in many ways. They are mentioned as under:

- i) Mathematical “OR” Formula Approach.
- ii) Graphical Approach.
- iii) Trial and Error Approach or Tabulation Approach.

i) Mathematical “OR” Formula Approach:

One of the commonly used methods to determine economic order quantity is mathematical or formula approach. Under this approach, the economic order quantity can be calculated with the help of the following equation.

$$EOQ = \frac{(2AO)}{C}$$

Suppose:

Annual requirement (A) = 10,000 units.

Ordering cost (O) = Rs. 32

Carrying cost (C) = Rs 1 per unit.

Solution:

$$\begin{aligned} EOQ &= \frac{(2AO)}{C} \\ &= \frac{(2 \times 10,000 \times 32)}{1} \\ &= 800 \text{ units.} \end{aligned}$$

Therefore, the Economic order quantity (EOQ) = 800 units

ii) Graphical Approach:

In Graphic Approach, the EOQ can be determined by the interaction between ordering cost and carrying cost. Under this approach, the carrying cost, ordering cost and total cost are shown on the graph. It is based on the principal that the total cost increases as the order size increases. However, the ordering cost decreases if the order size increases.

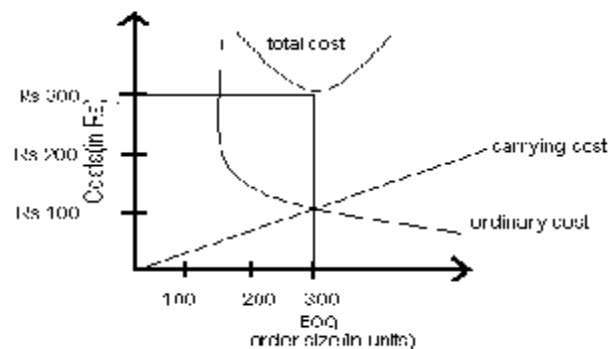


Fig 1: Graphical Presentation of EOQ

From the above figure, the vertical axis shows the inventory costs and horizontal axis shows the order size. The total cost line represents the sum of the ordering costs and carrying costs for each order quantity. The EOQ is determined at the point of interaction between total carrying cost and total ordering costs, where total cost is minimum. In the given figure, EOQ is 300 units and the minimum total cost at this order quantity is Rs 300.

iii) Trail and Error Approach “OR” Tabulation Approach:

Under this approach, first of all ordering number and order quantity are determined and then total calculated the total carrying cost and total ordering cost to be fined. After total cost to be determined with the help of adding these two total cost and ordering cost. At last, calculation of the total cost of different order size and select the least cost, that least cost determine the Economic order quantity (EOQ). In below table, the total cost is least in one condition, where the carrying cost and ordering cost are equal. In other words, this approach, the carrying and ordering costs for different sizes of orders to purchase inventories are computed and the order size with the lowest total cost of inventory is the e3conomic order quantity.

It can be cleared by the following illustration.

Suppose: Annual requirement (A) = 5000 units

Ordering costs (O) = Rs 1500

Carrying costs (C) = Rs 2.40

Solution:

Table: 1 Trial and Error Approach

No. of orders (N)	1	2	4	8	10	20
Order size (Q)	5000	2500	1250	625	500	250
Average inventory (Q/2)	2500	1250	625	312.5	250	125
Total Ordering Costs (TOC)	1500	3000	6000	12000	15000	30000
Total Carrying Costs (TCC)	6000	3000	1500	750	600	300
Total inventory Costs (TOC+ TCC)	7500	6000	7500	12750	15600	30300

In above table, the minimum total cost is Rs 6000, where determined the Economic order quantity (EOQ) 2500 units. Here, total ordering cost and total carrying cost are equal i.e. Rs 3000.

2.5.2 Re- order point (Re-order level):

As we know that, EOQ model under the assumption that the level of sales are forecasted with certainty, the level of usage are constant over the time period and inventory could be replace as immediately as required. At such situation EOQ solves the problem of how much to order. But another problem to the inventory management is to determine when the re-order should be placed. The re-order point (ROP) or re-order level (ROL) refers to the level of inventory at which a re-order should be placed to receive the inventory at the time when previous stock is exactly finished. To determine the re-order point under certainty, we should know (i) lead time, (ii) daily average consumption, (iii) Economic order quantity. Lead time is the number of days between the placement of order and the delivery. By certainty we mean that consumption and lead time do not change. Re- order point is determined by the following formula:

$$\text{Re-order point (ROP)} = \text{Lead time} \times \text{Average consumption / usage}$$

The Re-order point can be cleared by the following figure:

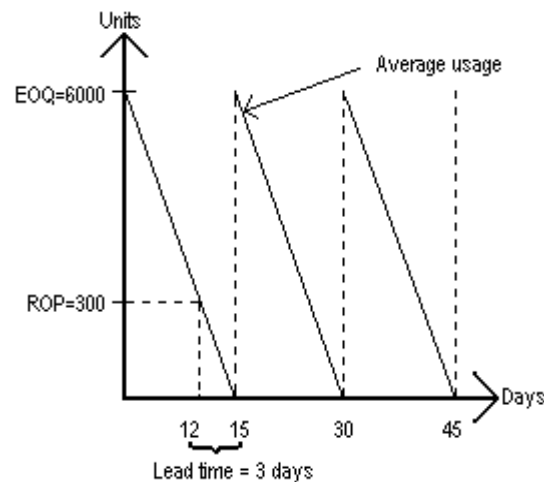


Figure: 2 Re-order Point (ROP)

Suppose: Lead time = 3 days
Annual requirement (A) = 36000 unit
Days in a year = 360 days

Solution: Re-order point (ROP) = Lead time x Average consumption (days)
= 3days x 100 units
= 300 units.

Working note:

Daily consumption = $\frac{\text{Annual requirement (A)}}{\text{Days in a year}}$
= $36000 / 360 = 100$ units

Here, 300 units of inventory level in hand at the time of placing order is called the re-order point. That means we must place a re-order when previous inventory level declines to 300 units. This condition is already shown in above figure.

Normally, if a new order is received, good-in-transit inventories will occur. Good-in-transit are goods that have been ordered but have not been received yet. If the normal delivery lead time is greater than the order period or frequency, there will be goods-in-transit. At such condition ROP can be calculated as follows:

ROP = Lead time x Daily consumption – Goods-in-transit.

Thus, ROP is important for every organization because it gives the clear picture about the inventory to be re-ordered. And the firm will be saved from the stock out problems.

2.5.3 Safety Stock:

So far we assumed the condition of certainty, but in the reality the situation what we assumed that may not be accurate. It means, the lead time and average consumption cannot be forecasted accurately because the demand for the product and lead time may variation over the time period.

In such condition, the organization may face the stock-out problems. Therefore, to avoid the possibilities of being out of the stock due to the increase average consumption and excessive

lead time. So, the organizations have to maintain the safety stock. Safety stock can be calculated by the following equation:

$$\text{Safety stock} = \text{Average consumption} \times \text{lead time.}$$

2.5.4 Maximum Stock Level:

Maximum stock level refers to the maximum quantity of an item of inventory which can be held in stock at any time that stock should not exceed this quantity. The maximum stock level is fixed by taking into account the following factors:

- Amount of capital available for maintaining stock
- Maximum requirement of the stock for production purpose at any point of time
- Risks of obsolescence and deterioration
- Possibility of change in fashion and habit, which will necessary change in requirement of materials.

Maximum stock level can be calculated by the following equation:

$$\text{Maximum level} = \text{Re-order level} + \text{Re-order Quantity} - (\text{minimum consumption} \times \text{minimum re-order period})$$

2.5.5 Minimum Stock Level:

Minimum stock level is the lowest level of inventory by the firm should maintain at any time. Minimum stock level quantity is generally fixed so that production or sales of goods may not be hold up due to the shortage of that inventory. The following factors should be taken into the account while maintaining minimum stock level.

- Lead-time that is time lag between ordering and receiving the inventory
- Rate of consumption of the inventory during the lead time
- According to the nature of inventory, minimum level does not required against the customers specific orders

Minimum stock level can be computed by the following equation:

$$\text{Minimum stock level} = \text{Re-order level} - (\text{normal consumption} \times \text{normal re-order period})$$

2.5.6 Average Stock Level:

Average stock level; can be defined as the sum of minimum stock level and one half of the economic order quantity, which can be calculated as following way:

$$\text{Average stock level} = \text{Minimum stock level} + \frac{1}{2} \text{EOQ}$$

2.5.7 Danger Stock Level:

The levels of inventory at which normal issues of the materials are stopped and issued are made only under specific condition.

2.6 Inventory System:

2.6.1 Concept of Inventory Level:

As we know that, inventory is usable, but idle resources, the term stock is generally used to refer to resource in its physical and tangible form, like materials. Thus, 'stock' and inventory as synonyms used by the firm. Different types of inventories are kept by the firm to meet the demand of the customers. In order to know the concept of inventory and its application in a reality, it will necessary to clear the view about the concept of inventory system. The concept of the inventory system can be categorized as below:

2.6.2 Multi – Stage Inventory:

Multi-Stage Inventory system focuses on the inventories of different points of production stages and tries to maintain the balance of the inventory level at different stages for the whole conversion system. At this stage at he company has to maintain inventory such as parts and components, work-in-progress in different production stages to produce desired products or goods in time. Such type of stage can be demonstrated by the following figure:

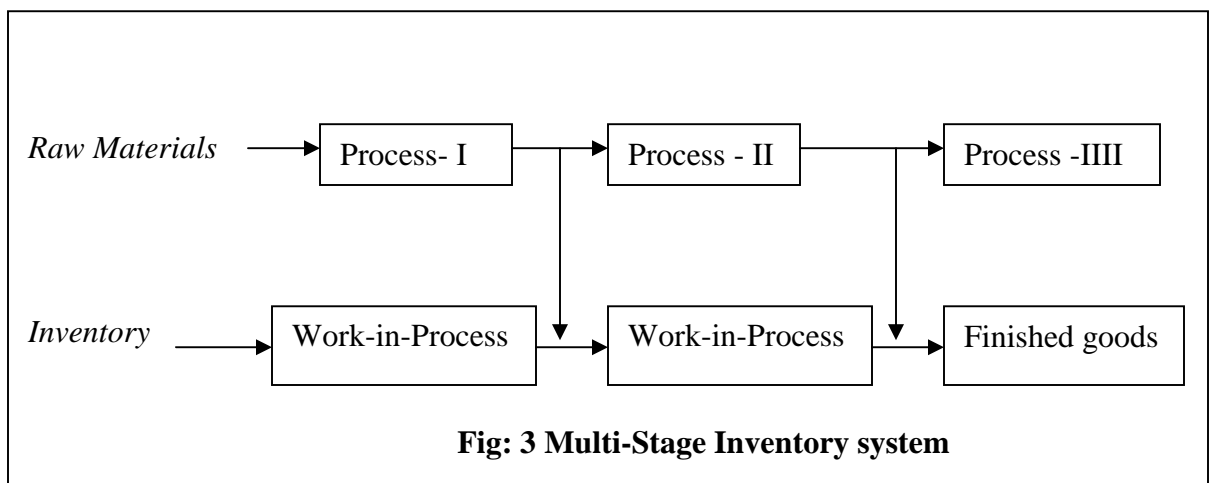


Fig: 3 Multi-Stage Inventory system

2.6.3 Multi-Level Inventory:

Multi-level inventory system is that system of distribution of finished goods to the customer by the help of proper marketing channel. The company has to maintain the different level for distribution of goods in the market place. In other words, the company has to manage the inventories at different point of distribution system which can be presented by the following figure:

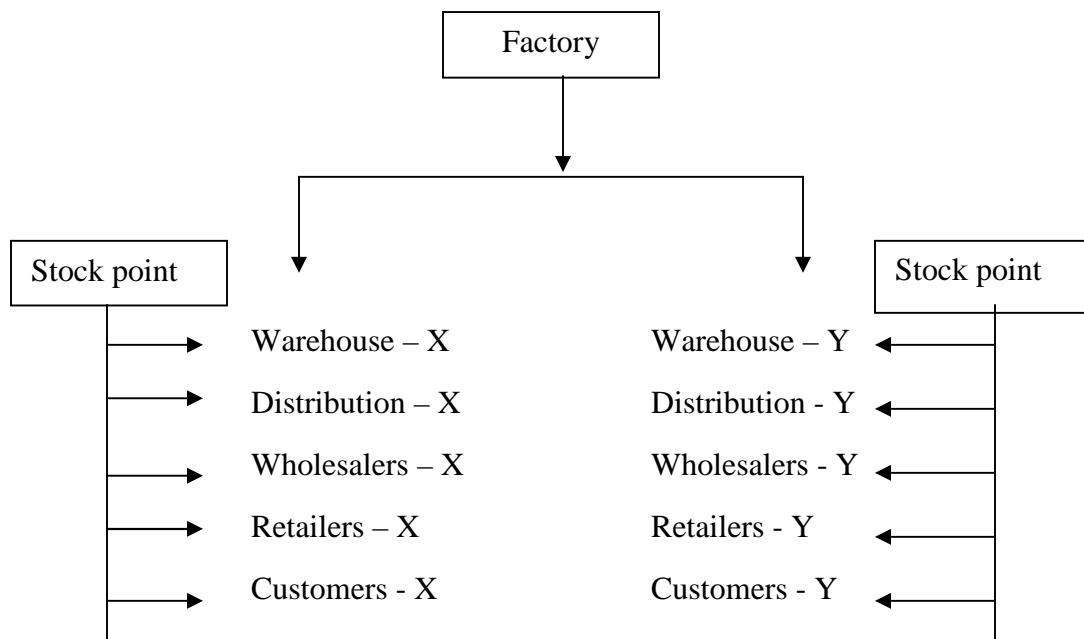


Fig: 4 Multi- Level Inventory system

2.7 Inventory control System

Inventory control may be defined as a planned method whereby investment in inventories held in stock is maintained in such a manner that it ensures proper and smooth flow of materials needed for production operations as well as sales while at the same time, the total cost of investment in inventories is kept at a minimum. The inventory management is also concerned with establishing and applying proper inventory control system, which are described below:

2.7.1 ABC Analysis:

ABC analysis is a widely used classification technique to identify various item of inventory for the purpose of inventory control. In this analysis, the organization should classify the inventories to identify which items should receive the most effort in controlling. The firm may use the selective control system for the various types of inventories. This analytical approach is called the ABC analysis and tends to measure the inventories to classify the inventories into A, B, & C categories on the basis of their values.

Category 'A' consists of those items of inventories, which covers about 15% in the items of Quantity but covers 70% of investment amount.

Category 'B' consists of those items, which covers about 30% in quantity but involves 20% of investment amount.

Category 'C' includes those, which have about 55% quantity but covers only 10% of investment amount.

The example of the ABC analysis can be explained by the following table:

Category	Percentage of items	Percentage of cost
A	15%	70%
B	30%	20%
C	55%	10%
Total	100%	100%

From the above table, Category 'A' has highest percentage cost but lowest percentage of items. But Category 'C' has least percentage of cost but highest percentage of items. Similarly Category 'B' has less percentage cost than 'A' but more than 'C' and more percentage of items than 'A' but less than 'C'.

ABC analysis can also be represented by the graphical method, which can be showed below:

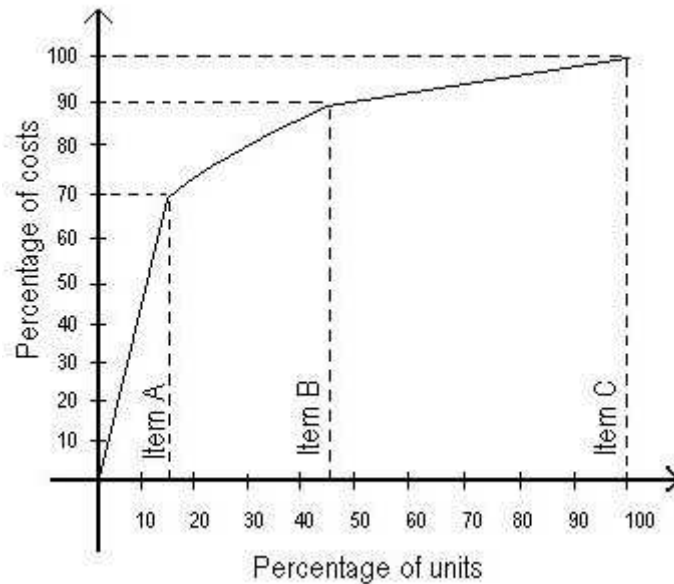


Fig: 5 Graphical Presentation of ABC analysis.

The above graphical presentation shows that ‘Item A’ has minimum percentage i.e. 15% of total units of all items but it represents the highest value i.e. 70% of total investment amount. ‘Item C’ has maximum percentage i.e.55% of total units of all items but it represents the lowest value i.e. 10% of total investment amount. ‘Item B’ occupies the middle place, therefore, the firm has to highest control ‘Item A’ and simple or lowest control on ‘Item C’ in order to maximize the profitability on its investment.

The items in A, B & C categories can be compared in the following tabular form.

Nature	A: Items having high consumption value	B: Items having high consumption value	C: Items having high consumption value
Extent of control	Very strict control	Moderate control	Low control
Frequency of	Frequent ordering	Once in three months	Once in six months or

order			once in a year
Lead time	Maximum efforts to reduce lead time	Moderate efforts to reduce lead time	Minimum efforts to reduce lead time
Level of management	Must be taken care by senior officer	Can be supervised by middle management	Can be supervised by clerical staff
Period of review	Review after a month or every 15 days of waste, obsolete and surplus items	Review after 3 months of waste, obsolete and surplus items	Annual review over obsolete and surplus items
Sources of supplies	As many sources as possible for each item	Three or more reliable sources	Three reliable sources for each item
Follow-up	Maximum follow-up	Periodic follow-up	Follow-up only in exceptional cases
Safety stocks	Very low safety stocks	Low safety stocks	High safety stocks
Centralization	Centralized purchasing	Centralization and decentralized purchasing	Decentralized purchasing
Value analysis	Rigorous value analysis	Moderate value analysis	Minimum value analysis

(Sources; Richardmode: 1969)

Table No: 2 Items of A, B & C categories

2.7.2 Red line method:

Under this system a red line is drawn around the inside of the bin used for stocking inventories. This red line represents the re-order point on inventories. When the level of inventories reach down to red line drawn in the bin, a re-order is made.

2.7.3 Two Bin System:

Under two bin systems, inventories are stocked in two separate bins. When the stocks in one bin are completely used, the firm places a re-order to fill the bin and inventories are drawn for used from the second bin.

2.7.4 Computerized System:

The work of keeping inventory record, cost determination and sending the order of procurement according to the requirement through computer is call computerized system. Generally larger firms design a specific computer programming to count the stock of inventories.

2.7.5 Statistical Inventory Control System:

A number of firms with widely spread distribution system find the use of mathematical model and electronic pattern inventory location level best reconcile consideration of customer service, manufacturing and have been developed to help inventory management decision.

2.7.6 Just-in-Time (JIT):

Just-in-time is also used as a technique in inventory management. Just-in-time is a system of inventory control in which a firm coordinates production with suppliers so that raw materials or components arrive just as they needed in the production process. In this system the inventories are received as and when they are needed for production that facilitates the firm to minimize carrying cost of inventory. Application of JIT requires efficient purchasing procedure, most reliable suppliers and effective method of handling inventory. Therefore, JIT emphasizes waste reduction, total quality control, and devotion to the customers.

2.8 Review of the related studies:

Inventory management is wide subject but no one pay attention in this field. Many modern techniques to control inventory management have been realized. In our country there are number of public and private enterprises have been established as well as analysis has been

made but only the aspect of financial performance. In the field of inventory management, only few researchers have made the research on the inventory management of the manufacturing company. An attempt is made to review some of the researches, which have been submitted in inventory management in the context of Nepal.

Hang Narayan Limbu (2007) has made a research on the topic of **“Inventory Management, A case study of salt trading corporation”**. The main objectives of Mr.Limbu study are to identify the inventory management practice in STC and its impact on profitability. Further, more Mr. Limbu also try to analyze the relationship of inventory with sales and profit of the firm.

The researcher has collect related data from the factory using published and unpublished official records. He also used journals, magazines, government and universities publications as a source of secondary data. Limbu used EOQ, ABC analysis ratio, trend analysis approach to present and analyze the data. Some of his major findings can be presented below:

- Corporation try to applying techniques of inventory management like as ABC analysis and EOQ analysis, however, it is found that the use of both technique are unsystematic and ineffective.
- Inventory to total assets ratio are not constant over the study period.
- It is clear that inventories turn over ratio is decreasing during the study period except fiscal year 2060/61 but seems satisfactory level at stuffy period.
- Sales and net profit also fluctuation for the entire study period. Sales are increasing to certain level then start to decline severely.
- Procurement trends of salt trading corporation also fluctuating in every year of the study period.
- According to regression model, there is positive correlation between sales and closing inventory based on the study period.

Vibhas Gautam (2001) has conducted a research study on “**A study of inventory Management of Nepal Oil Corporation Limited**” to analysis the efficiency and present policy of inventory management of NOCL. His objective was to determine the problem faced by NOCL in application and practice on inventory management.

He has collected the related information and data from primary and secondary data are obtained from published and unpublished documents related to NOCL. He gathers books, articles, magazines and official records of NOCL for the company’s actual data collection. The researcher has applied correlation and regression, EOQ, safety stock, trend analysis approaches to evaluate and examine the gathered data. Some of his significant findings can be presented below:

- NOCL is the only one organization to supply the petroleum fuel in our country; therefore, it has to act in favor of consumer interests and needs.
- NOCL’s inventory control system is weak; therefore, the company has always suffered over stock or stock out situation.
- NOCL is failed to practice basic inventory management techniques and it always maintain rough safety stock for 35 days, which is fluctuating every time.
- NOCL has not applied scientific inventory management

Anuja Pathway (2005) has studied on the “**Inventory Management of Hetauda Cement Industry Limited**” for her degree thesis. She has collected the related information and data from primary and secondary data are obtained from published and unpublished documents related to Hetauda Cement Industry Limited. Some of his important findings can be presented below:

- Hetauda Cement Ltd. Has no target for materials purchase in the industry likewise price quantity of the materials of the materials are more fluctuating in every year.
- Hetauda Cement Ltd. Was not following economic order quantity model for purchasing the inventories decision.

- Hetauda Cement Ltd. had invested huge amount in inventory and its value was fluctuating in every years.
- Hetauda Cement Ltd. Has not good position of inventory to current assets ratio.

Puspa Raj Baral (1994) has conducted the research work on the topic of inventory management “**A case study of Gandaki Noodles P.Ltd**” the data were used basically on the primary and the secondary data for the analysis of this thesis. The main objectives of this thesis are to find out the inventory management system exercises by the company and also fine the optimal level of inventory for the company. He has pointed the some of the major finding, which can be presented below:

- The changing rate of the cost price and selling price is not the similar.
- Factory is running in the profit and inventory turnover ratio seems to be satisfied
- The factory gets most of the raw materials in Nepal and some of the materials are imported from Japan and Singapore also.
- This factory is not applying the EOQ model for the inventory order.
- Factory also not used ABC analysis in the inventory management control system.

Saroj Prasad Uppahadya (2005) has conducted master degree dissertation entitled “**Inventory management system applied by the Kantipur publications**”. He has used primary and the secondary data for the preparation of this thesis. The main objectives of this study is to examine the existing inventory management system applied by the Kantipur Publications (P) limited, to identify the problems faced by the publications in scientific inventory management system and to suggest the proper inventory model suitable to the publications. He has pointed the some of the major finding, which can be presented below:

- Kantipur publication could not apply a suitable inventory management model to reduce its inventory costs.
- Kantipur Publication has not been used fully for findings out the optimum level of inventory.

- Kantipur Publication holds high quantities of safety stock than its requirement that creates the over burden to inventory cost.
- Kantipur Publications has not taken any steps to records proper data relating to inventory management. There was no any separation of ordering and carrying costs. And proper control mechanism like ABC analysis was not been used.

2.9 Research Gap:

From the review of above different literatures, it can be said that many thesis have been written related to the inventory management but only few topics are written on the inventory management of print media. Gorkhapatra Corporation is the first and leading business organization in the field of print media of Nepal. Therefore, this thesis is different from the other thesis. This study will be fruitful to those interest persons such as researchers, students, teachers, business executives and the government organization for the policy perspectives.

CHAPTER – III

RESEARCH METHODOLOGY

3.1 Introduction:

Research methodology is the way to solve systematic about research problem. It is the process of arriving at the solution of problem through the planned and systematic dealing with collection, analysis and interpretation of facts and figure. The objections of the study are to analyze the inventory management and different control system of Gorkhapatra Corporation. To achieve this objective, the study requires different appropriate research methodology.

This study tries to focus on how the effective inventory management to maintain systematically and how we can control the inventory properly in corporation. To achieve such objectives the following research methodology has been purposed, which involves research design, nature and sources of data, data collection and analytical tools are used.

3.2 Research Design:

The research design refers to the systematic framework under which the research is conducted. It is well planned structure and it is the strategy for investigation. Research design involves selecting the most appropriate method of techniques to solve the particular problems under investigation. Here analytical as well as descriptive research design has been adopted to clarify the situation through presentation and analysis of different data.

3.3 Nature and Sources of Data:

Information is the life blood to conduct the any kind of research work. Here, researcher has used only the secondary data to achieve of this study. Secondary data were collected from the following information:

- i) Published data were collected through the corporation's record books.

ii) Both published and unpublished data related to the inventory management are taken into account

iii) Articles, books, magazines and previous studies are also taken into the consideration

Therefore, all the gather data have been used according to the necessity of this study.

3.4 Data collection procedure:

Data collection method is the most important for the research work, which is directly obtained from the official personnel, for this the researcher, has to visit the department office frequently to get the data. All the collected data have been used according to the need and requirement of the study.

3.5 Data Processing Procedure:

All the financial statement such as balance sheet, profit and loss accounts, stock verification set and other related data were collected from the available sources. All these information were grouped at one place and analyzes thoroughly. After analyzing information it is re-arranged, summarized and presented in suitable table form and graph to make analysis easy and clear.

3.6 Data Analysis Tools:

This research work is basically conducted on the inventory management field. So the data related to the inventory management is collected from the various sources and manage them properly for explanation and interpretation. To analyze the collected data, various financial and statistical tools and technique were used to analyze the effectiveness of inventory management and control whenever necessary. Different types of analytical tools were used to analyze inventory management of the Gorkhapatra Corporation, which can be elaborate below:

a) Economic Order Quantity (EOQ):

Economic order quantity technique is the most important of inventory control. It helps to establish the economic balance between the carrying and the ordering cost determining the

quantities to be order. Economic order quantity minimizes the total inventory cost by making the equal ordering and carrying costs. It can be calculated by the following mathematical formula:

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

Where,

A = Annual requirement in units

O = Ordering cost per order

C = Carrying cost per unit

EOQ can also be calculated by the helped of Graphical and trial and error method. The main objective of this technique is to determine the optimal size of order to be placed on the basis of ordering and carrying cost.

b) Re-order Level (ROL):

The re-order point (ROP) or re-order level (ROL) refers to the level of inventory at which a re-order should be placed to receive the inventory at the time when previous stock is exactly finished. It is calculated on the basis of rate of consumption, minimum level, delivery time and stock cost. There are some formulas are used for calculation:

Re-order Level = Maximum Consumption x Maximum Delivery time

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

Where,

Safety stock = Amount of stock needed to keep against a stock market

Lead time = the time span between placing an order and receiving the goods

Re-order Level = Minimum Level + consumption during the time required to get the fresh delivery (i.e. Daily requirement x time required for fresh delivery)

c) Safety Stock:

Safety stock is necessary for every manufacturing organization. The different level of quantity of safety stock depends on the policy of the company. Generally, the size of the safety stock is

determined on the basis of predictable lead time and demand variation, which can be calculated by the following ways:

i) On situation when demand rate varies.

Safety stock = Lead time x (maximum demand rate – average demand rate)

ii) On the situation when both demand rate and lead time fluctuate.

Safety stock = Maximum lead time x Average demand rate.

iii) On the situation when lead- time varies demand uniform.

Safety stock = Maximum lead time – average lead time x demand

d) Inventory Turnover Ratio:

Inventory turnover ratio is the relationship between the inventory level and cost of goods sold. It tests the efficiency of the inventory to convert it into the sales. Suppose that, if a company has a high turnover ratio that indicates good inventory management, as a result finished goods are quickly sold at a desirable period. Inventory turnover ratio can be calculated by the following formula:

$$\text{Inventory Turnover Ratio} = \frac{\text{Costs of Goods Sold}}{\text{Average Inventory}}$$

e) ABC analysis (Selective inventory control):

Every firm has different types of inventory and also different in their total value. So the firm has to pay more attention to those inventories which have highest value and pay low attention to the least value items. Therefore, such type of analytical approach is called ABC analysis. In ABC analysis, the high value items are classified into “A” category; least value items are classified into “C” category and items “B” falls between these two categories and pay moderate or reasonable attention to it.

CHAPTER – IV

DATA PRESENTATION AND ANALYSIS

Data presentation and analysis is the important part of the any research work. Raw data available in the source of related organizations or corporations are needed to process and analyze properly which helps to reach the research work in conclusion. Generally, data and information collected from the company will be analyzed in this chapter.

The main objectives of this study are to analyze the present practice of the inventory management system in the Gorkhapatra Corporation. To achieve the above objectives, we use different inventory management tools and the techniques. In addition, the researcher has to try to show the existing problem and diagnosis of the problem by analyzing the collected data and information and also provide the necessary suggestion and recommendation to the Gorkhapatra Corporation. Here, we are presenting the five years historical data (i.e. From 2060/2061 to 2064/2065) in EOQ model, ABC analysis, Trend analysis and Re-order point (Level).

4.1 Economic Order Quantity Model:

Economic order quantity is an important inventory control technique. This technique is widely used in different countries as well as in Nepal. Today most of the Nepalese organizations have followed inventory management technique to minimize the total cost. The calculation of the EOQ is based on the five years data, which are presented below:

EOQ for the fiscal year 2060/2061

Item “A”: *Newsprint Paper*

To calculation the economic order quantity of “Newsprint Paper” for the fiscal year 2060/2061; following data are available from the corporation’s record:

Annual Demand (A) = 688 Mt.

Per order quantity = 300 MT.

Cost per metric ton = Rs 37500

Total amount tied up = Rs 37500 x 688

= Rs 25800000

No. of order placed within a year = 688 / 300

= 2.29 times

Ordering cost:

Fright charge (from Calcutta to Kathmandu) = Rs 4000000

Custom duty = Rs 1290000

Labor charge = Rs 20000

Bank commission = Rs 129000

Total ordering cost per order (O) = Rs 5439000

Carrying Cost:

Jilla Sahakari Sangh limited & national trading corporation = Rs 600000

Insurance = Rs 520000

Obsolescence 1.5% of the total value (0.015 x Rs 25800000) = Rs 387000

Total carrying cost = Rs 1036000

Carrying cost per metric ton (C) = Rs 1036000 / 668

= Rs 1505.81

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 688 \times 5439000) / 1505.81 \\ &= 2229.37 \text{ MT.} \end{aligned}$$

No. of order in a year = Annual demand / EOQ

= 688 / 2229.37

= 0.3086 time or 1 time

From the above EQO calculation, it can be conclude that if the corporation wants to minimize the total cost, then it should be ordered 2229.37 MT. of Newsprint. The company has to purchase the newsprint 0.3086 times or 1 time.

Item “B”: (a) *Ink*

On the basis of corporation’s record book, the following data are available for the input ink.

Annual Demand (A) = 11720 kg

Price per kg. = Rs 150

Order quantity per order = 3500 kg

Total amount tied up = Rs 150 x 11720 kg
= Rs 1758000

No. of order placed within a year = 11720 / 3500
= 3.35 or 4times

Order cost:

Bank Commission	= Rs 8790
Custom Duty	= <u>Rs14064</u>
Total order cost per order	= <u>Rs 22854</u>

Carrying cost:

Storage cost	= Rs18900
Obsolescence charges 2% of the total cost (0.02 x Rs 1758000)	= <u>Rs 35160</u>
Total carrying cost	= <u>Rs 54060</u>
Carrying cost per Kg (C)	= Rs 54060 / 11720
	= Rs 4.61

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

In this way,

$$\begin{aligned}
 \text{EOQ} &= (2AO)/C \\
 &= (2 \times 11720 \times 22854) / 4061
 \end{aligned}$$

$$= 10779.7 \text{ kg}$$

No. of order with in a year = Annual demand / EOQ

$$= 11720 / 10779.7$$

$$= 1.087 \text{ or } 2 \text{ times}$$

From the above calculation, in order to minimize the total ordering and the total carrying cost the company should order 10779.7 kg of ink at a time.

Item "B": (b) Film sheet:

Film sheets are very important for the printing process. And such type of materials is purchase regularly in the corporation. The following information is available in the corporation's record book related to the film sheet.

Annual demand (A) = 12000 sheets

Price per meter = Rs 200

Order quantity per order = 6000 sheets

Total amount tied up = (Rs 200 x 12000 sheets)

$$= \text{Rs } 2400000$$

No. of order placed during the year = 12000 / 6000

$$= 2 \text{ times}$$

Order cost:

Bank commission = Rs 12000

Custom duty = Rs 19200

Labor charge = Rs 7000

Total ordering cost per order (O) = Rs 38200

Carrying Costs:

Storage cost = Rs 16200

Obsolescence charges 2% of the total cost (0.02 x Rs 2400000) = Rs 48000

Total carrying cost = Rs 64200

Carrying cost per sheet (C) = Rs 64200 / 12000 = Rs5.35

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 12000 \times 38200) / 5.35 \\ &= 13090.62 \text{ sheets} \end{aligned}$$

$$\begin{aligned} \text{No. of Order} &= \text{Annual demand} / \text{EOQ} \\ &= 12000 / 13090.62 \\ &= 0.916 \text{ or } 1 \text{ time} \end{aligned}$$

Here, the economic order quantity is 13090.62 sheets. It means the company should order 13090.62 sheets to minimize the total cost of the inventory in an organization. The corporation has to order 1 time to fulfill its requirement of the film sheets

Item “B”: (c) Aluminum Sheets:

To produce the different types of newspaper in the organization, first of all it should be print in the aluminum sheet and then only in the paper. Such type of aluminum is needed to purchase in the organization. On the basis of corporation’s record book, the following data are available for the aluminum sheet.

Annual demand (A) = 6200 sheets

P rice per sheet = Rs 270

Order quantity per order = 3000 sheets

$$\begin{aligned} \text{Total amount tied up} &= \text{Rs } 270 \times 6200 \\ &= \text{Rs } 1674000 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed during the year} &= 6200 / 3000 \\ &= 2.066 \text{ or } 3 \text{ times} \end{aligned}$$

Order costs:

Bank commission	= Rs 13392
Custom Duty	= Rs 9370
Labor charge	= <u>Rs 6000</u>
Total ordering cost per order (O)	= <u>Rs 28762</u>

Carrying costs:

Storage costs	= Rs 28000
Obsolescence and charge of the total cost (0.02 x Rs 1674000)	= <u>Rs 33480</u>
Total carrying cost per year	= <u>Rs 61480</u>
Carrying cost per kg (C)	= Rs 61480 / 6200
	= Rs 9.91

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 6200 \times 28762) / 9.91 \\ &= 5999.06 \text{ sheets} \end{aligned}$$

$$\begin{aligned} \text{No. of order} &= \text{Annual demand} / \text{EOQ} \\ &= 6200 / 5999.06 \\ &= 1.033 \text{ or } 2 \text{ times} \end{aligned}$$

From the above calculation, the economic order quantity is 5999.06 sheets which means if the company order 5999.06 sheets then the company's total order and carrying cost will be equal, at last the total cost will be minimized.

Item "C" (a) Chemicals:

The corporation used different types of chemical like Fountain solution, blanket fixture, Remover negative, Acetic acid, Paper developer, Phosphorous acid, rubber solution blanket wash solution etc.in the production process. For the chemical it is very difficult to keep the record of each item separately. Therefore, the calculation of the EOQ is quite difficult so that the total annual cost incurred for the chemicals in this corporation for this fiscal year is Rs 750000 approximately.

Item “C” (b) Stationary:

Stationary items have been kept in the “C” categories because it is least important for the production process. Stationary items include such as Pen, Tipex, Pilot Pen, Scale, Rubber, Register, Cello tape, Punching machine, Stapler Pin, Print Roll, and Blade etc.

According to the financial record of the Gorkhapatra Corporation for the fiscal year 2061/062, the total cost for the stationary item is Rs 520000 approximately. The demand for the stationary items is not fixed so that such items are purchased when needed. Therefore, the calculation of the EOQ is difficult in stationary items. So the corporation orders such items in every four months in a year. If any items used rapidly then these items should be ordered frequently. The corporation has to check stationary items in every 3 months to determine of the new order.

EOQ for the fiscal year 2061/062

Item “A”: *Newsprint Paper*

To calculation the economic order quantity of “Newsprint Paper” for the fiscal year 2061/2062; following data are available from the corporation’s record:

Annual Demand (A) = 735 MT.

Per order quantity = 350 MT

Cost per metric ton = Rs 39000

Total amount tied up = Rs 39000 x 735

= Rs 28665000

No. of order placed within a year = $735 / 350 = 2.1$ times

Ordering cost:

Fright charge (from Calcutta to Kathmandu) = Rs 4200000

Custom duty = Rs 1433250

Labor charge = Rs 24000

Bank commission = Rs 1433250

Total ordering cost per order (O) = Rs 7090500

Carrying Cost:

Jilla Sahakari Sangh limited & national trading corporation	= Rs 600000
Insurance	= Rs 143325
Obsolescence 1.5% of the total value (0.015 x Rs28665000)	= <u>Rs 429975</u>
Total carrying cost	= <u>Rs1173300</u>
Carrying cost per metric ton (C)	= Rs 1173300 / 735
	= Rs 1596.32

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 735 \times 7090500) / 1596.32 \\ &= 2555.27 \text{ MT.} \end{aligned}$$

$$\begin{aligned} \text{No. of order in a year} &= \text{Annual demand} / \text{EOQ} \\ &= 735 / 2555.27 \\ &= 0.2876 \text{ or 1 time.} \end{aligned}$$

From the above EQO calculation, it can be conclude that if the corporation wants to minimize the total cost, then it should be ordered 2555.27 MT of Newsprint. The company has to purchase the newsprint 0.2876 or 1 time in a year.

Item "B": (a) Ink

On the basis of corporation's record book, the following data are available for the input ink.

$$\begin{aligned} \text{Annual Demand (A)} &= 13880 \\ \text{Price per Kg.} &= \text{Rs } 190 \\ \text{Order quantity per order} &= 6000 \text{ kg} \\ \text{Total amount tied up} &= \text{Rs } 190 \times 13880 \text{ kg} \\ &= \text{Rs } 2290200 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed within a year} &= 13880 / 6000 \\ &= 2.31 \text{ or 3 times} \end{aligned}$$

Order cost:

Bank Commission = Rs 11451

Custom Duty = Rs18322

Total order cost per order (O) = Rs29773

Carrying cost:

Storage cost = Rs 19400

Obsolescence charges 2% of the total cost (0.02 x Rs 2290200) = Rs 45804

Total carrying cost = Rs 65204

Carrying cost per Kg (C) = Rs 65204 / 13880

= Rs 4.69

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

In this way,

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 13880 \times 29773) / 4.69 \\ &= 13275 \text{ kg} \end{aligned}$$

No. of order with in a year = Annual demand / EOQ

$$= 13880 / 13275$$

$$= 1.045 \text{ or } 2 \text{ times}$$

Item "B": (b) Film sheet:

Film sheets are very important for the printing process. And such type of materials is purchase regularly in the corporation. The following information is available in the corporation's record book related to the film sheet.

Annual demand (A) = 11000 sheets

Price per meter = Rs 250

Order quantity per order = 6000

Total amount tied up = (Rs 250 x 11000)

$$= \text{Rs } 2750000$$

No. of order placed during the year = 11000 / 6000
1.833 or 2 times

Order cost:

Bank commission	= Rs 13750
Custom duty	= Rs 22000
Labor charge	= <u>Rs 6500</u>
Total ordering cost per order (O)	= <u>Rs 42250</u>

Carrying Costs:

Storage cost	= Rs 17500
Obsolescence charges 2% of the total cost (0.02 x Rs 2750000)	= <u>Rs 55000</u>
Total carrying cost	= <u>Rs 72500</u>
Carrying cost per sheet (C)	= Rs72500 / 11000 = Rs 6.59

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \sqrt{(2AO)/C} \\ &= \sqrt{(2 \times 11000 \times 42250) / 6.59} \\ &= 11876.32 \text{ sheets} \end{aligned}$$

$$\begin{aligned} \text{No. of Order} &= \text{Annual demand} / \text{EOQ} \\ &= 11000 / 11876.32 \\ &= 0.926 \text{ or } 1 \text{ time} \end{aligned}$$

Here, the economic order quantity is 11876.32 sheets. It means the company should order 11876.32 sheets to minimize the total cost of the inventory in an organization. The corporation has to order 1 time to fulfill its requirement of the film sheets

Item "B": (c) Aluminum Sheets:

To produce the different types of newspaper in the organization, first of all it should be print in the aluminum sheet and then only in the paper. Such type of aluminum is needed to purchase in

the organization. On the basis of corporation's record book, the following data are available for the aluminum sheet.

Annual demand (A) = 6500 sheets

P rice per sheet = Rs 320

Order quantity per order = 3200 sheets

Total amount tied up = Rs 320 x 6500
= Rs 2080000

No. of order placed during the year = 6500 / 3200
= 2.03 or 3 times

Order costs:

Bank commission = Rs 16640

Custom Duty = Rs 10400

Labor charge = Rs 6500

Total ordering cost per order (O) = Rs 33540

Carrying costs:

Storage costs = Rs 30500

Obsolescence and charge of the total cost (0.02 x Rs 2080000) = Rs 41600

Total carrying cost per year = Rs 72100

Carrying cost per kg (C) = Rs 72100 / 6500

= Rs 11.09

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \sqrt{(2AO)/C} \\ &= \sqrt{(2 \times 6500 \times 33540) / 11.09} \\ &= 6270.28 \text{ sheets} \end{aligned}$$

No. of order = Annual demand / EOQ

= 6500 / 6270.28

= 1.036 or 2 times

From the above calculation, the economic order quantity is 6270.28 sheets which means if the company order 6270.28 sheets then the company 's total order and carrying cost will be equal, at last the total cost will be minimized.

Item “C” (a) Chemicals:

The corporation used different types of chemical like Fountain solution, blanket fixture, Remover negative, Acetic acid, Paper developer, Phosphorous acid, rubber solution blanket wash solution etc.in the production process. For the chemical it is very difficult to keep the record of each item separately. Therefore, the calculation of the EOQ is quite difficult so that the total annual cost incurred for the chemicals in this corporation for this fiscal year is Rs 775000 approximately.

Item “C” (b) Stationary:

Stationary items have been kept in the “C” categories because it is least important for the production process. Stationary items include such as Pen, Tipex, Pilot Pen, Scale, Rubber, Register, Cello tape, Punching machine, Stapler Pin, Print Roll, and Blade etc.

According to the financial record of the Gorkhapatra Corporation for the fiscal year 2061/062, the total cost for the stationary item is Rs 565000 approximately. The demand for the stationary items is not fixed so that such items are purchased when needed. Therefore, the calculation of the EOQ is difficult in stationary items. So the corporation orders such items in every four months in a year. If any items used rapidly then these items should be ordered frequently. The corporation has to check stationary items in every 3 months to determine of the new order.

EOQ for the fiscal year 2062/2063

Item “A”: Newsprint Paper

To calculation the economic order quantity of “Newsprint Paper” for the fiscal year 2062/2063; following data are available from the corporation’s record:

Annual Demand (A) = 620 MT.

Per order quantity = 400 MT.

Cost per metric ton = Rs 42000

Total amount tied up = Rs 42000 x 620
= Rs 26040000

No. of order placed within a year = 620 / 400
= 1.55 times

Ordering cost:

Fright charge (from Calcutta to Kathmandu) = Rs 4100000

Custom duty = Rs 1302000

Labor charge = Rs 18000

Bank commission = Rs 130200

Total ordering cost per order (O) = Rs 5550200

Carrying Cost:

Jilla Sahakari Sangh limited & national trading corporation = Rs 500000

Insurance = Rs 130200

Obsolescence 1.5% of the total value (0.015 x Rs 26040000) = Rs 390600

Total carrying cost = Rs 1020800

Carrying cost per metric ton (C) = Rs 1020800 / 620

= Rs 1646.45

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 620 \times 5550200) / 1646.45 \\ &= 2044.51 \text{ MT.} \end{aligned}$$

$$\begin{aligned} \text{No. of order in a year} &= \text{Annual demand} / \text{EOQ} \\ &= 620 / 2044.51 \\ &= 0.3032 \text{ or } 1 \text{ time} \end{aligned}$$

From the above EQO calculation, it can be conclude that if the corporation wants to minimize the total cost, then it should be ordered 2044.51 MT. of Newsprint. The company has to purchase the newsprint 0.3032 or 1 time in a year.

Item “B”: (a) Ink

On the basis of corporation’s record book, the following data are available for the input ink.

Annual Demand (A) = 9800 kg

Price per Kg. = Rs 180

Order quantity per order = 3000 kg

$$\begin{aligned} \text{Total amount tied up} &= \text{Rs } 180 \times 9800 \text{ kg} \\ &= \text{Rs } 1764000 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed within a year} &= 9800 / 3000 \\ &= 3.26 \text{ or } 3 \text{ times} \end{aligned}$$

Order cost:

Bank Commission = Rs 8820

Custom Duty = Rs 14112

Total order cost per order = Rs 22932

Carrying cost:

Storage cost = Rs 20300

Obsolescence charges 2% of the total cost (0.02 x Rs 1764000) = Rs 35280

Total carrying cost = Rs 55580

$$\begin{aligned} \text{Carrying cost per Kg (C)} &= \text{Rs } 55580 / 9800 \\ &= \text{Rs } 5.67 \end{aligned}$$

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

In this way,

$$\begin{aligned}
 \text{EOQ} &= (2AO)/C \\
 &= (2 \times 9800 \times 22932) / 5.67 \\
 &= 8903.43 \text{ kg}
 \end{aligned}$$

$$\begin{aligned}
 \text{No. of order} &= \text{Annual demand} / \text{EOQ} \\
 &= 9800 / 8903.43 \\
 &= 1.10 \text{ or } 1 \text{ times}
 \end{aligned}$$

Item "B": (b) Film sheet:

Film sheets are very important for the printing process. And such type of materials is purchase regularly in the corporation. The following information is available in the corporation's record book related to the film sheet.

Annual demand (A) = 12500 sheets

Price per meter = Rs 320

Order quantity per order = 6000 sheets

Total amount tied up = (Rs 320 x 12500)
= Rs 4000000

No. of order placed during the year = 12500 / 6000
= 2.0833 or 3 times

Order cost:

Bank commission = Rs 20000

Custom duty = Rs 32000

Labor charge = Rs 7500

Total ordering cost per order (O) = Rs 59500

Carrying Costs:

Storage cost = Rs 18000

Obsolescence charges 2% of the total cost (0.02 x Rs 4000000) = Rs 80000

Total carrying cost = Rs 98000

Carrying cost per sheet (C) = Rs 98000 / 12500
= Rs 7.84

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \sqrt{(2AO)/C} \\ &= \sqrt{(2 \times 12500 \times 59500) / 7.84} \\ &= 13774.32 \text{ sheets} \end{aligned}$$

No. of Order = Annual demand / EOQ

$$\begin{aligned} &= 12500 / 13774.32 \\ &= 0.907 \text{ or } 1 \text{ time} \end{aligned}$$

Here, the economic order quantity is 13774.32 sheets. It means the company should order 13774.32 sheets to minimize the total cost of the inventory in an organization. The corporation has to order 1 time to fulfill its requirement of the film sheets.

Item “B”: (c) Aluminum Sheets:

To produce the different types of newspaper in the organization, first of all it should be print in the aluminum sheet and then only in the paper. Such type of aluminum is needed to purchase in the organization. On the basis of corporation’s record book, the following data are available for the aluminum sheet.

Annual demand (A) = 7100 sheets

P rice per sheet = Rs 320

Order quantity per order = 3500 sheets

$$\begin{aligned} \text{Total amount tied up} &= \text{Rs } 320 \times 7100 \\ &= \text{Rs } 2272000 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed during the year} &= 7100 / 3500 \\ &= 2.028 \text{ or } 3 \text{ times} \end{aligned}$$

Order costs:

Bank commission	= Rs 18176
Custom Duty	= Rs 11360
Labor charge	= <u>Rs 7000</u>
Total ordering cost per order (O)	= <u>Rs 36536</u>

Carrying costs:

Storage costs	= Rs 32000
Obsolescence and charge of the total cost (0.02 x Rs 2272000)	= <u>Rs 45440</u>
Total carrying cost per year	= <u>Rs 77440</u>
Carrying cost per kg (C)	= Rs 77440 / 7100
	= Rs 10.90

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \sqrt{(2AO)/C} \\ &= \sqrt{(2 \times 7100 \times 36536) / 10.90} \\ &= 6899.08 \text{ sheets} \end{aligned}$$

$$\begin{aligned} \text{No. of order} &= \text{Annual demand} / \text{EOQ} \\ &= 7100 / 6899.08 \\ &= 1.029 \text{ or } 2 \text{ times} \end{aligned}$$

From the above calculation, the economic order quantity is 6899.08 sheets which means if the company order 6899.08 sheets then the company 's total order and carrying cost will be equal, at last the total cost will be minimized.

Item "C" (a) Chemicals:

The corporation used different types of chemical like Fountain solution, blanket fixture, Remover negative, Acetic acid, Paper developer, Phosphorous acid, rubber solution blanket wash solution etc.in the production process. For the chemical it is very difficult to keep the record of each item separately. Therefore, the calculation of the EOQ is quite difficult so that the total annual cost incurred for the chemicals in this corporation for this fiscal year is Rs 850000 approximately.

Item “C” (b) Stationary:

Stationary items have been kept in the “C” categories because it is least important for the production process. Stationary items include such as Pen, Tipex, Pilot Pen, Scale, Rubber, Register, Cello tape, Punching machine, Stapler Pin, Print Roll, and Blade etc.

According to the financial record of the Gorkhapatra Corporation for the fiscal year 2062/063, the total cost for the stationary item is Rs 560000 approximately. The demand for the stationary items is not fixed so that such items are purchased when needed. Therefore, the calculation of the EOQ is difficult in stationary items. So the corporation orders such items in every four months in a year. If any items used rapidly then these items should be ordered frequently. The corporation has to check stationary items in every 3 months to determine of the new order.

EOQ for the fiscal year 2063/2064**Item “A”: *Newsprint Paper***

To calculation the economic order quantity of “Newsprint Paper” for the fiscal year 2063/2064; following data are available from the corporation’s record:

Annual Demand (A) = 900 MT.

Per order quantity = 400 MT

Cost per metric ton = Rs 45000

Total amount tied up = Rs 45000 x 900

= Rs 40500000

No. of order placed within a year = 900 / 400

= 2.25 times

Ordering cost:

Fright charge (from Calcutta to Kathmandu) = Rs 4500000

Custom duty = Rs 2025000

Labor charge = Rs 30000

Bank commission = Rs 2025000

Total ordering cost per order (O) = Rs 8580000

Carrying Cost:

Jilla Sahakari Sangh limited & national trading corporation	= Rs 800000
Insurance	= Rs 202500
Obsolescence 1.5% of the total value (0.015 x Rs 40500000)	= <u>Rs 607500</u>
Total carrying cost	= <u>Rs 1610000</u>
Carrying cost per metric ton (C)	= Rs 1610000 / 900
	= Rs 1788.88

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 900 \times 8580000) / 1788.88 \\ &= 2938.25 \text{ MT.} \end{aligned}$$

$$\begin{aligned} \text{No. of order in a year} &= \text{Annual demand} / \text{EOQ} \\ &= 900 / 2938.25 \\ &= 0.3063 \text{ or 1 time.} \end{aligned}$$

From the above EQO calculation, it can be conclude that if the corporation wants to minimize the total cost, then it should be ordered 2938.25 MT. of Newsprint. The company has to purchase the newsprint 0.3063 or 1 time in a year.

Item "B": (a) Ink

On the basis of corporation's record book, the following data are available for the input ink.

$$\text{Annual Demand (A)} = 9460 \text{ kg}$$

$$\text{Price per Kg.} = \text{Rs } 200$$

$$\text{Order quantity per order} = 3000 \text{ kg}$$

$$\begin{aligned} \text{Total amount tied up} &= \text{Rs } 200 \times 9460 \text{ kg} \\ &= \text{Rs } 1892000 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed within a year} &= 9460 / 3000 \\ &= 3.15 \text{ or 4 times} \end{aligned}$$

Order cost:

Bank Commission	= Rs 9460
Custom Duty	= <u>Rs15136</u>
Total order cost per order	= <u>Rs24596</u>

Carrying cost:

Storage cost	= Rs 21000
Obsolescence charges 2% of the total cost (0.02 x Rs 1892000)	= <u>Rs 37840</u>
Total carrying cost	= <u>Rs 58840</u>
Carrying cost per Kg (C)	= Rs 58840 / 9460
	= Rs 6.21

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

In this way,

$$\begin{aligned} \text{EOQ} &= \frac{(2AO)}{C} \\ &= \frac{(2 \times 9460 \times 24596)}{6.21} \\ &= 8656.59 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{No. of order with in a year} &= \text{Annual demand} / \text{EOQ} \\ &= 9460 / 8656.59 \\ &= 1.09 \text{ or } 2 \text{ times} \end{aligned}$$

Item “B”: (b) Film sheet:

Film sheets are very important for the printing process. And such type of materials is purchase regularly in the corporation. The following information is available in the corporation’s record book related to the film sheet.

$$\begin{aligned} \text{Annual demand (A)} &= 13000 \text{ sheets} \\ \text{Price per meter} &= \text{Rs } 350 \\ \text{Order quantity per order} &= 7000 \text{ sheets} \\ \text{Total amount tied up} &= (\text{Rs } 350 \times 13000) \\ &= \text{Rs } 4550000 \end{aligned}$$

No. of order placed during the year = $13000 / 7000$
= 1.85 or 2 times

Order cost:

Bank commission = Rs 22750
Custom duty = Rs 36400
Labor charge = Rs 8000
Total ordering cost per order (O) = Rs 67150

Carrying Costs:

Storage cost = Rs 20000
Obsolescence charges 2% of the total cost ($0.02 \times \text{Rs } 4550000$) = Rs 91000
Total carrying cost = Rs 111000
Carrying cost per sheet (C) = Rs 111000 / 13000
= Rs 8.53

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \frac{(2AO)}{C} \\ &= \frac{(2 \times 13000 \times 67150)}{8.53} \\ &= 14306.55 \text{ sheets} \end{aligned}$$

No. of Order = Annual demand / EOQ
= $13000 / 14306.55$
= 0.908 or 1 time.

Here, the economic order quantity is 14306.55 sheets. It means the company should order 14306.55 sheets to minimize the total cost of the inventory in an organization. The corporation has to order 1 time to fulfill its requirement of the film sheets.

Item “B”: (c) Aluminum Sheets:

To produce the different types of newspaper in the organization, first of all it should be print in the aluminum sheet and then only in the paper. Such type of aluminum is needed to purchase in

the organization. On the basis of corporation's record book, the following data are available for the aluminum sheet.

Annual demand (A) = 7700 sheets

Price per sheet = Rs 350

Order quantity per order = 3800 sheets

Total amount tied up = Rs 350 x 7700
= Rs 2695000

No. of order placed during the year = $7700 / 3800$
= 2.026 or 3 times

Order costs:

Bank commission = Rs 21560

Custom Duty = Rs 13475

Labor charge = Rs 7800

Total ordering cost per order (O) = Rs 42835

Carrying costs:

Storage costs = Rs 34000

Obsolescence and charge of the total cost (0.02 x Rs 2695000) = Rs 53900

Total carrying cost per year = Rs 87900

Carrying cost per kg (C) = Rs 87900 / 7700

= Rs 11.41

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \sqrt{(2AO)/C} \\ &= \sqrt{(2 \times 7700 \times 36536) / 11.41} \\ &= 7603.55 \text{ sheets} \end{aligned}$$

No. of order = Annual demand / EOQ

= $7700 / 7603.55$

= 1.012 or 2 times

From the above calculation, the economic order quantity is 7603.55 sheets which means if the company order 7603.55 sheets then the company 's total order and carrying cost will be equal, at last the total cost will be minimized.

Item “C” (a) Chemicals:

The corporation used different types of chemical like Fountain solution, blanket fixture, Remover negative, Acetic acid, Paper developer, Phosphorous acid, rubber solution blanket wash solution etc.in the production process. For the chemical it is very difficult to keep the record of each item separately. Therefore, the calculation of the EOQ is quite difficult so that the total annual cost incurred for the chemicals in this corporation for this fiscal year is Rs 845000 approximately.

Item “C” (b) Stationary:

Stationary items have been kept in the “C” categories because it is least important for the production process. Stationary items include such as Pen, Tipex, Pilot Pen, Scale, Rubber, Register, Cello tape, Punching machine, Stapler Pin, Print Roll, and Blade etc.

According to the financial record of the Gorkhapatra Corporation for the fiscal year 2063/064, the total cost for the stationary item is Rs 550000 approximately. The demand for the stationary items is not fixed so that such items are purchased when needed. Therefore, the calculation of the EOQ is difficult in stationary items. So the corporation orders such items in every four months in a year. If any items used rapidly then these items should be ordered frequently. The corporation has to check stationary items in every 3 months to determine of the new order.

EOQ for the fiscal year 2064/2065

Item “A”: Newsprint Paper

To calculate the economic order quantity of “Newsprint Paper” for the fiscal year 2064/2065; following data are available from the corporation’s record:

Annual Demand (A) = 1000 MT.

Per order quantity = 500 MT.

Cost per metric ton = Rs 47000

Total amount tied up = Rs 47000 x 1000
= Rs 47000000

No. of order placed within a year = 1000 / 500
= 2 times

Ordering cost:

Fright charge (from Calcutta to Kathmandu)	= Rs 4650000
Custom duty	= Rs 2250000
Labor charge	= Rs 35000
Bank commission	= <u>Rs 2225000</u>
Total ordering cost per order (O)	= <u>Rs 9160000</u>

Carrying Cost:

Jilla Sahakari Sangh limited & national trading corporation	= Rs 900000
Insurance	= Rs 215000
Obsolescence 1.5% of the total value (0.015 x Rs 47000000)	= <u>Rs 737500</u>
Total carrying cost	= <u>Rs 1852500</u>
Carrying cost per metric ton (C)	= Rs 1852500 / 1000
	= Rs 1852.50

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EOQ) formula:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 1000 \times 9160000) / 1852.50 \\ &= 3144.73 \text{ MT.} \end{aligned}$$

$$\begin{aligned} \text{No. of order in a year} &= \text{Annual demand} / \text{EOQ} \\ &= 1000 / 3144.73 \\ &= 0.3179 \text{ or } 1 \text{ time} \end{aligned}$$

From the above EQO calculation, it can be conclude that if the corporation wants to minimize the total cost, then it should be ordered 3144.73 MT. of Newsprint. The company has to purchase the newsprint 0.3179 or 1 time in a year.

Item “B”: (a) Ink

On the basis of corporation’s record book, the following data are available for the input ink.

Annual Demand (A) = 9750 kg

Price per Kg. = Rs 225

Order quantity per order = 3500 kg

$$\begin{aligned} \text{Total amount tied up} &= \text{Rs } 225 \times 9750 \text{ kg} \\ &= \text{Rs } 2193750 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed within a year} &= 9750 / 3500 \\ &= 2.78 \text{ or } 3 \text{ times} \end{aligned}$$

Order cost:

Bank Commission = Rs 9880

Custom Duty = Rs 16220

Total order cost per order = Rs 26100

Carrying cost:

Storage cost = Rs 22370

Obsolescence charges 2% of the total cost (0.02 x Rs 2193750) = Rs 39215

Total carrying cost = Rs 61585

Carrying cost per Kg (C) = Rs 61585 / 9750

= Rs 6.31

Formula Method:

Now, the above data is putting into the Economic Order Quantity (EQO) formula:

In this way,

$$\begin{aligned}
 \text{EOQ} &= (2AO)/C \\
 &= (2 \times 9750 \times 26100) / 6.31 \\
 &= 8980.96 \text{ kg}
 \end{aligned}$$

$$\begin{aligned}
 \text{No. of order with in a year} &= \text{Annual demand} / \text{EOQ} \\
 &= 9750 / 8980.96 \\
 &= 1.08 \text{ or } 2 \text{ times}
 \end{aligned}$$

Item “B”: (b) Film sheet:

Film sheets are very important for the printing process. And such type of materials is purchase regularly in the corporation. The following information is available in the corporation’s record book related to the film sheet.

Annual demand (A) = 14500 sheets

Price per meter = Rs 385

Order quantity per order = 7500 sheets

Total amount tied up = (Rs 385 x 14500)
= Rs 5582500

No. of order placed during the year = 14500 / 7500
= 1.933 or 2 times

Order cost:

Bank commission = Rs 23840

Custom duty = Rs 37725

Labor charge = Rs 8220

Total ordering cost per order (O) = Rs 69785

Carrying Costs:

Storage cost = Rs 21000

Obsolescence charges 2% of the total cost (0.02 x Rs 5582500) = Rs 91750

Total carrying cost = Rs 112750

$$\begin{aligned} \text{Carrying cost per sheet (C)} &= \text{Rs } 112750 / 14500 \\ &= \text{Rs } 8.67 \end{aligned}$$

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= \sqrt{(2AO)/C} \\ &= \sqrt{(2 \times 14500 \times 69785) / 8.67} \\ &= 15278.14 \text{ sheets} \end{aligned}$$

$$\begin{aligned} \text{No. of Order} &= \text{Annual demand} / \text{EOQ} \\ &= 14500 / 15278.14 \\ &= 0.949 \text{ or } 1 \text{ time} \end{aligned}$$

Here, the economic order quantity is 15278.14 sheets. It means the company should order 15278.14 sheets to minimize the total cost of the inventory in an organization. The corporation has to order 1 time to fulfill its requirement of the film sheets.

Item “B”: (c) Aluminum Sheets:

To produce the different types of newspaper in the organization, first of all it should be print in the aluminum sheet and then only in the paper. Such type of aluminum is needed to purchase in the organization. On the basis of corporation’s record book, the following data are available for the aluminum sheet.

$$\text{Annual demand (A)} = 8100 \text{ sheets}$$

$$\text{P rice per sheet} = \text{Rs } 370$$

$$\text{Order quantity per order} = 4000 \text{ sheets}$$

$$\begin{aligned} \text{Total amount tied up} &= \text{Rs } 370 \times 8100 \\ &= \text{Rs } 2997000 \end{aligned}$$

$$\begin{aligned} \text{No. of order placed during the year} &= 8100 / 4000 \\ &= 2.025 \text{ or } 3 \text{ times} \end{aligned}$$

Order costs:

Bank commission	= Rs 22760
Custom Duty	= Rs 14580
Labor charge	= <u>Rs 8100</u>
Total ordering cost per order (O)	= <u>Rs 45440</u>

Carrying costs:

Storage costs	= Rs 35500
Obsolescence and charge of the total cost (0.02 x Rs 2297000)	= <u>Rs 55800</u>
Total carrying cost per year	= <u>Rs91300</u>
Carrying cost per kg (C)	= Rs 91300 / 8100
	= Rs 11.27

Formula Method:

Calculation of the EOQ:

$$\begin{aligned} \text{EOQ} &= (2AO)/C \\ &= (2 \times 8100 \times 45440) / 11.27 \\ &= 8081.92 \text{ sheets} \end{aligned}$$

No. of order = Annual demand / EOQ

$$\begin{aligned} &= 8100 / 8081.92 \\ &= 1.0022 \text{ or 2 times} \end{aligned}$$

From the above calculation, the economic order quantity is 8081.92 sheets which means if the company order 8081.92 sheets then the company 's total order and carrying cost will be equal, at last the total cost will be minimized.

Item "C" (a) Chemicals:

The corporation used different types of chemical like Fountain solution, blanket fixture, Remover negative, Acetic acid, Paper developer, Phosphorous acid, rubber solution blanket wash solution etc.in the production process. For the chemical it is very difficult to keep the record of each item separately. Therefore, the calculation of the EOQ is quite difficult so that the total annual cost incurred for the chemicals in this corporation for this fiscal year is Rs 845000 approximately.

Item “C” (b) Stationary:

Stationary items have been kept in the “C” categories because it is least important for the production process. Stationary items include such as Pen, Tipex, Pilot Pen, Scale, Rubber, Register, Cello tape, Punching machine, Stapler Pin, Print Roll, and Blade etc.

According to the financial record of the Gorkhapatra Corporation for the fiscal year 2064/065, the total cost for the stationary item is Rs 580000 approximately. The demand for the stationary items is not fixed so that such items are purchased when needed. Therefore, the calculation of the EOQ is difficult in stationary items. So the corporation orders such items in every four months in a year. If any items used rapidly then these items should be ordered frequently. The corporation has to check stationary items in every 3 months to determine of the new order.

4.2 ABC analysis (selective inventory control) system of GPC:

ABC analysis is a widely used classification technique to identify various item of inventory for the purpose of inventory control. In this analysis first of all, inventory are collected and then these inventory are classified in to the A, B& C categories on the basis of their values, usages and the rate etc. Division of the inventory items according to the ABC analysis can be shown in the following table

Category	Classification with description
A	Total value of this item is high but low in quantity level
B	Total value of this item is moderate but medium in quantity level
C	Total value of this item is low but high in quantity level

Table No: 3 Division of the inventory items according to the ABC analysis

Ranking of inventories on the basis of their value (Fiscal Year 2064 / 2065)

S. N	Items	Annual requirements(in unit)	Unit cost(in Rs)	Value (in Rs)	Rank
1	News print	1000	47000	47000000	I
2	Ink	9750	225	2193750	II
3	Film sheets	14500	385	5582500	III
4	Aluminum sheet	8100	370	2997000	IV
5	Chemical	—	—	845000	V
6	Stationary	—	—	580000	VI

Table No: 4 Ranking of inventory

ABC classification of inventories according to cumulative percent of items and cost volume can be presented below:

Rank	S.N	Percentage of items (100 /6)	Cumulative of % items	Cost Volume (in Rs)	Cum.Cost volume (in Rs)	Cum.% of cost volume	Remark
1	1	16.67 %	16.67 %	47000000	47000000	79.39 %	A
2	2	16.67	33.34	5582500	52582500	88.82	B
3	3	16.67	50.01	2997000	55579500	93.88	
4	4	16.67	66.68	2193750	57773250	97.59	
5	5	16.67	83.35	845000	58618250	99.02	C
6	6	16.67	100	580000	59198250	100	

Table No: 5 ABC classification of inventory

From the above table, it is clear that the item first, newsprint has just 16.67% of the inventory but it has 79.39% of the total value of the inventory. So it is kept in “A” category. Similarly, other items (i.e. Rank from 2 to 4) have covered 50.01% of the inventory and its value is 18.19% of the total value of the inventory, and it is kept as “B” category. At last, remaining

items (i.e. Rank from 5 & 6) have covered 33.32% of the inventory value and its value is 2.41% of the total value of the inventory. So it is kept as “C” category.

From the above table, the all inventories are categories as following ways:

Category “A” = *Newsprint.*

Category “B” = *Ink, Film sheet and Aluminum sheet.*

Category “C” = *Chemical and Stationary items*

The above tabular values of ABC categories can be presented by the help of graph:

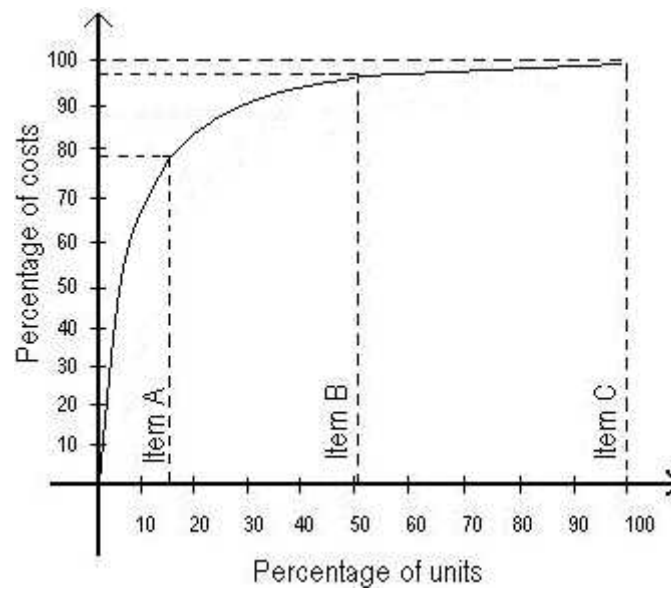


Fig: 6 Graphical Presentation of ABC analysis.

From the above figure, the corporation has classified its inventory such as Newsprint, ink, Aluminum sheets, film sheets. Chemical and stationary items are A, B & C which is defined as previously in the above table. ABC analysis indicates that the high value items should be kept in “A” category, and to pay more attention to such category. Items having middle value are kept in the “B” category and to pay moderate attention to them. In the same way, the items having less value should be kept in the “C” category, and to pay attention in every 3 months in a year. However, all the items are necessary in production process to produce a finished product. Therefore, it should be managed properly in corporation.

4.3 Trend analysis:

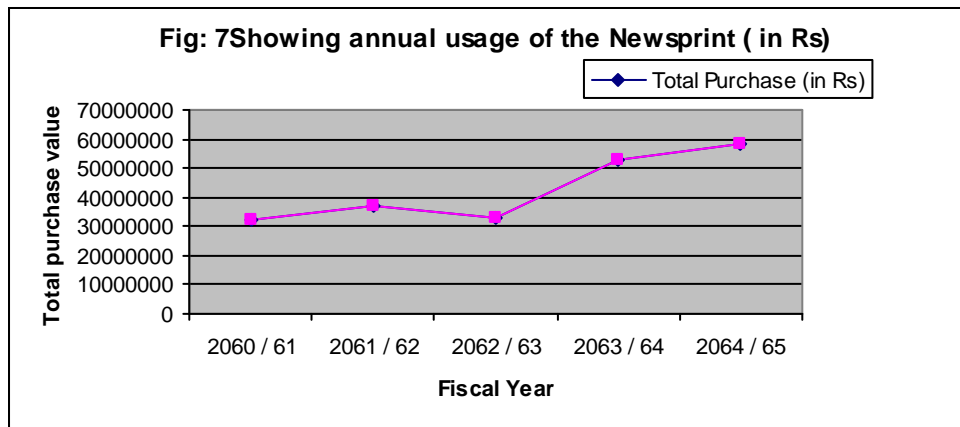
a) Annual usage of the Newsprint:

The annual usage of the Newsprint during the five years (i.e. from 2060 to 2065) can be summarized as in the table form below:

Fiscal Year	Total Purchase (in Rs)	Percentage changes in total purchase
2060 / 2061	32275000	—
2061 / 2062	36928800	14.41%
2062 / 2063	32611000	1.04
2063 / 2064	50690000	57.05
2064 / 2065	58012500	79.74

Table No: 6 Annual usage of the Newsprint:

From the above table it is seemed that the consumption rate of newsprint is more fluctuate during the five years. As from the table, the usage rate of newsprint increase 14.41% in fiscal year 2061 / 62 but it is decreased by 1.04% in fiscal year 2062 / 63. Again it is increased by 57.05% in fiscal year 2063 / 64 from the base year 2060 / 61. The above table can be presented in the following graph:



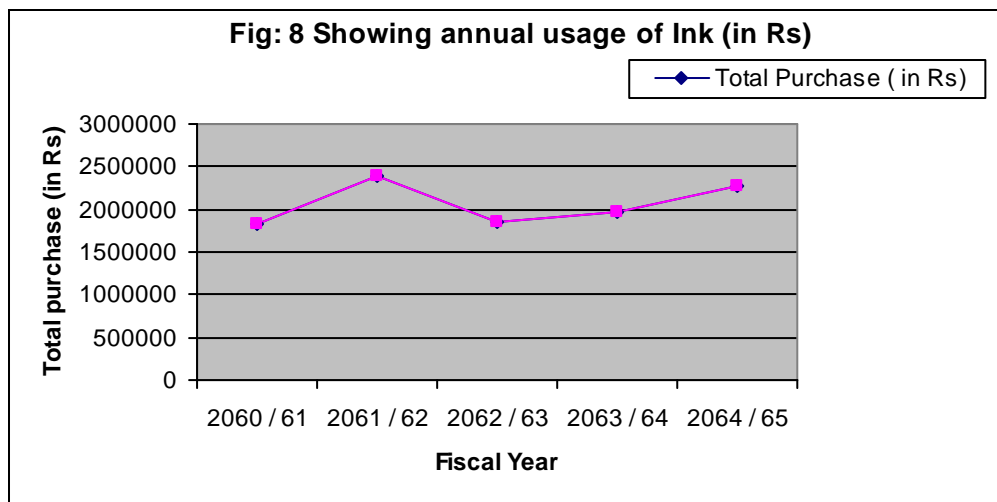
From the above graph, we can see that Gorkhapatra Corporation has fluctuating trend of newsprint. So the corporation has tried to purchase the newsprint on the basis of the planning, and that planning should be done on the basis Economic order quantity which helps to minimize the total cost of the newsprint.

b) Annual usage of the Ink:

Fiscal Year	Total Purchase (in Rs)	Percentage changes in total purchase
2060 / 2061	1834914	—
2061 / 2062	2385177	29.98%
2062 / 2063	1842512	0.41
2063 / 2064	1975436	7.65
2064 / 2065	2281435	24.33

Table No: 7 Annual usage of the Ink:

From the above table it is seemed that the consumption rate of newsprint increase 29.98% in fiscal year 2061 / 62 from the base year 2060 / 61. But it is decreased 0.41% in the fiscal year 2062 / 63 from the base year 2060 / 61. Again in the fiscal year 2064 / 65 the usage rate is increased by 24.33 % from the base year 2060 / 61. The annual usage of the ink during the five years (i.e. from 2060 to 2065) can be summarized as in the table form below:



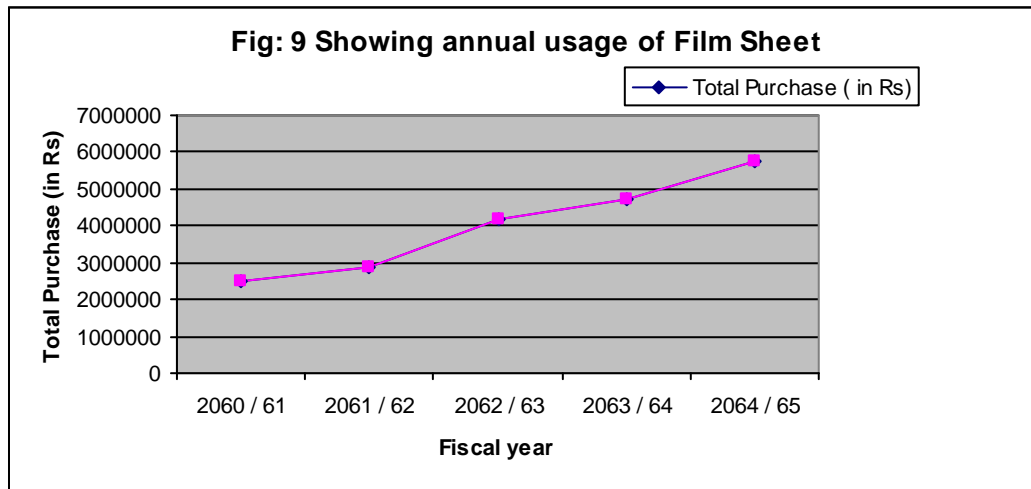
From the above graph, the consumption of the ink is fluctuating during the five years. The corporation has to be scanning the internal environment to reduce the fluctuation of the ink to minimize the total cost of the ink.

c) Annual usage of the Film Sheet:

Fiscal Year	Total Purchase (in Rs)	Percentage changes in total purchase
2060 / 2061	2502400	—
2061 / 2062	2864750	14.48%
2062 / 2063	4157500	6.61
2063 / 2064	4728150	8.89
2064 / 2065	5765035	130.38

Table No: 8 Annual usage of the Film sheet:

The annual usage of the film sheet during the five years (i.e. from 2060 to 2065) can be summarized as in the table form below:



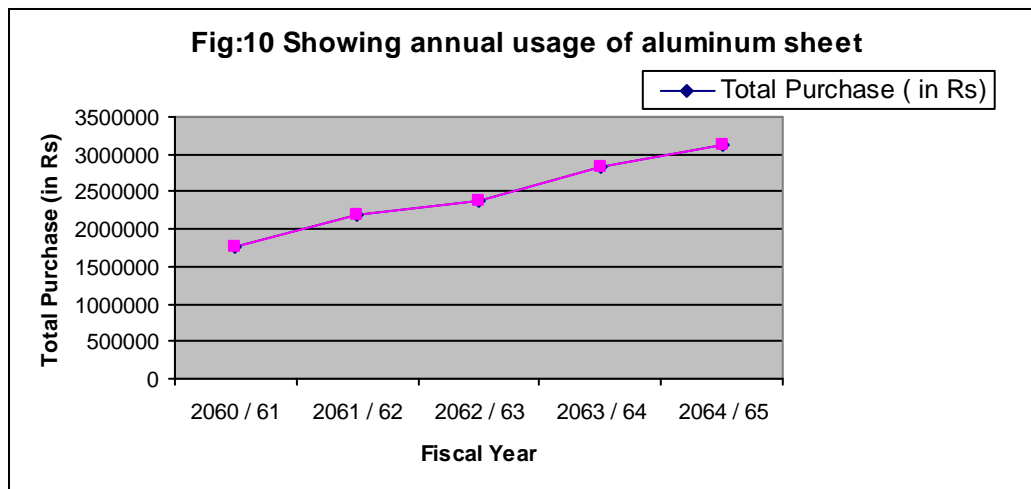
From the above graph, it is found that the corporation has increasing trend in using the film sheets in every fiscal year. Using the high quantity of film sheets is not good for the corporation because it incurred more cost; so it will be better to maintaining optimal level of film sheets in an organization.

a) Annual usage of the Aluminum Sheet:

Fiscal Year	Total Purchase (in Rs)	Percentage changes in total purchase
2060 / 2061	1764242	—
2061 / 2062	2185640	23.88%
2062 / 2063	2385976	35.29
2063 / 2064	2825735	60.16
2064 / 2065	3133740	77.62

Table No: 9 Annual usage of the Aluminum sheet:

The annual usage of the aluminum sheet during the five years (i.e. from 2060 to 2065) can be summarized as in the table form below:



From the above graph, it can be clear that the rate of consumption of aluminum sheets is increasing trend in every fiscal year. Therefore, the company can control its expenses on aluminum sheets by ordering optimal level of inventory.

4.4 Re-order Point (Level):

As a part of operating doctrine, the inventory level at which stock should be reordered. Re-order point gives the answer of the question like when should an order be placed. The Re-order-point of the different inventories can be calculated as follows:

For Newsprint:

Items / FY	2060/61	6061/62	2062/63	2063/64	2064/65
Daily Consumption (MT)	1.91	2.04	1.72	2.5	2.78
Lead time (in days) (360days)	90	90	90	90	90
Re-order Point = Lead time x Daily consumption	172	183.6	154.8	225	250.2

Table No: 10 Re-order point of Newsprint

For Ink:

Items / FY	2060/61	6061/62	2062/63	2063/64	2064/65
Daily Consumption (kg)	32.56	38.56	27.22	26.28	27.08
Lead time (in days) (360days)	30	30	30	30	30
Re-order Point = Lead time x Daily consumption	976.8	1156.8	816.6	788.4	812.4

Table No: 11 Re-order point of Ink

For Film sheet:

Items / FY	2060/61	6061/62	2062/63	2063/64	2064/65
Daily Consumption (sheet)	33.33	30.56	34.72	36.11	40.28
Lead time (in days) (360days)	90	90	90	90	90
Re-order Point = Lead time x Daily consumption	2999.7	2750.4	3124.8	3249.9	3625.2

Table No: 12 Re-order point of film sheet

For Aluminum Sheet:

Items / FY	2060/61	6061/62	2062/63	2063/64	2064/65
Daily Consumption (sheet)	17.22	18.06	19.72	21.39	22.5
Lead time (in days) (360days)	60	60	60	60	60
Re-order Point = Lead time x Daily consumption	1033.2	1083.6	1183.2	1283.4	1350

Table No: 13 Re-order point of Aluminum sheets

From the above table, it can be said that all the necessary inventories have increasing trend of Re-order point during the fiscal year 2060 / 61 to 2064 / 65, it is occur due to the fluctuation in the daily consumption even constant the lead time during the five years.

4.5 Major findings of the Study:

The main findings of the study as revealed in the analysis are briefly presented below:

- The corporation generally purchases the main raw materials from the foreign countries like, Russia, Singapore, India etc, and subsidiary materials from domestic market.
- Corporation has fixed working days in a year but annually usage of material like Newsprint, Ink, Film sheet and Aluminum sheets in the fiscal year 2060/2061 to 2064/65 seems fluctuated more.
- The different method of inventory management technique such as purchase order, economic order quantity, Re- order point etc. are not used properly.
- Corporation has not kept purchasing raw materials committee so that total cost of purchasing is fluctuate more during the fiscal year 2060/61 to 2064/65.
- Corporation has not kept the separate record of ordering and carrying cost. So the calculation of Economic-order-quantity is difficult during the five years.
- Corporation has not got sufficient profit, because of increase trend in total cost. For achieve the sufficient profit, the corporation should apply scientific tools and techniques of inventory management like EOQ, ROL, lead time and ABC analysis to reduce the total cost. But it is not found that the corporation used these tools and techniques.
- ABC analysis planning system is the important system of inventory control for the corporation. This system helps to classifies the all the inventory in term of their value and usages. From this study, corporation has classified all the inventory in the following categorized:
 - Category “A” – Newsprint*
 - Category “B” – Ink, Film sheets and Aluminum sheet*
 - Category “C” – Chemicals and Stationary*
- Corporation has not used full production capacity because of instability of political situation.

- GPC is the first media print organization in Nepal but it is located only in capital and it has no other branches in the remotes area still now.
- Corporation has lack of well trained and skilled manpower to handle the inventory control system. Not only this much, the volatile in political situation, lack of insufficient capital and inflation rate of internal market also influence the inventory management policy.
- Still now, corporation has kept the traditional way of keeping records of inventory management which requires more time, cost and manpower.

CHAPTER – V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary:

As we know that, developing country like Nepal, public enterprises play vital role to achieve the social as well as economic development. Private sectors also play the role of development of the country but especially they focus only on the profit rather than service to the public. Therefore, at such situation public enterprises is only the one medium for the overall and development of the country. Normally, public enterprises are the only one major responsibility body to provide the quality goods and services with low prices and using the scarce resources more effectively at every time. In this context, this study is concerned to evaluate the inventory management tools used by the Gorkhapatra Corporation. For this purpose the researcher has taken the secondary data from the official personnel such as annual report of the GPC, balance sheet, profit and loss account, smarika and other unpublished documents. All the collected data and information are analyzed on the basis of the inventory management theory with the help of economic order quantity, and ABC analysis.

After analysis the researcher has found that the corporation has not used scientific tools and techniques such as economic order quantity, re-order-level, safety stock, lead time, and ABC analysis and so on. Lack of using these tools the corporation will not be able to minimize its total inventory cost.

Therefore, inventory management means to direct the business for the proper handling of the inventory to achieve the target goals within a specified period. For that purpose the corporation should apply the reliable scientific technique and tools such as economic order quantity, safety stock, re-order-level, lead time for the purchasing decision and ABC classification should be used to better control for the inventory management.

5.2 Conclusion:

After the observation and analysis of practice of inventory management tools in GCP, the following conclusion can be drawn:

- GCP is located in the capital and it has not opened the additional branches. The corporation acquired the needed raw materials from the international as well as domestic market according to their necessities.
- By the help of this study, we can say that GCP has still today using the old method of keeping record of inventory rather than using the new technology like computerized system.
- There is no provision to hire expert to manage the inventory system in the corporation. And well qualified and trained personnel are less in numbers to control the inventory according to their values and usage.
- Corporation has not developed to give reward on the basis of work completed in time by the employees.
- The sound co-ordination cannot be effectively maintained between the top level, middle level and lower level management.
- Political instability, economic condition of the country and un-utilization of a full capacity of plant is the main burden to the GCP.
- Corporation has its own objectives, goals and different types of strategy to satisfy the customers but due to the weak in implementation of formulated strategy, the corporation has always failed to meet the target goals.

5.3 Recommendation:

Sound inventory management system is necessary for the better performance of the corporation. From the above analysis of data, some findings are extracted, so based on these findings; it may appropriate to draw some suggestions and recommendations. Although these suggestions may not enough as well as could easily giving negative reflection but it is hoped that these suggestions will surely improve the inventory management of the corporation.

- The main objectives of the inventory management are to maintained optimal level of inventory. So to keep optimal level of inventory in the corporation has to follow the standard tools such as EOQ model, re-order level, safety stock etc. should be determined.
- Raw materials (inventory) should be purchased from the local market rather than foreign market.
- Reliable suppliers as well as effective transportation agencies should be selected.
- Corporation should keep well experienced and qualified personnel to manage the inventory system.
- ABC analysis should be brought into fully use. This is scientific and most applicable method to control inventory on the basis of their value and usage. For media corporation, ABC analysis system helpful to keep inventories in the proper place, which helps to maintain quality of the product and we can easily find the inventory where they required.
- Fully authority should be given to the concern department within the corporation and unnecessary central intervention must be avoided. Sound co-ordination should be established within the corporation.
- Safety stock should be maintained at optimal level because of the following reasons:
 - i) Demand fluctuate in the market
 - ii) Availability of the raw materials
 - iii) Financial capacity
- Effort should be made to used computers and competent personnel to handle it is order to keep the records of inventory and such system helps to solve the problem of inventory control.
- The actual EOQ of the corporation in all fiscal study period is bigger than calculated EOQ, so it means the corporation has not focus on the EOQ model which increases the total inventory cost.

BIBLIOGRAPHY

- Adam, Evertt. (1993), **Production and Operation Management**, New Delhi: Prentice Hall of India Pvt. Ltd.
- Agrawal, Govinda Ram. (1975), **Inventory Management Concept and Technique**, Lalitpur: Prashasan Byavasthabibhag.
- Agrawal, Govinda Ram. (1980), **Inventory Management in Nepal**, Kathmandu: CEDA, Tribhuvan University.
- B. P. Lingaraj, R. Balacubramanian, T. V. Krishnamurthy (1983) **An Inventory Managemnt and Information System for Aircraft Production**, Informs Publication.
- Bajracharya, P. (1983), **Management Problems in Public Manufacturing Company in Nepal**, Kathmandu: CEDA, T.U.
- Baral, Puspa Raj. (1994), "Inventory Management: A case Study of Gandaki Noodles Pvt. Ltd." An Unpublished Master's Degree thesis, Central Department of Management T.U.
- Bollten, SE (1975), **Managerial Finance**, Houghton Miffling Co. Boston.
- Dahal, P.P (2005), "A Comparative Study on Inventory Management of Dabur Nepal Pvt. Ltd. and Nepal Level Ltd." An Unpublished Master's Degree thesis, Central Department of Management T.U.
- Gautam, Vibhas. (2001), "A case Study On inventory Management of Nepal Oil Corporation Ltd." An Unpublished Master's Degree thesis, Central Department of Management T.U.
- Geol, B.S. (1985), **Production and Operation Management**, First Edition. Pragati Prakashan, Meerut.
- Gorkhapatra Corporation (2005), **A Brief Introduction of Gorkhapatra Corporation**.
- Handling G. and Within T.M. (1995), **Analysis of Inventory system**, Eaglewood Diff's Jew's Jery printer Hall. Hang Narayan Limbu (2007), "Inventory Management, A case study of salt trading corporation." An Unpublished Master's Degree thesis, Central Department of Management T.U.
- Horne, James C Van, P.K. (1992), **Financial Management**, Tata MC GrawHill Publishing New Delhi.
- Jain, S.P. and K.L. Narang. (1991) **Cost Accounting**. New Delhi: Kalyani Publishers.
- Joshi, S (1993), **Public Enterprises management**, Kathmandu: Taleju Prakashan.

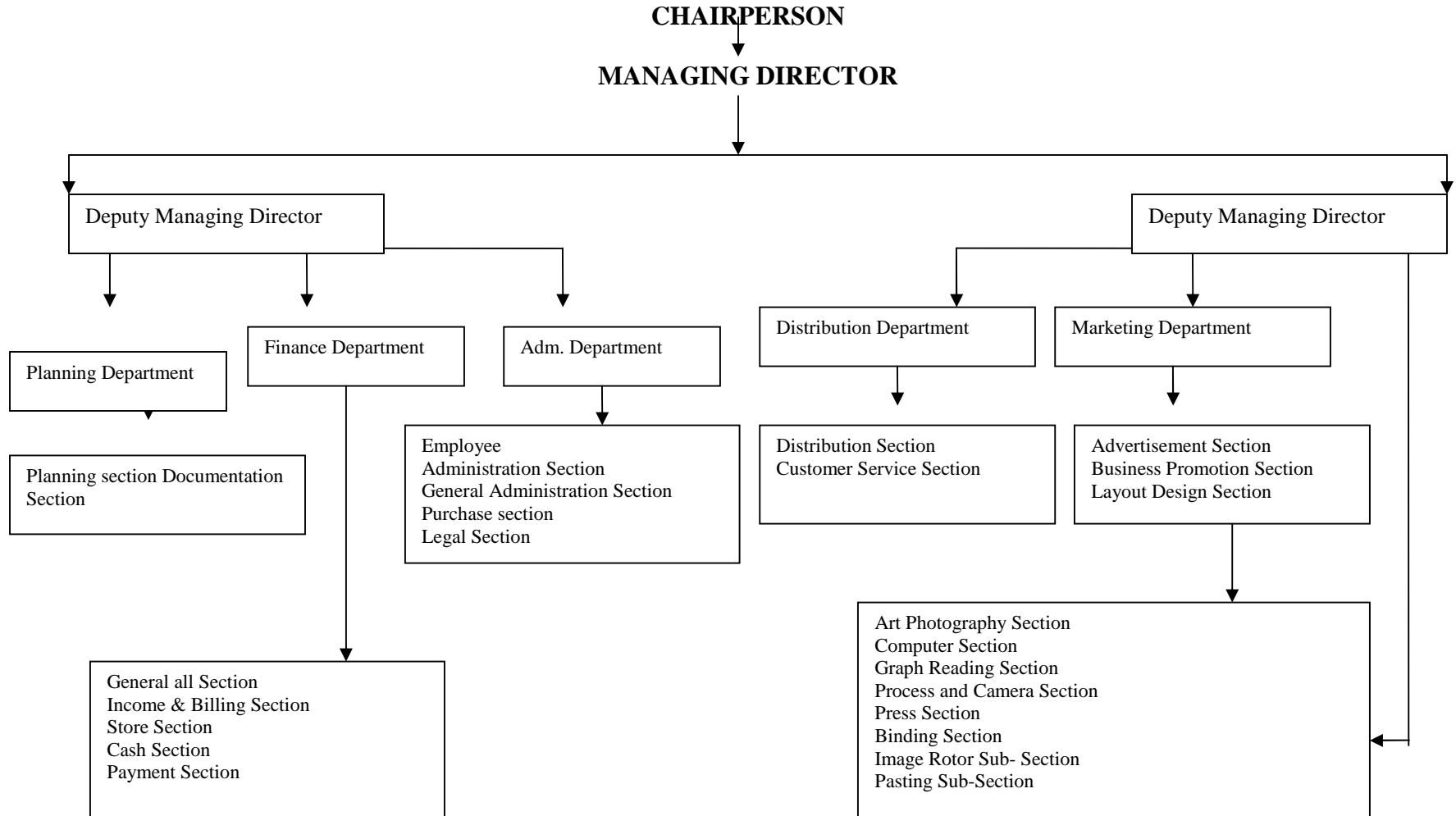
- KC, Prakash (2008), “Comparative Study on Inventory Management: A Case study of Dabur Nepal and Unilever Nepal Ltd.”, An Unpublished Master’s Degree thesis, Central Department of Management T.U.
- Kothri, C.R. (1989), **Research Methodology (Method and Techniques)**, New Delhi: Wisely Eastern Limited.
- Levis, J Range (1975), **Management Finance**, Prentice Hall of India Pvt. Ltd.
- Louis, M Killen (1979), **Technique and Inventory Management**, American Management Association, New York.
- Nair, R.K., A.k. Banjaree and V.K. Agrawal (1998), **Production Management**, Meerut: Pragati Prakashan.
- Niraula, I.M. (1990), “Financial Management in Dairy Development Corporation” (Baratnagar Branch) An Unpublished Master’s Degree thesis, Central Department of Management T.U.
- Pandey, I.M. (1990) **Financial Management**, Vikash Publishing House Pvt. Ltd. New Delhi.
- Richmond, Herbert J. (March 1969), **Effective Inventory Management**, Facts or Fiction, Financial Executive.
- Solemn, Ezra (1995), **Theory of Financial Management**, American Management Association, New York.
- Stan, Martin K and David, W. Miller (1962), **Inventory Control**, theory and Practice Englewood Cliffs, N.J. Prentice hall, New Delhi.
- Uppahadya, Saroj Prasad (2005), “Inventory Management System Applied by Kantipur Publications”, An Unpublished Master’s Degree thesis, Central Department of Management T.U.
- Western, J Fred and Copeland, E. Thomas. (1982), **Managerial Finance**. India: The Dryden Press.
- Wolf, H.K. and plant, P.R (2002), **Social Science Research and Thesis Writing**, 3rd Edition, Buddha Academic Enterprises Pvt. Ltd.
- Yadav, Surendra Prasad (1999), “Inventory Management of Manufacturing Public Enterprises”, A case Study of Janakpur Cigarette Factory Ltd, An Unpublished Master’s Degree thesis, Central Department of Management T.U.

www.jstor.org/stable/170382

www.jstor.org/stable/25060471

APPENDIX – I

ORGANIZATION CHART OF THE GORKHAPATRA CORPORATION



APPENDIX – II

PUBLICATION / PRODUCTION PROCESS

