



**ST. MARY'S UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**ASSESSMENT ON INVENTORY MANAGEMENT AND STOCK CONTROL  
PRACTICES: THE CASE OF ETHIOPIAN ELECTRIC UTILITY, ADDIS  
ABABA REGIONS**

**BY: LEMMA GIRMA**

**MAY, 2016  
ADDIS ABABA, ETHIOPIA**

**ASSESSMENT ON INVENTORY MANAGEMENT AND STOCK  
CONTROL PRACTICES: THE CASE OF ETHIOPIAN ELECTRIC  
UTILITY, ADDIS ABABA REGIONS**

**BY: LEMMA GIRMA**

**ID NO: SGS/0473/2007A**

**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY,  
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## **List of Abbreviations and Acronyms**

MoFED	Ministry of Finance and Economic Development
PPIAF	Public Private Infrastructure Advisory Facility
EELPA	Ethiopian Electric Light and Power Authority
EEPCO	Ethiopian Electric Power Corporation
MRP	Material Requirement Planning
EOQ	Economic Order Quantity
ABC	Always Better Control
VED	Vital Essential Desirable
SDE	Scarce Difficulty Easy HML
HML	High Medium Low
FNSD	Fast moving Normal Slow Dead S
RFID	Radio Frequency Identification
SRV	Store Receiving Voucher
SIV	Store Issue Voucher
STV	Store Transfer Voucher
MTN	Material Transfer Note
n . d	no date

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## **Abstract**

*As stocks are a substantial portion of the assets of organizations, they can (and should) be seen as a potential factor in the optimization of public resources used, and in cost reduction. The inventory management aims to optimize the investment by maintaining adequate and satisfactory levels of materials capable of meeting the needs of customers . This study assess the current practice of inventory management and control, evaluate the inventory and stock control handing tools, examine the contributions of inventory management practices, assess inventory controlling practices, evaluate the existing warehouse policy and procedure that guides the flow of activities, and identify problems those influence the inventory management and control practices in the company. Descriptive research design was employed in this study. Interview and observation were used for further assessment. The target population of the study which directly related to the issues under discussion was 96 staff employees and 4 managers. Using purposive sampling, 24 staff employees from EEU –Gofa Central Store and 72 staff employees from Addis Ababa regions, were selected as a sample for the study. The key findings of the study revealed that: Weak management and leadership traditions; Lack of competency, knowledge, skill, and experiences; Absence of computer utilization and appropriate technologies; Attempting and focusing to accomplish personal needs rather than company goals and objectives; Absence of assessment and monitoring practices and lack of understanding the real situation of inventory management and control of the company; absence of timely used work manual. The study concluded that inventory management is the backbone to the success and growth of the company. Therefore, it was recommended that improving human resources management; purchasing, store and warehouse management of the company; utilizing modern technologies; conducting training and development programs for employees and managers; developing practicable work manual of the company.*

**Key words:** *Inventory, Inventory Management, Stock Control.*

# CHAPTER ONE: INTRODUCTION

## 1.1. Background of the Study

Inventory is an idle resource possessing economic value, which is kept for future use. The inventory management is regarded as a key element for the reduction and control of total costs and improvement of the level of service provided by the companies. The area plays very important role in the overall cost of operations and supply chain of any business big or small. Inventory management system is the main activity for most businesses industry. When we come to state owned monopoly public service Company, inventory management becomes wide, because in monopoly public service Company there are at last varieties of inventories in greater quantities. These make managing inventory investment hard and difficult, (Turrioni, n .d).

Materials management is concerned basically with planning and control of materials. Control is a process by which events are made to conform to a plan. Therefore to control materials, there must be a store, where to buy, when to buy, and how much to buy. The items to be stored will be dictated by the basic functions of the firm and the customers it serves. The suppliers to be selected will be influenced by such factors as the ability of the supplier to supply the quantity of the right quality at the right time and at the right price (right from the point of view of the purchaser).

Whether it is a private or public sector, the acquisition, storage, issuance, and usage of stock in the running of the business must be involved. For effectiveness, efficiency and Productivity of the business, therefore, functional machinery should be put in place for the proper control of stock or inventory of the organization, (Abdul, 2003: pp19-20).

Because inventory is usually one of the biggest numbers on their balance sheet, effective inventory control and management is a vital function to help insure the continued success of distribution and manufacturing and companies. The effectiveness of inventory control is typically measured by how successful a company is at reducing inventory investment, meeting its customer service goals, and achieving maximum throughput and cost containment, (Saga, 2013). On paper, the concept of inventory management seems easy enough. In simple terms, it can be summed up as the process of determining what

Items to stock, how many of each item should be kept on hand, and when orders should be placed for more. Unfortunately, inventory management is much more complex in practice and the factors that complicate the process are conflicting objectives across various segments of each company, and the tentative nature of both supply and demand. (Saga, 2013).

The inventory management aims to optimize the investment by maintaining adequate and satisfactory levels of materials capable of meeting the needs of customers. To meet these goal managers need to find the best answer to such questions; how much to order? And when? To do so they must deal with the trade-off between the pursuits of cost minimization, while they are seeking the satisfaction of service levels. In addition to this trade-off, with the increasing number of items with different demand patterns and characteristics, complexity increases in material management. Thus, researchers and managers must also deal with the challenges of considering the particularities of each material, and manage the different sources of uncertainty. Moreover, the government sector needs more efficient inventory controls, (Turrioni, n .d).

In this context, present materials classification to their characteristics is of utmost importance for more efficient and effective inventory management. To provide the desired level of constructive services to clients, achieving cost efficient operation and minimizing inventory investment are the main objective of inventory management system (John, 1998).

A public utility is defined here as an organization that is majority owned and controlled by government and could consist of number of different forms, some of which may be undistinguished from the government unit that they may be part of. Everybody sees a public property as a national cake, which belongs to all and which body must benefit from whether or not they have authority to use. Besides, public property does not belong to anybody. Thus, there exists the laissez-faire and lackadaisical attitude towards public property. Coupled with this there is also the problem of proper management and control of stock. These are some of the problems confronting the economies of the world. Successful public

utilities are still the exception, however, and since most people in developing countries are under the jurisdiction of public utilities, much of the world's population is still not adequately served. Many utilities find themselves locked in a vicious cycle from which it is difficult to escape (Skyetek Inc., 2014). This spiral combines weak performance incentives, low willingness of customers to pay cost recovery tariffs, and insufficient funding for maintenance, ultimately leading to a deterioration of assets and a squandering of financial resources. The vicious spiral is largely a consequence of ineffective and misdirected policies, coupled with the monopolistic nature of the sector.

So, to achieve these objectives, especially in public service Company, having sound management and control system on inventory investment is essential. Therefore, this research was designed to assessment of Inventory Management and Stock Control practices in Ethiopian Electric Utility- Addis Ababa Regions.

The pertaining activities of Ethiopian Electric Utility are on electric work. The research included the total inventory management and control practices of Ethiopian Electric Utility and tries to address some of the problems related to the inventory management by reviewing practices and procedures of related books that will be gathered from different publication.

## **1.2. Background of the Organization**

Electric power was introduced to Ethiopia in the late 19<sup>th</sup> century, during the regime of Minilik. He got constructed the first hydro power plant on Akaki river in the year 1912 in order to supply power to the small factories that had been established in Addis Ababa. Consequently, the power supply that had been limited to small factories and the place was extended to public places and major roads in the vicinity of the place. In the year 1948, an organization that had been vested with the power to administer the enemy property was evolved to year 1948; an organization that had been vested with the power to Administer the enemy property was evolved to an organization called Showa Electric Power. The new organization although with limited capacity, managed to increase the power supply not only in Showa, but also other administrative regions. In lights of

its functions, its name was changed to Ethiopian Electric Light and Power|| in the year 1955; and after eight months its name was changed to the Ethiopian Electric Light and Power Authority|| (EELPA). The newly established authority was conferred with the powers and duties of the previous one.

In light of the socio economic development of the country, the authority continued to increase the scope of its operation in order to accommodate new changes. After being in operation for about 50 years in this manner, major changes in the objectives and structural setup of the organization took place relative to the changes in the socio economic conditions of the country. In this regard, one of the major changes in the economic sector was transformation of the centralized command economy to the free market driven economy in the year 1987. In order to accommodate the new changes in the environment, the Ethiopian Electric Light and Power Authority was transformed to the Ethiopian Electric Power Corporation by recognizing its functions on the basis of the principles of commercialization and decentralization. Accordingly, the Ethiopian Electric Power Corporation as public enterprise was established for indefinite duration by regulation No 18/1997, under the Public Enterprise Act of 1992. Currently, the power sector of the country is operated by the Ethiopian Electric Power Corporation (EEPCO). It is responsible for the generation, transmission, distribution and sales of electricity nationwide, (EEU; 50<sup>th</sup> Golden jubilee, p33-34).

As per the information from public relation of the company, after it has been serving for years, in 2014, the Ethiopian Electric Power Corporation is divided in to two separate companies namely; Ethiopian Electric Utility and Ethiopian Electric Power. While Ethiopian Electric Power is responsible for the generation and transmission of electricity nationwide, Ethiopian Electric Utility is responsible for the distribution and sales of electricity nationwide. Currently the annual electricity production capacity of the utility is about 2400 MW and the number of customers is more than 1.3 million. The utility has been increasing the number of customers' by more than 20% annually. The utility has a plan to increase the power generation capacity to 10000 MW by 2017. To achieve this plan, the government is constructing mega hydro, wind and geothermal electric power generation plants in different parts of the country.

### **1.3. Statement of the Problem**

Inventory management and control practices cover a wide range of activities in state owned monopoly public service company, because this control practice starts from the purchase of electric materials and continues up to the finished of electric works. Through all these processes inventory management and control practice is very essential. At every process there are many documents that must be adequately authorized, independently checked, prepared, and transferred to the next process. Different departments are involved in each step. Each department has its own duties and responsibilities and they must have qualified trained personnel. According to Toomey (2000), the ultimate aim of inventory is to serve the customer, (Thogori M. & Dr. Jane Gathenya, 2014). Many business organizations the world over have not given stock control the prominence it deserves in spite of its varied importance. However, stock control began to gain recognition as a result of the industrial revolution that swept the advanced countries of America and Europe in the 1930s. The revolution resulted into the scarcity of materials. Industrialist, therefore, had to learn how to control and manage the few available materials. In spite of this effort, and even with abundance of resources (materials), many business organizations are still having the problems of proper management and control of the large stock of inventory held in their stores. The problem of stock control may be attributable to the failure, on the part of the top management officials, to give a deserved attention to the function of stores as well as their inability to employ the services of as well qualified stores officer to take charge of stores supervision and management. Added to this problem is the issue of the dearth of storage facilities and the habit of stores procedure violation by the top, the middle, and the junior cadre personnel's in the organization. Inventories bear a huge amount of money that determines the company's overall cost structure as well as its profitability. If the stock is controlled inefficiently it can cause high storage cost, obsolescence and reduction in working capital. In general the possible cause for poor inventory management practices are overstocking, under stocking, bad issuing system and absence of stock taking.

The Ethiopian Electric Utility (EEU) does not exist in isolation. The same problem as faced by other organizations both public and private is what EEU is facing. More so, being a government organization which is not grounded on the principles of profit

maximization, the neglect as well as the improper care, control and management of stock can be more terrible than required. As per the information from operation department of the utility, the possible cause for poor inventory management and control practices of Ethiopian Electric utility in particular are , currency, scarcity of materials, unethical practice of employees, absence of transparency between employees and management with regard to procurement, less quality of materials, absence of regular training to employees, especially when new technology is introduced, less monitoring of employees while operating in the field and absence of regular maintenance of electric materials. These lead to the major problems of inventory management and control of the company, which were associated with: Management and leadership practices of the company; Employment and workforce situation; Storage and warehouse state of affairs; Purchase requests and purchasing practices. As a result the company's stores are overcrowded making the work of a store-keeper difficult, late issue of materials to the department and these in turn result into poor inventory service delivery .

Nowadays, public sectors play a major role as service rendering firms. One of the major factors that play vital role in the day to day activity of the people is electric power service. Unless this sector is organized and managed in proper way in order to give quality service effectively, it has its own negative impact on future success of the company, living condition of the people, as well as the development of the nation.

Yet with all of these complications to consider, inventory control and management still fundamentally amounts to walking a fine line between meeting customer needs and stocking the least amount of inventory possible. Because inventory is the lifeblood of the sales and production processes, it's important to stock enough of it to avoid paying the opportunity costs of lost sales and diminished customer satisfaction and loyalty. But because inventory is expensive, it's important to stock leaner quantities of it to avoid paying carrying costs like taxes, insurance, security, and storage and to avoid paying the opportunity cost of unavailable working capital. To repeat, inventory is generally one of the biggest assets on a company balance sheet.

To rectify all these, one of the major determinant factors is availability of sufficient materials .So inventory management and control practice must be designed to meet the new change in market demand and support the company's strategic plan.



Thus, without adequate inventory management and stock control practice, Ethiopian Electric Utility doesn't effectively and efficiently manage the flow of materials, utilize people and equipment in the production process, coordinate internal activities and communicate with different company work- groups.

Ethiopian Electric Utility, as a state owned monopoly public service Company in the country, purchases different types of electric materials from external and internal sources, as a result a huge amount of materials flow in the company. That is why inventory and stock control practice is not easy for logistics department. Accordingly, the company designs different mechanisms and procedures to control in flow and out flow of materials. However there is a gap in controlling inventory and utilization of especially electrical materials.

Nevertheless, there were very few assessment results and information that answer a question; what was the practice of the company with regard to inventory management and stock control? This means the company is lacking clear information on the practices of planning, acquiring, storing, transferring, and controlling electric materials (supplies, goods processed for use) in order to optimize all company resources that provide services consistent with company mission and policy. Thus, it was the intension of this study, to investigate the practices of inventory management and control practice of the company. It was designed to provide reasonable suggestions that help to improve the practices of inventory management and stock control.

#### **1.4. Basic Research Question**

The focus of the research was to get reliable answer to the following basic study questions.

1. What is the current practice of inventory management in the utility?
2. How much resources and facilities are sufficiently fulfilled for inventory management department of the utility?
3. How the inventory management practice enables proper utilization of resource and materials in the utility?
4. How the company utilizes appropriate practices to control malpractices in managing its inventories?

5. Is there any warehouse policy and procedure that guides the supply chain /flow of activities in the utility?
6. What are the main determining factors/challenges that influence proper inventory management and stock control practices in the utility?

## **1.5. Objective of the Study**

### **1.5.1. General Objective**

The major objective of this study was to investigate the general inventory management and stock control practices of EEU – Addis Ababa Regions.

### **1.5.2. Specific Objective**

- To assess the current practice of inventory management in the company.
- To evaluate the inventory and stock control handing tools of the company.
- To examine the contributions of inventory management practices of the company.
- To assess inventory controlling practices of the company.
- To evaluate the existing warehouse policy and procedure that guides inventory management and control activities.
- To identify factors those influence the inventory management and control practices in the company.

## **1.6. Definitions and Terms of Concepts**

**Inventory:** Inventory is an idle resource possessing economic value, which is kept for future use. It is all the money that the system has invested in purchasing things if it tends to sell (George 1998). According to the Merriam-Webster Dictionary, Inventory is defined as, the quantity of goods or materials on hand.|| Inventories are basically stocks of resources held for the purpose of future production and/or sales. Inventories may be viewed as an idle resource which has an economic value, (Ukpere 2014; January: 110)

**Inventory Management:** A systematic approach to plan, acquire, store, move and control materials(raw materials, supplies, work in process, and semi finished goods) in order to optimize all company resources and provide services consistent with company policy, (Turrioni, n.d).

**Inventory Control:** Is as a systematic controlling and regulation of purchase, storage and usage of materials in such a way so as to maintain an event flow of production, at the same time avoiding excessive investment in inventories, (Android 1998).

Inventory control is the supply of goods and services at the right time with the right quality and quantity. Inventory control means availability of materials whenever and wherever required by stocking adequate number and kind of stocks, (Ukpere, 2014).

### **1.7. Significance of the Study**

The issue of management of stock is of vital importance to the success of any organization and is one of the serious determinants of the continuity and efficient productivity of the organization. So taking this in to consideration the researcher believes that, it will provide possible solutions for the existing problems on inventory management and stock control practice of Ethiopian Electric Utility; it will narrow the gap between inventory and service provision, because of its advanced inventory management and stock control practice; it will serve as a framework for discussion of future refinement between material management department and warehousing officers, it will be used as an initiation for a further and a wider study in the area of inventory management and stock control.

In general, it is hoped that on the completion the study will be significant as it will provide further insights into the understanding of stock control measures. Though using EEU as a reference point, the study will make an interesting contribution to inventory management and stock control practice in other public utilities. Also, the study will further justify the need to strengthen management and control of stock with anticipated benefit in view. In addition to helping the public utility sector in taking serious decisions on management of stock, it will also serve the interest of the private sector business organizations as well as the general public as a source of enlightenment since it will enlarge the existing literature on management of stock.

## **1.8. Scope/Delimitation of the Study/**

### **1.8.1. Content scope**

As it is previously mentioned, the aim of this research is to make the assessment on inventory related problems. So, the scope of this research study were delimited to the assessment of inventory management and stock control practices, that is inventory management is a systematic approach to plan, acquire, store, move and control materials in such a way so as to maintain an event flow of operation, at the same time avoiding excessive investment in inventories in order to optimize all company resources and provide services consistent with company policy. Inventory is the operating item and it has a relation with all parts of the organization. In this case, by making the initial and destination point on the inventory or warehouse section, this research was only confined to Finance, Administration, Logistic and Purchasing, Operation department, and store user of the company.

### **1.8.2. Geographic Scope**

There are 15 regions in Ethiopian Electric Utility. Due to time and resource limitation, the study was delimited to the 4 Addis Ababa Regions located in the city of Addis; namely North Addis Ababa Regions, South Addis Ababa Regions, East Addis Ababa Regions, and West Addis Ababa Regions .There are 29 district service centers under these four regions located only in the city of Addis Ababa, among these 22 were selected as a sample for the study. As the mainstream of Addis Ababa Regions favor Gofa Central Warehouse, it was included for the study. Furthermore, EEU- Gofa Central Warehouse is a centralized store and gives a nation wise service, so there are varieties of electrical materials including fuel and as a result a huge amount of materials flow in the store. In general, the study was conducted at EEU- Addis Ababa Regions (including their respective district centers) located at different areas in the city of Addis and EEU-Gofa Central Warehouse located at Gofa. Thus the researcher collected information through observation and administering questionnaire to the target respondents (management staffs and workers) of the company.

Heads the departments of Purchasing, finance, operation and Material Management, available at Ethiopian Electric Utility- Head Office located Addis Ababa, were included in the interview for the study and that the researcher was collected information through interview from these officials regarding the issues under discussion.

## CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

### 2.1. The concepts of inventory management

Inventory is an idle resource possessing economic value, which is kept for future use. It is all the money that the system has invested in purchasing things if it tends to sell, (George 1998). Arnold (1998) on his part defined inventory management as a systematic control and regulation of purchase, storage and usage of materials in such a way so as to maintain an even flow of production at the same time avoiding excessive investment in inventories. Efficient materials control cuts out losses and wastes of materials that otherwise pass unnoticed. In short, the inventory control system is a database used to describe in detail the products of a company.

According to Arnold (1998), organizations may hold inventories with the various motives as stated below.

**A. Economies of scale:** This means that it could be economical to produce a relatively large number of items in each production run and store them for future use. This allows the firm amortizes fixed set up costs over a large number of units.

**B. Uncertainties:** Uncertainties often plays major role in motivating and firm to store in inventories. Uncertainty of external demand is the most common. For example, a retailer stocks different items so that he/she can be responsive to consumer preferences. If a customer requests an item that is not available immediately, it is likely that the customer will go elsewhere. Worse, the customer may never return Inventory provides a buffer against the uncertainty of demand. Other uncertainties provide a motivation for holding inventories as well. One is the uncertainty of the lead-time. Lead-time is defined as the amount of time that elapses from the point that an order is placed until it arrives. In the production-planning Context, interpreted the lead-time as the time required to produce the item. A third significant source of uncertainty is the supply. The OPEC oil embargo of the late 1970's is an example of the chaos that can result when supply lines are threatened.

**C. Speculation:** If the value of an item or natural resource is expected to increase, it may be more economical to purchase large quantities at current price and store the items for

future use than to pay the higher price at a future date. For example, silver is required. For the production of photographic film So by correctly anticipating a major price increase in silver, a major producer of photographic film, such as Kodak, could purchase store, large quantities of silver in advance of the increase and realize substantial savings.

**D. Transportation:** In-transit or pipeline inventories exist because transportation times are positive. When transportation times are long, as is the case when transporting Oil from the Middle East to the United States, the investment in pipelines inventories can be substantial . One of the disadvantages of producing Overseas is the increased transportation time and hence the increase in pipeline inventories.

**E. Smoothing:** Change in the demand pattern for a product can be deterministic or random. Seasonality is an example of a deterministic variation. While unanticipated change in economic conditions can result in random variations. Producing and storing inventory in anticipation of peak demand can help to alleviate the disruptions caused by changing production rates and work force levels.

**F. Logistics:** We use the term logistics to describe the reasons for holding inventory different from those outlined above. Certain constraints can arise in the purchasing, production, distribution of items that force the system to maintain inventory. One such case is an item that must be purchased in minimum quantities. Another is the logistic of manufacture; it is virtually impossible to reduce all inventories to zero and expect any continuity in a manufacturing process.

In general Inventory Management system can provides information to efficiently manage the flow of materials, utilize people and equipment, coordinate internal activities, and communicate with customers. Inventory Management and the activities of Inventory Control do not make decisions or manage operations; they provide the information to Managers who make more accurate and timely decisions to manage their operations, (John, 1996).

### 2.1.1. Types of Inventory

Inventory may be classified as: Raw materials, Work in process, Finished Goods and Supplies inventory, (Arnold, 1998).

- i. Raw materials: The purchased items or extracted materials that are transformed into components or products. These are the resources required in the production or processing activity of the firm.
- ii. Work-in-process: item that is in some stage of completion in the manufacturing process.
- iii. Finished goods: Completed products that will be delivered to customers.
- iv. Distribution inventory: This includes finished goods and spare parts that are at various points in the distribution system.
- v. Supplies (often called Maintenance, repair, and operational inventory): Items that are used in manufacturing but do not become part of the finished product are classified as such types of inventory.

Thus an efficient system of material control should be comprehensive enough to cover purchase system, storage system, issue to production and determination of stock levels for each item of material.

Furthermore, as stated by this author, types of Inventory systems can be classified in to the following two types.

#### 1) **Continuous Receive System /Fixed Quantity System**

i) **Perpetual System:** a record is kept of each transaction & the stock balance is compare to the order point. The order quantity is fixed; the time between orders will vary depending on the random nature & demand.

ii) **Two Bin System:** The inventory is physically separated in to the order point quantity (a special container or designated by a line on the storage bin or drum and the remaining units. The latter all consumed first and an order is placed on their conspire.



## 2) Periodic Review System

This involves determining the amount of an item in stock at a specified fixed time interval and placing an order for a quantity that, when added to the quantity on hand will equal to predetermined maximum law. The time period between rows of the quantity on hand is fixed. The maximum inventory level is the sum of the anticipated demand during lead time, the anticipated demand during the replenishment period (review period) and the safety stock.

### 2.1.2. Elements of Inventory Management

Various elements of an inventory control model are discussed by Saxena, (2004). According to him inventory management control systems have different elements. Among these, the following are considered as basic elements:

A. **Minimum Level:** This is the level below which the inventory level is not allowed to fall. In case, for any reason, the stock goes below the minimum level, the matter is reported immediately and action is taken to ensure that the material is received at the earliest with extra effort. In fact, reaching minimum level is an indication of the danger of a likely stock-out situation. It is essential to keep an eye on all the items, which have reached the necessary for these items.

B. **Maximum Level:** This is a control point to avoid any extra stock. Attempt is made to avoid excessive purchasing that may result in crossing the maximum level, and to ensure that the money is not blocked unnecessarily. Crossing of maximum level reflects inadequate inventory control and should not be allowed without proper analysis of overall benefits. Failure to control the maximum level may result in non-moving or slow-moving items and obsolescence. Inventory turnover would be adversely affected if maximum level is not controlled.

C. **Safety Stock:** This is a level, decided by keeping in view the degree of safety planned against being out of stock. A very high degree of safety would need a high level of inventory; where as a low degree of safety would require low inventory stock. If the risk of

being out-of stock is acceptable, there is no need of having safety stock. As the extent of Safety planned increases; a higher level of inventory is to be maintained. For a high level of safety a very large quantity is to be stocked, which is into desirable. According to the desired safety level, the inventory level, which is termed as 'Safety Stock' can be decided. Normally most organizations maintain safety stock equal to the minimum stock level.

D. **Lead Time:** The time from the point a requisition for material is raised by the user or the inventory control section has raised a purchase requisition after review of stock level and a future requirement, to the point when material is received, inspected, and is ready for use is known as the lead time.

E. **Re-order Point Level:** This is the level of inventory that triggers a purchase order. Usually the reorder point is equal to the amount would be used during the lead time period.

F. **Material Requirement Planning (MRP):** In order to avoid the conflicting objectives of Inventory management, which is concerned in minimizing inventory costs while providing adequate dependent demand inventory, inventory manager must balance the costs of having dependent demand inventory with the cost of doing without this type of inventory. MRP is a computer based management information system, which is used for determine the quantity and timing for the acquisition of dependent demand items needed to satisfy master schedule requirements.

G. **Economic Order Quantity (EOQ):** If one has to make decisions about managing an inventory, it is useful to understand the behavior of the inventor-related cost factors just discussed. These factors often help a manger determine which items should or should not be carried in inventory, what inventory levels should be carried for specific item, what order quantities are appropriate for given items. Among the factors that often enter this decision process is a concept known as EOQ the notion of an economic order quantity. As its name suggests, this concept holds that the appropriate quantity to order may be the one that tends to minimize all the costs associated with the order-carrying costs, acquisition costs, and the cost of the material itself.

## **2.2. Objectives of Inventory Management**

Inventory management is the active control program, which allows the management of sales, purchases and payments. Inventory Management controls operating costs and provide better understanding. Though inventory management may not be treated as an executive function but it is one of the most important functions in an enterprise. As stated by Datta (2001) the following are considered as the main objective of inventory management, they are Cost minimization (with or without discounting), Profit maximization (with or without discounting), Minimize warehouse costs, Maximization of rate of return on stock investment, Determination of a feasible solution, Keeping at an acceptable level the amount of human effort expended in the management and control of inventories, Ensuring flexibility to cope with an uncertain future, Minimize losses from damage, obsolescence and perishable, Maintain enough inventories in order to facilitate efficient and smooth production and sales operation, Maintain efficient transportation of inventories, Supply information on the volume of inventory to accounting, Make forecasts of inventory requirements, Establish an inventory system (policies and regulation that monitors inventories).

As Elion (1999) has remarked, there is often little difference between certain objectives and internally imposed constraints. Realization of this point can have an important bearing on the applicability of the solution obtained.

Therefore, inventory Management and control must be designed to meet the dictates of the marketplace and support the company's strategic plan. Many changes in market demands new opportunities due to worldwide marketing, global sourcing of materials, and new construction technology. This means, many companies need to change their Inventory Management approach and change the process for Inventory Control, (Snyder, 1998).

## **2.3. Costs Related to Inventory Management**

The heart of inventory analysis resides in the identification of relevant costs. Basically there are four categories of costs relevant to inventory decision making, namely i) replenishment costs, ii) carrying costs, iii) costs of insufficient supply in the short run, and iv) system control costs, (Silver, 2005). Again, from a managerial perspective these costs, aggregated across populations of items, are of more interest than on an individual item basis.

- a) Replenishment Costs: These are the costs incurred each time that a replenishment action is taken. It is convenient to express the costs as the sum of two parts: (i) A fixed component, often called the setup cost independent of the size of the replenishment; and (ii) A component that depends on the size of the replenishment, including the cost of the material itself.
- b) Carrying Costs: Having material in stock incurs a number of costs including; (i) The cost of borrowing the capital tied up or foregoing its use in some other investment, (ii) Warehouse operation costs, (iii) Insurance, (iv) Taxes, and (v) Potential spoilage or obsolescence.
- c) Costs of Insufficient Supply in the Short Run: When inventory levels are insufficient to routinely satisfy customer demand, costs are incurred, whether or not they are explicitly measured.
- d) System Control Costs: This crucial category of costs has often been ignored in some inventory literature. It includes the costs of acquiring the data necessary for the adopted decision rules, the computational costs and other costs of implementation. The costs of changing plans (so-called system nervousness) also fit in this category.

In general, unlike carrying costs, if a firm experiences a certain annual usage of an item, the number of orders placed during the year will decline as the individual order quantity increases, thus generating lower annual acquisition costs, (Dobler, 2004).

## **2.4 Stock Control**

### **2.4.1 Introduction**

Stock control is defined as the means by which materials of the correct quantity and quality were made available at the time when they were required, with due regard to economy in storage and ordering costs, purchase prices and working capitals. The modern stores management has a wide variety of functions that they have to perform as efficiently as possible. The way in which stores management carries out these tasks will be reflected in the overall efficiency of the organization because it is key supporter to the corporation. The Primary concern in the management of stock control must be to provide the right goods in

The right condition at the right price in the right place at the right time.

The control procedure of inventory should:-

- Safeguard stock against loss, obsolescence or misuse
- Maintain stock at appropriate level of quantity.
- Ensure that the inventory of the organization is properly used for business operations
- Ensure that the inventory is duly accounted for purchasing and controlling purpose

Depending on individual organization.

#### **2.4.2. Inventory Management Records**

Inventory control records are essential to making buy-and-sell decisions. Some companies control their stock by taking physical inventories at regular intervals, monthly or quarterly. Others use a dollar inventory record that gives a rough idea of what the inventory may be from day to day in terms of dollars. If the stock is made up of thousands of items, as it is for a convenience type store, dollar control may be more practical than physical control, (Arnold, 1998). However, even with this method, an inventory count must be taken periodically to verify the levels of inventory by item.

**Perpetual inventory control records** are most practical for big-ticket items. With such items it is quite suitable to hand count the starting inventory, maintain a card for each item or group of items, and reduce the item count each time a unit is sold or transferred out of inventory. Periodic physical counts are taken to verify the accuracy of the inventory card.

**Out-of-stock sheets**, sometimes called want sheets, notify the buyer that it is time to reorder an item. Experience with the rate of turnover of an item will help indicate the level of inventory at which the unit should be reordered to make sure that the new merchandise arrives before the stock is totally exhausted.

**Open-to-buy records** help to prevent ordering more than is needed to meet demand or to stay within a budget. These records adjust your order rate to the sales rate. They provide a running account of the dollar amount that may be bought without departing significantly from the pre- established inventory levels. An open-to-buy record is related to the inventory

Budget. It is the difference between what has been budgeted and what has been spent. Each time a sale is made, open-to-buy is increased (inventory is reduced). Each time merchandise is purchased; open-to-buy is reduced (inventory is increased). The net effect is to help maintain a balance among product lines within the business, and to keep the business from getting overloaded in one particular area.

**Purchase order files** keep track of what has been ordered and the status or expected receipt date of materials. It is convenient to maintain these files by using a copy of each purchase order that is written. Notations can be added or merchandise needs updated directly on the copy of the purchase order with respect to changes in price or delivery dates.

**Supplier files** are valuable references on suppliers and can be very helpful in negotiating price, delivery and terms. Extra copies of purchase orders can be used to create these files, organized alphabetically by supplier, and can provide a fast way to determine how much business is done with each vendor. Purchase order copies also serve to document ordering habits and procedures and so may be used to help reveal and/or resolve future potential problems.

**Returned goods files** provide a continuous record of merchandise that has been returned to suppliers. They should indicate amounts, dates and reasons for the returns. This information is useful in controlling debits, credits and quality Issues.

**Price books**, maintained in alphabetical order according to supplier, provide a record of purchase prices, selling prices, markdowns, and markups. It is important to keep this record completely up to date in order to be able to access the latest price and profit information on materials purchased for resale.

There are a number of standard procedures with combinations and variations, but the major objective is to clearly reflect the periodic performance. In order to determine the money value of materials on hand at any given point of time, the quantity of materials must be known and a value must be assigned to those quantities. The quantity may be obtained by counting or measurement, but the value assigned to individual items must be based on one

of the total money value of material's and related cost can be significantly different if different methods are adopted. With regard to this, Ditta (2001) on his part states that, the records which are usually kept in the stores have two broad characteristics: (1) Quantities are shown in records, if priced method is not followed; and (2) Regular balancing is done. In relation to this; the following important records and documents are mentioned:

- a) **Bin Card:** This is a record of movement of materials against each kind of stock in respect of daily stores transactions. It shows daily receipts, issues and balance quantity on hand.
- b) **Stores Identification Cards:** These cards are kept in the stores against each bin or rack where stocks are actually kept in order to identify the materials.
- c) **Materials -received Note:** Apart from the material log book kept for the purpose, when materials are passed on to the stores by the receiving section after proper verification and approval by the inspection authority, the materials and the supplies are taken into stock through a document known as materials -received note or goods received note.
- d) **Materials Requisition Slip:** When materials are passed on to the departments or other user's on receipt, a document used is known as material requisition slip.
- e) **Material-Returned Slip:** When materials are not required by the respective department, returned to store with an authorization called material returned note.
- f) **Material Transfer Note:** When materials are transferred from one department to another department or from one job to another, material transfer notes are prepared and sent to the stores and stores accounts department for adequate recording of materials issued to that particular department/job.

## **2.5. Inventory Control Techniques**

### **2.5.1. Classification of Inventory Analysis**

Items that are in the inventory are not of equal importance in terms of the amount invested, profit potential) sock-out penalties, etc. Therefore, all items do not deserve the same degree of attention. Which implies; that selective inventory management approach has to be applied.

This shows that a different control management effort has to be allocated to the various classes of inventoried items according to their relative importance.

According to Lenders (1989) inventories can be classified in to various groups on the basis of the selective inventory management approach as follows.

1. XYZ Inventory Analysis (High, Moderate and Low Closing inventory items) Analysis.
2. ABC Inventory Analysis (Always, Bette, Control) Analysis.
3. VED Inventory Analysis (Vital, Essential, Desirable) Analysis.
4. SDE Inventory Analysis (Scarce, Difficulty, Easy) Analysis.
5. HML Inventory Analysis (High, Medium, Low) Analysis.
6. FNSD Inventory Analysis (Fast moving, Normal, Slow Dead) Analysis.

From the above mentioned classification of inventory, it is possible to look the details of the ABC inventory analysis.

(1). ABC Inventory Analysis: This analysis is based on Pareto principle i.e. vital few and trivial many. Wilfred Pareto noted that many situations are dominated by a relative vital few elements. According to him 90% wealth of the nation is in the hands of 10% of the population. This principle is applied in inventory management, so handful (vital few) items determine the success of the business. That is the highest investment is made on vital few items and the lesser investment on trivial many items. Modern inventory control system takes this in to account by classifying items in to ABC by value of usage. The high value items have lower safety stocks because the cost of production is so high. The low-value items carry much higher safety stocks.

Here there is no clear-cut principle to classify items into ABC for all organizations but the following are the general guidelines.

A. items constitute about 5-10% of the total number of items purchased (in inventory) that would account for about 70-80% of the total dollar value (usage value).

B. items constitute about 10-20% of the total number of items purchased (in inventory) that would account for about 10-15% of the total dollar value.

C. items constitute about 65-80% of the total number of items purchased (in



inventory) that would account for about 5 to 10% of the total dollar value.

(2.) VED (Vita, Essential, and Desirable) Analysis: The analysis is based on the criticality of inventory.

V-item - are items when go out of stock or when not readily available, completely bring the production to a halt. So they should be stored adequately to insure continuous production.

D-item - are all other items which are necessary but do not cause any immediate effect on production.

VED analysis specially pertains to the classification of maintenance spare denoting the essentiality of stocking spares.

(3). SDE (Scarce difficult easily) Analysis: This analysis is based on availability of items (raw materials).

S-item - are items which are in small supply and are usually imported items?

D-item - Stands for difficult items which are available in the market but not easily available.

For example, items which have to come from far off cities. E

-item - are easily available items; mostly local items.

(4). HML (High, Medium, Low) Analysis: The cost per item (per price) is considered for this analysis, High cost item (H), Medium cost items (M) and Low cost items (L) help in bringing control over consumption at the department level.

(5). FNSD (Fast, Normal, Slow Dead) Analysis: Here the quantity and rate of consumption is analyzed to be classified as fast moving, normal, slow and dead items. This classification helps in arranging stocks in the stores according to the frequency that the items are used or consumed.

(6). XYZ Analysis: The analysis is based on the value of closing inventory

X-items Items with high closing inventory

Y -items Items with moderate closing inventory

Z-items Items with low closing inventory

Here the question is; which of these selective inventories control is the best one? As

suggested by authors of the field, there is no one best way of doing things; but the best inventory analysis depends on factors like; situations, need of the organization, and nature of the items.

### **2.5.2 Advantages of ABC Analysis**

1. It ensures a closer and a more strict control over such items, which were having a sizable investment.
2. It helps management in planning its inventory need.
3. It releases working capital, which would otherwise have been locked up for a more profitable channel of investment.
4. It reduces inventory-carrying cost.
5. It enables the relaxation of control for the C'items and thus makes it possible for a sufficient buffer stock to be created.
6. It enables the maintenance of high inventory turnover rate.

### **2.6. Inventory Management and Storage Functions**

Storage could be looked beyond the responsibility of the store's manager and examined in terms of the needs of the whole organization. Accordingly, as stated by Gropalakrishnan (2004) storage can be considered as temporary location for materials need for operational purposes which is planned, organized and operated in such a way that the life time of each stock item is as short as possible consistent with economic operation.

From the stores point of view the most important thing is to keep the quantities of incoming goods as near as possible to the departments and the machine shops and assembly shop to facilitate their daily usage of materials.

Storage is expected to perform some functions:

- Receive the materials; check quantities and quality against purchase orders, invoices and specifications; certifies delivers and reports shortage, deficiencies in quality and partial delivers, and prepare receiving reports.
- Provide adequate and proper storage and preservation.

- Prepare and maintain bin cards, periodically check inventory records against actual stock.
- Minimize obsolescence, surplus and scrap through proper codification standardization and preservation.
- Highlights stock accumulation, discrepancies and abnormal consumption and effect control measures.
- Ensure good housekeepers so that materials preservation and effort control measures.
- Ensure good housekeeper so that material handling, material preservation, stock receipt and stock issues can be done accurately.
- Assist in verification and provide supporting information for effective purchase action.
- Keeping and maintaining stores areas in a clean and orderly condition so as to facilitate handling and preserved all safety regards and security measures.

It can be observed from the above listing that the storage function has multiple responsibilities in managing inventory related activities.

### **2.6.1. Storage Systems**

According to Arnold (1998) storages system can be classified in to closed, open, and random access storage system.

1. **Closed stores system:** This is the one in which all areas uses as a rule. That is, there is limited access to entry in to the stores in such a system. Materials are physically stored in a closed or controlled area. The general practice is to maintain physical control by locking the storage area whenever there are no activities. In this stage system, no one other than stores personnel is permitted in the stores. Material enters and leaves the area only with the accompaniment to an authorizing document. This system is designed to afford maximum physical security and to ensure tight accounting controls of inventories.
2. **Open stores system:** The open system represents the second major type of stores system. It finds its widest use in highly repetitive, mass production types of operations exhibiting a continuous and predictable demand of the same materials. In organization

using the open system, no storeroom as such exists. Each material is stored as close to its point of use as is physically possible. Materials are stored in bins, on shelves or racks, and so on, much as they would be stored in a storeroom.

The open system is designed to expedite production activities. It places little emphasis to the physical security of materials. The open system also places less emphasis on the accounting control of materials. Materials are usually put in to production without the use of requisition or a control document no perpetual inventory records are kept in an open system.

The open system is most applicable in situation where a repetitive production operation produces standard product. Materials handled in an open system should not be subject to pilferage, nor should they easily be damaged. If production requires delicate or preferable item they should probably be controlled in closed storeroom. Generally speaking, an open system is more likely to function successfully if it is not applied it to a large number of items, typically experience better results than those applying it to several thousand items.

3. **Random access storage system:** The Random access storage system is a unique type of closed stores system, employed by a relative small number of large firms. In this system, no material has a fixed storage location. When an item enters the storeroom, it is stored in the first available bin or shelf suitable for its storage requirement, and when it is withdrawn from stores the storage space is available for any other incoming item having similar physical storage requirement. All materials are thus stored at random locations throughout the store room. However, similar types and size of storage equipment are grounded together. This has the effect of dividing the storeroom in to areas of materials that are similar in size and storage requirements.

The random access storage system is clearly feasible only in a large operation. It requires electronic data processing equipment, as well as an expensive control system. The system also has several significance disadvantages. For instance, tight physical control of materials is more difficult to achieve. The other problem is when a record card is lost. When this happens, the item itself may literally be lost for an indefinite period of time. Additionally, when a physical inventory is taken it clearly becomes a major and time-consuming project.

However, a random-access storage system has two important advantages if it is properly designed and operated. First, it utilizes the storage space more efficient than a fixed location storage system. In arranging storage facilities, space for a fluctuating inventory level does not have to be left vacant for each individual material. Second, the system provides great flexibility.

The same storage facilities can easily accommodate different materials. The three- storage system identified can be used separately under different conditions or can be employed by the firm at the same time. Whenever maximum physical storage security and tight accounting inventory control is needed, a closed stores system will be the most appropriate one.

The use of open stores system is justified when a material has a repetitive use so that it will not be exposed to rapid deterioration. If the firm has strong desire to efficiently utilize its storage space, random-access storage system provides several advantages. Because of the advantages and disadvantages of these systems, it is rare that firms rely only on one system rather they use the combination of these systems.

### **2.6.2 Storage Functions and Activities**

Storage can have multiple functions. Among these, Ditta (2001) identified the following functions of storages.

- a) **Receiving Goods from Suppliers:** When supplier ships materials are ready to deliver the goods ordered, the receiving section should be aware of the dispatch or arrival of the materials through various documents such as purchase order copy, suppliers' advice notes, carriers' consignment notes and suppliers packing list.

The four documents are: the supplier's advice note, the carriers' consignment notes, the supplier's packing list and the copy of purchase order. All four documents are notes required for every individual receipt, especially for items of small value. However, they should be made available for most shipments. As soon as the materials are received in the stores, the storekeeper checks that the supplier's advice and the carrier's consignment note with corresponding copy of purchase order to make sure that there is no disagreement concerning the quality and description of the materials. The basic responsibility of receiving personnel is to perform their various activities in such a manner that all incoming materials are processed accurately and expeditiously. The following are the main functions of receiving when

the supplier delivers goods.

**Unloading:** Initially receiving department unloads the carrier's vehicle (truck, freight, car, etc). In some situations, unloaded goods are moved to another location by manual handling. In other situations, workers unload materials directly onto a conveyor that moves it to another location.

**Verifying Items and Quantity (Freight Bill and Purchase Order):** A freight bill is a document prepared by the carrier that includes information such as the number of containers, gross weights, and a general description of goods shipped. All unloaded materials must be initially verified to ensure that the number of cartons, bags or other units agree with the quantity shown on the freight bill.

Using the copy of the company's purchase order, an important check is made to determine whether the items received were actually ordered by the company. This function is important because suppliers sometimes make errors in shipments. Receiving department must be alert and return materials that were not included in the company's purchase order.

**Checking for Container Damage:** All containers are checked for external damages since any damage to containers is an indication of damage to the internal contents. If the receiving clerk finds evidence of containers damage, they should review it with a carrier's representative and note the damage on the freight bill or a receiving document. In order to establish carrier liability for damages, it is important for the receiving clerk to perform the checking before signing for the receipt of goods.

**Checking Hot List:** In many companies there are certain incoming materials that are urgently needed to satisfy internal or external customer requirements. Often, company personnel have devoted considerable time to expediting such shipments by paying premium transportation costs. To alert all pertinent personnel to the significance of these materials, a hot list is prepared and constantly updated. If any items in incoming shipments are found to be on the hot list, receiving clerk will give them preferential treatment in processing.

**Unpacking and Sorting:** those containers that have mixed contents are carefully unpacked and the materials are stored for ease of examination. The items are also separated to allow faster processing at a later point in the receiving function. Separation, considering the destination, reduces materials handling.

**Verifying Items and Quantity (Packing List and Purchase Order):** After containers have been unpacked, they will be checked to determine any possible discrepancy. The packing list is used to verify all items and their quantities. The receiving clerk also checks each item included in the packing list to determine if the item conform to the purchase order. Once the type of items has been verified, the next activity is checking whether the quantity of received material is the quantity ordered.

**Checking for Concealed Damage:** The term concealed damage refers to any materials damage that is discovered after the carrier has left. This damage should be reported to the carrier as soon as possible. A carrier's representative will be asked to review the material and the carrier will require a completed damage form. It is important that all damaged material be stored in a specified, restricted area so that it will not mistakenly enter the system as good material. The disposition of these materials should be determined quickly to avoid excessive storage.

**Unitizing materials:** Since all incoming materials are not received in unit load condition, they should be unitized whenever feasible in order to reduce materials handling and storage costs. The unitizing activity may be physically performed at different times in the receiving procedures. It is desirable to place these materials in a container that is compatible with both materials handling systems of stores and quantity requirements of operations. Also known as Goods Receiving Note (GRN), the receiving report is a certificate to accounts section for payment of goods.

**b) Transfers Goods from Other Branches and Offices:** In such case the arrangements are somewhat different from the practice followed for receipts from outside suppliers. There is no need for quality inspection in respect of materials transferred within the same organization. But, it is still necessary to check quantities and inspect for damages. Transfer of this type is made through a transfer note or internal shipping documents. Materials may also be returned from production or other departments. They may return materials which have been drawn from the storehouse and subsequently found either to be in excess of their needs or unsuitable for the intended purpose. When goods are

transferred from central store to other branches the transfer or shipping documents should be designed in a manner that suit control for the arrival of the material by the storehouse.

- c) **Receipts from Customers:** Materials may also be received from customers. Receipts from customers fall into two categories; Complaints or rejected materials, and Materials received for servicing. In both cases; they should be dealt with urgently because it can result in the loss of customer goodwill. The rejected materials should be given special priority and care should be taken not to put them back into active stock.
- d) **Inspection:** Weighing, measuring, testing or any other form of inspection must carefully inspect incoming materials. The purpose is to ensure that they conform to the purchase order and are of the proper quality.

The inspection is particularly necessary in the case of raw materials and components, which go in to the product. No organization can afford to accept materials that do not meet quality requirements. Thus, incoming materials should be inspected prior to their acceptance. The final acceptance of materials will be only they have passed the quality test. Therefore, technically the purchasing action is not complete until the inspection is over.

Inspection is generally done by the inspection section/department. In certain cases the materials department may take the responsibility for inspection of incoming goods. Inspection may be carried out in the receiving section or in a separate place adjacent to receiving section or in a separate place adjacent to receiving section.

- e) **Marking of Stock:** it is the responsibility of the store's manager to ensure that certain materials held by the stores are marked in some way to identify their ownership and origin. This applies especially to items of equipment or items which are of high value and therefore more liable for theft or misuses. There are two reasons for marking stocks:
  - *Marking discourages Theft:* In as much as marked stock cannot easily be sold or used outside the organization, marked stocks may lose their degree of attraction for theft. Marking ensures that if stock is stolen and subsequently recovered by police or



other Agencies, the latter will know to whom the goods belong and this arranges for their return to the rightful owner.

- *Fire Precautions:* these are very important in relations to stores security and it is the responsibility of the stores management to ensure that all precautions include the use of warning notice and equipment or devices in order to prevent or fight fire.
- *Segregation of High Risk Materials:* Most stores find it more efficient and cost effective to store all so - called 'High-Risk' materials such as: petrol, oils, explosives, and other chemicals in a store specially designed for that purpose. Such a store is usually placed a reasonable distance from main building of the organization.

**f) Knowledge of Materials:** Part of the storekeeper's job is to have a sound knowledge of the materials and item he/she is dealing with. Such knowledge will include all the basic characteristics of a material and its behavior in given conditions and circumstances. The following are reasons why storekeepers must have knowledge of materials.

- Application of the materials issued by the stores will often be guided by the advice of the storekeeper. Therefore, storekeepers are expected to have a working knowledge of all materials held and their daily usage and application characteristics.
- The storekeeper must also know production processes involved so that allocated issues can be made properly and correct materials issued for a particular part of the process.
- Inspection of materials and quality control operations require that the storekeeper has a sound knowledge of materials and will know what to look for in relations to faults damage and substandard stock.
- Units of issue are also a very important part of the storekeeper's materials knowledge especially in relations to the recent changes in measurement.

**g) Deterioration:** Deterioration refers to loss of stock value due to spoilage, or damage. Vast amount of valuable stocks are ruined every year in stores, because of bad storage and the subsequent deterioration that takes place. All materials will deteriorate eventually, but the period of time involved and therefore, the useful life of the materials can be greatly extended if steps are taken to prevent deterioration caused by inefficient storage and handling of materials.

**h) Health And Safety:** Here are several dangers involved in the working environment be it in the factory, office, workshop, or the storehouse. Such dangers and accidents represent a huge loss of output and efficiency as a human suffering. Therefore health and safety is of vital importance to all managers and in this case especially to stores management. The incidence of accidents in stores will depend partly upon the materials stored, but will also be greatly affected by the way work is organized and by working environment.

### **2.6.3. Stores Security**

Stock security is one of the most important aspects of stores management, which covers not only theft and fraud, but also stock deterioration, damage, and obsolescence, (Arnold, 1998). There are two main methods by which the security of the stores can be attempted. They are security services and stores management security. The former, deals with stores security provided by an external party, while the latter involves internal system of stores security.

- a) **Security Service:** This is a method where the company makes use of specialized organization that supply a trained team of security guards and other personnel to guard against theft. Though such services are not well developed in most organization of developing countries, they are widely used in the developed world on fee basis. Since the security staff is well trained, they are reliable to cope with different situations; if required twenty four hours service is available. In addition to this, security service has also got the advantageous in that it reduces the damaging effect of conflict between members of the company's own staff. The disadvantages are : it is a very expensive service; the security staffs do not become involved in stock loss other than theft or fraud; a high security staff turnover makes it difficult to build relationships with them; and the outside intervention in the security area may lead to friction between the organization staff and management in case of theft
- b) **Stores Management Security:** In this method, the company provides stores security service by making use of its internal staff rather than relying on outside intervention. Accordingly the storekeeper and store manager are ultimately responsible for the stock held in their charge. In view of this, most organizations rely on the stores

management to control stores security. The advantages of such method are; it builds up good relationships and trust between the organization and its staff; Stores staff will be able to cover the aspects of deterioration, damage and obsolesces; and stores management will be held accountable for stock loss. The disadvantages are: stores management may not be fully trained in security techniques; and large-scale theft involving the stores staff may not be easily discovered. The stores management has a direct responsibility for stores security in all means in which materials are stored, marshaled, and handled. These include: stores buildings; stockyards; and marshaling points. There are broader responsibilities and duties of the store's manager in relation to stores security each of which demanding great care and attention to ensure a comprehensive security cover.

## **2.7. Dimensions of Inventory Management Problems**

Most authors agree that, the following classification of inventory management problems could useful for research and application purposes. However, most authors recognize that such a scheme runs the risk of stimulating research of a very incremental nature in that there are such a large number of distinct combinations of assumptions regarding the various dimensions, (Buzacott and Shantikumar, 1993).

**2.7.1 Single versus Multiple Items:** Can each item be considered in isolation for decision making purposes? Item interdependencies can take on a variety of forms including, (Lee 2003). These include:

- An overall constraint on budget or space used by a group of items.
- Coordinated control to save on replenishment costs. Possibilities here include group discounts, situations where a major setup cost is incurred if any member of a family of items is replenished, and circumstances where items share the same transportation mode.
- Substitutable items: when a particular item is not in stock, the customer may be willing to accept a substitute product.
- Complementary demand: certain products tend to be demanded together; in fact, the customer may not accept one without the other.

**2.7.2 Time duration:** In some situations there is a relatively short selling period and remaining stock cannot be used to satisfy demand in the next season. This decoupling effect simplifies the analysis compared with the multi- period case, (Bell, 1998). When the horizon extends well out into the future and there is considerable uncertainty present, a pragmatic approach is to use a rolling horizon implementation. At the start of each period the current decisions are made only considering information on a relatively small number of periods in the future.

**2.7.3 Number of Stocking Points:** Sometimes it is appropriate to treat a single stocking point in isolation. However, in many organizations inventories of the same item are kept at more than one location. In multi-echelon situations the orders generated by one location become part or all of the demand on another location. In addition, one can have horizontal multiplicity, that is, several locations at the same echelon level with the possibility of transshipments and redistributions, (Cao and Silver 2005). Supply chain management concepts, such as the pooling effects of centralized inventories, or delayed product differentiation, are relevant here.

**2.7.4 Information and Control:** In multi-location problems how much sharing of information occurs across and up/down the supply chain? Is control centralized or decentralized? What incentives are in place to facilitate collaboration? As Lee (2003) has noted, e-business provides new opportunities in areas such as efficient procurement, the use of secondary and spot markets, auctions and mass customization.

**2.7.5 The Nature of the Product and the Type of Demand Process:** Is the product consumable, perishable and/or recoverable/repairable? What generates the demand? Are there primarily external customers or is there internal usage? Is the item used as a spare part for regular maintenance and/or repair? Are we talking about an end item or a component of two or more other items (Agrawal and Cohen 2001)? Are life cycle considerations important? Is it a new item, in its growth phase, mature, or facing declining demand? In addition, what are important influences on the demand in a specific period? These can include marketing decisions, competitor actions, general economic conditions,

seasonal effects, and so on. Is the demand primarily from a captive market or is there a significant chance of losing sales/consumption when demands take place during an out-of-stock situation? Are there different classes of customers that have to be distinguished?

There are a number of possible choices in modeling the demand process. For simplicity in exposition, the researcher ignored most of the aforementioned issues and assumed that demand is to be modeled as just a function of calendar time. The possibilities include:

- Deterministic level demand
- Deterministic, but varying in a known way with time
- Known stationary distribution with known parameters
- Known stationary distributions but with parameters not assumed
- Unknown stationary distribution
- Non-stationary, probabilistic demand

**2.7.6 Procurement Cost Structure:** The unit value of an item may depend upon the size of the replenishment. This may be a result of a supplier discount or it can come about through freight consideration, (Abad 1988). In some cases the so-called fixed cost of replenishment may actually be semi-variable. Other complexities can include special procurement opportunities, on a one-time or repeating basis, as well as credit terms, i.e. non-zero payment periods. In addition, costs in general can change over time, or process improvement.

**2.7.7 Nature of the Supply Process:** Important factor is the replenishment lead time. Possible assumptions here parallel those related to the demand process, *visa*: there is a known lead time associated with each replenishment, replenishment arrives after a random lead time, there may be seasonal effects on the lead time, can the lead time be affected by, for example, expediting actions?

In addition, what happens at the end of the lead time? Is the entire requested amount or a randomly differing quantity received? Also, there may be interruptions in supply such as weather-related, strikes, equipment breakdowns, scheduled downtimes, and so on, (Parlar and Perry, 1995).

The supplier may be severely capacitated, usually in a construction context. In such a case can capacity be reserved ahead of time? Is there more than one supply option (combination of supplier and transportation mode) available? If so, it may be profitable to simultaneously use two or more of these options.

Are used items returned, possibly in conjunction with demands for new? Can the returned items be resold or reused after possible minor adjustments/repairs? Here one is into issues of recycling, reverse logistics, conversion of units, (Silver and Moon, 2001). Obsolescence or deterioration of stock may be important considerations. Obsolescence represents the situation where the stock is still in appropriate physical condition but can no longer be sold at anywhere near its original price. Deterioration or perish-ability signifies that for legal and/or physical reasons the stock cannot be used for its original purpose after the passage of a certain length of time.

Disposal of stock becomes an option to prevent obsolescence or perish ability. Even when the latter are not relevant, disposal may be useful to compensate for errors in forecasting, record keeping, order placement, and so on.

## **2.8. Empirical Review of Inventory management and control Practices**

Studies have been conducted by various researchers concerning the practices of inventory management and control in both public and private body with the aim of investigating the general practices in such companies. Several have embarked on the problem of inadequate funds, long procurement procedure, inadequate qualified personnel, and inadequate stock control policy and procedure.

According to Berhane Woldeabreha (2015), studied on “Inventory Management Practices of the Ethiopian Electric Utility: The Case of Addis Ababa City”, the study concludes that utility should see its inventory management as a key functional part which can determine the quality of electric service provision. There was a problem of inventory management at all levels and its result was reflected directly on customer dissatisfaction and poor quality electric service provision and the main cause for power interruption was identified as material shortage. The study found out that enhancement in the level of effectiveness in inventory management

practices would result in increased business performance of Ethiopian Electric Utility (EEU). Thus, it can be implied that inventory management of the utility has very crucial role to the operation of the utility while there were critical issues that needs improvement in the EEU's inventory management. Some of these issues were economic order of quantity; application of ABC inventory management rules; planned self- reliance in material supply where domestic production and supply is opted; transparency to customers and employees; strong attention from the Board of Directors/Government; strengthen internal control systems to reduce misuses and increase ethical awareness of the employees.

Another study conducted by David Asiima (2012), "Inventory Management Practices and Organizational Performance: A case study of taso mbarara". Basing on the findings, Inventory management helps organizations to cut down costs incurred by an organization. It can therefore be concluded that inventory management practices are related to performance of an organization, corporation or business as regards service delivery. Inventory is a significant asset in organizations. Its effective management is a key task within the auspices of operations and viewers of organization. Inventory control in an organization co-ordinates the purchasing, manufacturing and distribution functions to meet the marketing needs and ensures that organizations performance is in line with the set objectives and centers on customer satisfaction. Inventory management challenges interfere with a company's profits and customer service. They cost an organization more money and lead to an excess of inventory overstock that is difficult to move. Inventory management is one of the important key activities of any organization. It is important in logistics planning and control, production process, purchasing and satisfaction of customers' services all of which are important in organizational performance. Inventory management helps organizations to meet higher than expected demand. This helps the organization to protect against running out of inventory.

In the following section, empirical literature pertaining to Inventory management and control Practices was reviewed by different authors and was presented by Thogori M. & Dr. J. G. (2014).

### **2.8.1 Inventory management**

The main aim of inventory management is to ensure that organizations hold inventories at the lowest cost possible while at the same time achieving the objective of ensuring that the company has adequate and uninterrupted supplies to enhance continuity of operations. A study carried out

by Bhausahab & Routroy, (2010) shows that companies are keen in managing their inventory so as to reduce costs, improve the quality of service, enhance product availability and ultimately ensure customer satisfaction. Results of a study show that inventory management has a huge financial implication on both the customer satisfaction and financial performance of an enterprise.

The inventory management aims to optimize the investment by maintaining adequate and satisfactory levels of materials capable of meeting the needs of customers. To meet these goal managers need to find the best answer to such questions; what to order, how much to order? and when to order? So to review the following variables empirically can be helpful in this regard.

### ***Inventory levels***

High levels of inventory increases the probability that the customers are likely to get what they want, increases sales and service levels (Cachon & Terwiesch, 2006). High inventory levels however lead to both stock holding costs and in-store logistics errors. This is because it becomes difficult for the employees to perform shelving and replenishment which makes goods physically available in the store but the employees cannot trace those (phantom products), (Ton & Raman, 2005).

Maintaining optimum levels of inventory is important in an organization because excess inventory results in stock holding costs (rental charges, opportunity costs, obsolescence costs, breakages, pilferage) and inadequate inventory (stock outs) is also costly as customers may leave to competitors . When inventory management (maintaining adequate inventory levels) is carried out efficiently, it ensures that the materials needed in an organization are available in the right quality, quantity thus avoiding issues of overstocking and under stocking and ultimately guaranteeing customer satisfaction and increased profits.

### ***Inventory Costs***

Inventory costs in an organization comprises of inventory carrying costs (opportunity costs, insurance, rent), ordering costs (transport charges, insurance on goods in transit, inspection of goods inwards) as well as the shortage costs (idle machines, labor, loss of sales).

A study by Narkoty (2012) among the Ghana health services found out that inventory is one of the largest assets in the organizations and hence the need to manage it. Results of a study conducted by Nordin (2002) shows that inventory costs can be reduced by implementation of



reordering points as well as appropriate Economic Order Quantities (EOQ).

### ***Lead Time***

Reduction in lead times means that products and information flow in a seamless manner which allow all the supply chain members to respond to the customers' needs quickly while maintaining inventory to a minimum (Brewer, 2000). The increase in the distance from the suppliers premises and the complexity in the logistical aspects often results in longer lead times and higher levels of inventory. However, it is often a challenge for companies that strive to achieve cost reduction through lower lead-times and reduced inventory levels since it is difficult for logistics to achieve both goals . Better management of inventory is directly proportional to customer satisfaction.

### **2.8.2. Inventory Control**

Jackson and Stent (2007) on their side proposes a non-exhaustive list of internal control measures as key indicators on its components which includes: staff competency, segregation of duties, isolation of responsibility, access and authorization, comparisons reconciliations, and source document design.

## **2.9. Research gap**

One might expect the seemingly infinite stream of inventory theory related research to be a key resource for managers seeking to gain a competitive advantage through inventory management and stock control. However, some have suggested that managers who turn to inventory theory research may find it to be of little significance or that it has little to offer in terms of enhancing inventory practices. This has led many to suggest a gap exists between inventory theory and practice. While the varied solutions offered to bridge this gap represent valuable research, input from practitioners is noticeably absent. Therefore, an empirically derived agenda founded on practitioner-identified issues, is needed. There were very few studies that have been comprehensively been done on assessment of inventory management and stock control in public sector and hence the study intend to fill those gaps.

A discussion of a number of reasons for the existence to the gap was presented by Zahakis (2000) the following are some of the researches based suggestion forwarded by different authors to bridging the gaps.

More attention should be devoted by analysts to formulating an accurate model and obtaining a good solution to it rather than getting the optimal solution to a mathematically

interesting but possibly unrealistic formulations of the practical problem.

More research should be focused on transient, rather than steady state conditions. The latter, although much more analytically traceable, are becoming less and less relevant due to shortening life spans of products as well as widespread implementation of continuous process improvement.

More emphasis should be placed on achieving consistency in decisions and on demonstrating improvements over current performance. Diagnostic tools can be helpful in this regard. An understandable decision rule that improves somewhat on current conditions is almost certainly better than the optimal solution that is neither understood nor accepted by management (Woolsey, 2006).

More attention should be devoted to the aggregate consequences of inventory decisions rules. Top and middle management, who are usually responsible for the go-no-go decisions on a new system, are much more interested in the aggregate consequences than in the performance on an individual item basis. Exchange curves are useful tools in this connection in that they show the tradeoffs between aggregate measures of interest for different possible decision systems.

More attention should be given to the behavioral aspects of inventory management. A crucial phase of any effective OR study is convincing the decision maker and those providing the data that the decision system is aiding, not replacing, them and that it is in their interest to cooperate.

More attention effort should be directed to problems whose solution would be directed to problem whose solution would be a significant benefit to practitioners.

## CHAPTER THREE: RESEARCH METHODOLOGY

### 3.1. Research Design

This research was a descriptive type by its nature. Because the study describes the current situation of the issue; and forwards possible solutions for the problems identified related to inventory management and stock control practice of the utility. According to Mugenda and Mugenda (2003:39) descriptive survey design is appropriate because it involves collecting data in order to answer questions concerning the current status of subjects of the study. Kothari (1995:39) notes that descriptive design is concerned with describing, recording, analyzing and reporting conditions that exist or existed.

### 3.2. Sampling Design

The target population of the study which directly related to the issues under discussion was 96 staff employees and 4 officials. Using convenient (professional mix) and purposive sampling, among 44 staff employees of EEU –Gofa Central Store 24 respondents, from these 24 respondents 12 of the respondents were stock control staff employees, only who have been counting the annual physical inventory in Gofa Central Store, were selected as a sample and 72 staff employees from Addis Ababa regions ; which consists of 44 staff employees from 22 district service center, that is, from each district 1 technical supervisor, who receives operational material to the ultimate customer and 1 store man; 20 regional finance staff employees, here except the four regional finance managers, the rest sixteen(16), regional finance staff employees, only who have been counting the annual physical inventory in each district store, were selected as a sample and the rest 8 regional store men were selected as a sample. In each region there are 2 store men, who receive from central store or purchases and issue/supply inventories for each district centers found under them; and in each district service center there is one store man assigned to facilitate the logistic activities, that is, who issues inventories to the authorized employees later delivered to the end users (customers) for operational activities, Source: Addis Ababa Regional officers.

Table 1: Samples taken from the four Addis Ababa Regions

<b>Addis Ababa Regions</b>	<b>Numbers(quantity) of District in each Regions</b>	<b>Sample Numbers of the District Selected</b>	<b>Number of Employees*No of District(No of Employees in the District Stores)</b>	<b>No. of employees in each Region's warehouse</b>	<b>Regional finance staff employees</b>
South Addis Ababa region	6	5	2 x5 =10	2	5
North Addis Ababa Region	7	5	2 x5=10	2	5
West Addis Ababa region	9	7	2 x7 =14	2	5
East Addis Ababa region	7	5	2 x5=10	2	5
<b>Sub Total</b>	<b>29</b>	<b>22</b>	<b>44</b>	<b>8</b>	<b>20</b>

Source: Questionnaire analysis, November/2016.

Table 2: Samples taken from EEU-Gofa Central Store

<b>Gofa Central (Warehouse Numbers)</b>	<b>Warehouse Staff Employees</b>	<b>Stock Control Staff Employees</b>
Warehouse 1	2	2
Warehouse 2	2	2
Warehouse 3	2	2
Warehouse 4A	2	2
Warehouse 4B	2	2
Warehouse 5	2	2
<b>Total</b>	<b>24</b>	

Source: Questionnaire analysis, November/2016.

### 3.3. Types and Sources of Data

The research relied on primary and secondary data sources. In collecting the primary data, interviews were held with four heads of the departments; the questionnaires were administered for the 96 respondents.

The interview part was targeted on officials in the purchasing department, logistic and warehouse department, finance department, and heads of these departments. The questionnaires were distributed to the 96 staff employees in the targeted departments and work units of the utility. The secondary data sources were collected from documents from reports, related books, internet, and company's manuals, etc.

### **3.4. Data Collection Method**

The methods of data collections employed in this study were questionnaire and interview. The reason for questionnaire, because respondents take responsibility for reading and answering the questions taking time to think about their replies. To collect reliable data, the researcher was used questionnaire, interview and observation. Questionnaires were prepared in Amharic (later translated to English Language) and administered for the 96 respondents. The questionnaire was both open and close ended. Furthermore, leading interview questions were prepared and held with four officials of the department, to relate and rationalize if information gap occurred with the responses through questionnaire.

Concerning the interview, the researcher conducted with four officials of the department, namely finance, procurement, logistics and warehouse, and operation, as they are closely related to inventory management and stock control activities.

Dobler (2000; as cited in Gondana: 3) argues that well and efficiently controlled inventories can contribute to the effective operation of the firm and hence the firm's overall profit. Proper management of inventory plays a big role in enabling other operations such as production, purchases, sales, marketing and financial management to be carried out smoothly. Basic challenge however is to determine the inventory level that works most effectively with the operating system or system existing within the organization management.

An efficient system of material control should be comprehensive enough to cover purchase system, storage system, issue to production and determination of stock levels for each item of material, (Arnold, 1998)

Procurement and inventory management are critical to production companies as well as to service companies, as spending in procurement is often one of the biggest parts of the

company's budget. They ensure the availability of all supply categories for operations and infrastructure. Both are networked with the other functional areas making and delivering the products. There is a strong demand for the knowledge about managing supply and demand. This means, knowledge about strategies, concepts, processes, methods and technical systems in the areas of procurement and inventory management.

The purchasing management department ensures that all goods, supplies and inventory needed to operate the business are ordered and kept in stock. It is also responsible for controlling the cost of the goods ordered, controlling inventory levels and building strong relationships with suppliers. Store shall receive dispatch documents from the suppliers/ purchase department. Dispatch documents generally consist of the following Suppliers' Challan Invoice(s) , Packing list / Shipping list , Test Certificate(s), Guarantee Certificate, Copy of insurance policy (if goods are to be insured by the suppliers), etc. More specifically, as a public company, it is believed that the right service delivery is started through right procurement practices in the company. (Right in terms of quality, quantity, time, and place, etc), (source: company's manual).

Regarding the operation department, lack of inventory leads to loss of operation. So inventory management has direct and significant effect on operational performance and a key element for improvement of the level of services delivered. When the materials damaged due to improper storage space or lack of sufficient warehouse or even open shade, this would have an impact on the efficiency of the operation. When materials expose to sun light and rain due to improper storage, it is inconvenient when loading or unloading such items and also takes long period of time until the rain stops and in addition this incurs unnecessary labor cost and time when the wooden drum, holding the actual material (such as electrical cable) is broken down by sun light and rain and as a result the cable disassembled. In sum, all the above factors lag the operational time; this in turn has a negative impact on the satisfaction of the customer and which ultimately causes a bad image by the public towards the company. The reason for this is that, Inventory control practice starts from the purchases of electric materials and continues up to the finished of electric works.

With regard to finance department, Inventory management plays a very important role in the overall cost of operations and supply chain of any business big or small and has direct and

significant effects on company's finance. Excessive inventory leads to loss of profitability. So finance department assists in controlling/auditing the stock of inventory in the company. If the stock is controlled inefficiently it can cause high storage cost, obsolescence and reduction in working capital. Safety stock shall be fixed for each material or group of materials based on past experience and proper analysis. It shall be fixed by the respective operation (distribution) department.

The financial statement is prepared by finance department. The cost accounting system, the perpetual or periodic systems of inventory control are recorded in accounts sections. Therefore finance department is relevant for inventory in order to record and control activities in related to inventory. Accurate stock control records and inventory control are important aspect of financial accounting as well as the corner stone of procurement management. The company's finance department controls/audits inventories when conducting a physical count annually and verifies whether there is a discrepancy or not then makes adjustments and finally prepares report with necessary remarks identified on physical count. The department, through its work units, enter the daily transactions data (receipt and issued of materials) in to and out of the respective ware houses / stores, to the system (computer). Furthermore, it approves for budget when materials are ordered to purchase. The logistic and warehouse department recommends for and agrees on logistics and warehousing strategies, policies and procedures.

### **3.5. Data Analysis**

The collected data were expressed qualitatively and quantitatively. Such data were tabulated and organized in tables and graphs using SPSS version 20 where necessary. Then, they were analyzed and interpreted using percentage, mean scores. The problems faced the company in managing inventory and stock control practices were extracted from the discussions. Qualitative method employs the meanings in use by target respondents to explain the current situation of work realities (issues) and such realities were organized, analyzed and interpreted to summarize, conclude, and recommend the results of the research. Emphasizing situational details that is currently occurring allows qualitative method to describe processes of inventory management and control because such research work is highly descriptive through recounting what is said: to whom, how, when and why. In general, qualitative method has the ability to highlight the underlying issues and that it has the potential to humanize the theory that

will be researched in the field.

The study was employed quantitative methods of data analysis as it becomes of great value to the researcher who attempted to draw meaningful results from a large body of qualitative data. Quantitative method provides the means to separate out the large number of confounding factors that often obscure the main qualitative findings. Quantitative analytical approaches also allow the reporting of summary results in numerical terms to be given with a specified degree of confidence.

Quantitative analysis approaches become meaningful as there is a need for data summary across many repetitions of analysis and interpretation of data. Data summarization in turn implies that some common features do emerge across such repetitions. Thus the value of a quantitative analysis arises when it is possible to identify features that occur frequently across the many major findings of the research. As there exist common strands that will be extracted and subsequently coded into a few major categories, then it will become easier to study the more interesting qualitative aspects that remain. Quantitative analysis approaches are particularly helpful when the qualitative information is collected in some structured way, even if the actual information will be elicited through interview and Questionnaire.

### **3.6. Ethical consideration**

Ethics is there to minimize harm and to ensure that the research participants are not subject to any risk or exposure due to any improper methods of protecting privacy. In relation to the research work, EEU was asked its consent with a supporting letter issued by St. Mary University and the company became volunteer for the research work. Accordingly, the researcher took in to account the following ethical considerations.

- ✓ Any relevant data for the study was collected by issuing an official letter to EEU.
- ✓ The target respondents were fully informed about the purpose, method, and intended possible uses of the research, what their participation in the research entails and what risks, if any, are involved.
- ✓ The confidentiality of information supplied and the anonymity of respondents is respected.



## APTER FOUR: RESULTS AND DISCUSSION

### **4.1 Results/ Findings of the study**

#### **Introduction**

In this part, analysis and interpretation of the data collected through questionnaire and interview were presented with regard to assessment of inventory management and stock control practices: the case of Ethiopian Electric Utility in Addis Ababa Regions. The analysis and interpretation of these data were organized in to six sub-parts: I Current practices of inventory management; II Availability of sufficient resources and facilities for inventory management functions; III Contribution of inventory management for company's success; IV. Controlling theft and flawed; V. Availability of inventory management and control policy and procedure that guides flow of activities and VI inventory management problems of the company (incorporated in the discussion part). The classification of these parts is based upon the Basic Questions'of the study.

#### **Data Sample Information**

A total of 96 questionnaires were distributed at EEU-Gofa Central Store and Addis Ababa Regions. Out of which 91 were returned, two questionnaires were rejected due to missing data and three were returned unfilled. Therefore, 91questionnaires served as data for analysis to present the findings and draw conclusion. Further the data analysis is performed to reach the findings.

Table 3 reveals the demographic information of the respondents. When we see the first demographic variable that is gender division of the respondents, majority of the respondents were males, i.e. 68.1% representing a bigger part of the sample group. However, 31.9% of the respondents were females. This study was only aimed at those staff employees who were working at the target warehouses/stores and who have very close relations in the logistic and warehouse operations. The main reason for not involving the response of other staff employees of the company is to keep the reliability of the data collected. The second demographic variable, the age structure shown in the table above 35 (38.9%) were above 40 years old. The remaining 25 (27.8%) and 29(32.2) of them were within 22-32 and 33-40 age

group respectively. This implies that the majority of the respondents were at matured ages. When we see the distribution of the third demographic variable which is the level of education, only 26(29.2%) of the respondents have college diploma and above level of education. The remaining majority of the respondents (70.8%) have certificate and below levels of education. This indicates that there was lack of qualified personnel in the company. Furthermore years of experience of the respondents in the company was described accordingly, among the total 91 respondents; 49(53.8%) of them had experience in the company for more than 12 years. The data implies that the company incorporate many employees that have long years of work experience.

Table 3: Distribution of Demographic Variables (N = 96)

No.	Variable	Frequency	Percent
<b>1</b>	<b>Gender</b>		
	A. Male	62	68.1
	B. Female	29	31.9
	Total	91	100
<b>2</b>	<b>Age</b>		
	A. Below 22 years	1	1.1
	B. 22-32 years	25	27.8
	C. 33-40 years	29	32.2
	D. 41 and above	35	38.9
Total	91	100	
<b>3</b>	<b>Education Background</b>		
	A. Below 12 <sup>th</sup> grade	11	12.4
	B. Certificate	52	58.4
	C. Diploma	17	19.1
	D. First Degree	8	9
	E. Masters Degree and above	1	1.1
	Total	91	100
<b>4</b>	<b>Work Experience in the company</b>		
	A. Below 1 year	2	2.2
	B. 1-4 years	3	3.3
	C. 5-8 years	11	12.1
	D. 9-12 years	26	28.6
	E. Above 12 years	1	53.8
Total	91	100	

Source: Questionnaire Survey, February/2016

#### 4.1.1. Current Practices of Inventory Management of the utility

Table 4: Inventory Types

No	Alternative	Frequency	%
1	Fixed assets and machines	2	2.2
2	Raw material	1	1.1
3	Good processed for use	34	37.4
4	All	54	59.3
	Total	37	100

Source: Questionnaire analysis, February/2016.

With regard to inventory type, respondents were asked "What kind of inventory does your company hold?" As shown in table 4 the respondents 54(59.3%) were agreed that, the types of inventory in the company are all kinds.

Table 5: Frequency of Physical Count

	Frequency	Valid Percent	
What is the frequency of conducting physical count in the company?	A. Once a year	86	94.5
	B. Twice a year	5	5.5
	C. Monthly	0	0.0
	D. Once a week	0	0.0
	5 Not at all	0	0.0
	Total	91	100.0

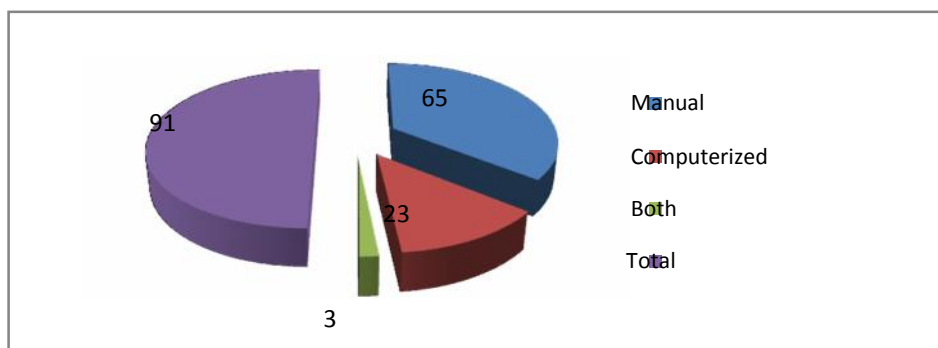
Source: Questionnaire analysis, February/2016.

With regard to physical inventory count, respondents were asked "What is the frequency of conducting physical count in the company?" As the data in table 5 shows, almost all of the respondents (94.5%) were agreed that physical count was conducted in the company only once a year.

Stock verification is carried out to check stock discrepancy arising due to the following reasons but not limited to: Human error of omission/commission, Weight difference, Improper storage, Measurement difference, Improper documentation, Loss due to corrosion /

erosion / evaporation, Theft, pilferage, etc., material received but posting not made in stock ledger & bin card as per SRV (Store Receiving Voucher). Material issued without SIV/STV/MTN and/or posting not made in stock ledger & bin card, source: company's store manual. To be most effective, the inventory control system must provide information in timely manner to allow the company to make decision while problems can still be corrected. In this regards, conducting physical count can contribute for proper utilization and management of company's inventory.

Figure 1: Kinds of Inventory Recording System



Source: Questionnaire analysis, February/2016.

The respondents were asked to answer "What kind of inventory recording system does the company use?" Their responses were presented in figure 1. According to the data of this table, the majority, 71.40 percentages of the respondents were replied that, the company's recording systems were manual. Very few 23(25.3%) of the respondents were argued that, the company's inventory recording systems were computerized. On the other hand, 3.3 percentages of them responded as the company used both (manually and computerized). Manual recording systems, misplaced ledgers and vouchers, issuing without accompanying documentation and delays in posting causing discrepancies between actual and physical stock balances, (Morrison, 1994; as cited in Ng'ang'a : 36).

Automation can dramatically impact all phases of inventory management, including counting and monitoring of inventory items; recording and retrieval of item storage location; recording changes to inventory and anticipating inventory needs including inventory handling requirements. This is true even of standalone systems that are not integrated with other areas of the business, but many analysts indicate that productivity-and hence profitability-gains that are garnered through use of automated systems can be further increased when a business integrates its inventory control systems with other systems such as accounting and sales to better control inventory levels.

The trend toward automation in inventory management naturally has moved into the warehouse as well. As cited by Sarah Bergin contended in Transportation and Distribution magazine, the key to getting productivity gains from inventory management is placing real-time intelligent information processing in the warehouse. This empowers employees to take actions that achieve immediate results. Conversely, an inefficient warehouse system can cost businesses dearly in terms of efficiency, customer service, and ultimately profitability.

Furthermore, publically owned entities have numerous needs that can be met with embedded RFID (Radio Frequency Identification) solutions for access control, asset tracking, contactless payment, inventory management, and patron management offer new opportunities to improve service and increase operational accuracy and efficiency. The benefits and applications for embedded RFID in the government and public sector are limitless. Just a few of the potential uses: identify verification upon receipt, improve service and employee safety at warehouse facilities, manage supply inventories in real-time.

As stated in the literature, inventory management system aims at providing the desired level of customer services achieving cost efficient operation and minimizing inventory investment. These objectives can be summarized in the form of maintaining the required technology sufficiently which is considered the best option to cope up with any change in information.

#### 4.1.2. Availability of Required Resources and Facilities for Inventory Management functions of the Utility

Table 6 Resources and Facilities Available for Inventory and Warehouse Management

Items	Good		Satisfactory		Poor	
	Freq	%	Freq	%	Freq	%
Proper layout plan of the inventory storage facility	4	4.4	25	27.5	62	68.13
Separate area for receiving and distributing inventory	15	16.5	36	39.6	40	43.96
Required tools and equipments for inventory management units	9	9.89	29	31.9	53	58.24
Qualified human resources for the inventory management functions	6	6.59	30	33	55	60.44
Appropriate insurance coverage for significant inventories	0	0	2	2.2	89	97.8
Fire distinguisher for all stores	0	0	25	27.5	66	72.53
Sufficient light and ventilation for all inventory storages	4	4.4	21	23.1	66	72.53
Arrangement of shelves and drawers for all types of inventories.	7	7.69	30	33	54	59.34
<b>Overall Percentage</b>	<b>6.18%</b>		<b>27.20%</b>		<b>66.62%</b>	

Source: Questionnaire analysis, February/2016.

With regard to the availability of resources and facilities to inventory and warehouses

management departments of the company, respondent's responses were illustrated in table

6. According to the data of this table, with eight items average 66.62 percentages of the respondents agreed that, the resources and facilities fulfilled for inventory and facilities were poor. Accordingly:

The company lacks proper layout plan of the inventory storage facility, (68.13%).

The required tools and equipments for inventory management units were not fulfilled(58.24).

There was shortage of qualified Human Resources for inventory management functions of the company, (60.44%).

There was no appropriate insurance coverage for significant inventories, (97.80%). There were insufficient fire distinguishers for all stores, (72.53%).

There were no sufficient light and ventilation for all inventory storages, (72.53%).

The company lacks systematic arrangement of shelves and drawers for all types of inventories, (59.34%).

In sum, all the above statements show that the company's inventory management department and warehouses were suffered with lack of resources and facilities. This in turn resulted in poor performance of the inventory management and control system of the company.

### 4.1. 3. The contribution of inventory management for the success of the company's functions

Table 7: Inventory Management Practices of the Company

No	Items	Yes		No	
		Freq	%	Freq	%
1	Are there currently any items in stock that are obsolete or slow-moving?	71	84	14	17
2	Does the management monitor and approve obsolete and inactive inventories?	29	32	62	68
3	Is there a software/ technology/ within the inventory system that alerts the user when inventory levels are below or above certain levels?	9	9.9	82	90
4	Is there discrepancy between actual and record of inventory?	39	43	52	57
5	Does the company take safety stock/ buffer into account in any of its inventory planning calculations?	17	19	74	81

Source: Questionnaire analysis, February/2016.

In table 7, respondent's responses about the practice of inventory management and control of the company were illustrated. It gave emphasis for obsolete and slow moving items, a system that alerts the level of inventory; and the safety stock/ buffer in the company. Accordingly, 83.5% of the respondents said that obsolete or slow moving items are found in the stock. The majority of these respondents (68.1%) also said that, the management of the company does not monitor and approve obsolete and inactive inventory. Furthermore, according to the illustrated in table 7, majority of the respondents 82(90.1%) said that there is no system that alerts the users when the inventory level becomes below or above certain levels. In similar speaking 81.3% of the respondents agreed that the company did not utilize safety stock in any of its inventory planning calculations. This does not enable the company to ensure that decisions are based on

the most accurate information. However, efficient operations use a standard statistical formula that looks at historical data for individual products. Here, many decisions about inventory levels are strategically important. So instead of relying solely on the supply organization to decide, executives need to have a major say in the fundamental issues that impact inventory management—everything from determining the right breadth and complexity of product offerings to optimal plant and distribution footprints. Inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials (work- in-progress) and finished good so that adequate supplies are available and the costs of over or under stocks are low,( Kotler, 2000; as cited in Gondana:2).

A sound inventory control system should have to secure the best balance between too much and too little.|| Too much inventory carries financial rises and too little reacts adversely on continuity of productions and competitive dynamics. However, all the data illustrated in table 7 shows that, the managing bodies of the company did not make proper monitoring and approval of its inventory; there were no systems that alerts users when the level of inventory are below or above the required levels. As a result, the inventory management and control of the company makes the existence of large amount of obsolete and inactive inventory in the stock than the required inventory. Thus, it is advisable if the management of the company pays greater attention in avoiding excessive inventory and maintains adequate inventory to improve the function of the company’s business operations.

Table 8: The extent of receiving documents matched to purchase orders and invoices

		Freq	Valid Percent
Valid	1 very well	26	34.2
	2 Sometimes	48	63.2
	3 Not matched at all	2	2.6
	Total	76	100.0
Missing	System	15	
Total		91	

Source: Questionnaire analysis, February/2016.



The procurement process of any company should be free from any of defaults. The reason is that it is a fundamental requirement to manage inventory as well as control. The data in table 8 shows the extent of received documents match the purchase orders. According to the data of this table, only 34.2% of the respondents strongly agree consistency of the order and received documents. However, majority of the respondents (63.2%) were said it matches sometimes'. Very small respondents (2.2%) agreed that, the received document does not match at all with the purchased order. Furthermore, 14(15.4%) of the respondents argued that it never match at all.

If the purchase order does not much with the received materials; the supplied materials may not properly used for the purpose of the company's function. This means, the company's distribution functions were performed by the materials purchased with the interest of the purchasing organs; rather than the needs of the utilizers (user department) and purchase order (purchase department).

These respondents were further asked to answer; how much the company's domestic purchase and imported necessity are based on need assessment findings?|| the majority of the respondents were answered the question negatively. According to these respondents the company did not rely on need assessment results and planning when purchasing and importing materials from domestic and foreign markets. They further stated the following reasons for their responses: Sometimes materials purchased by the company were idle for longer durations without functions; Most materials were purchased without the consultation of concerned professionals and experts; Purchasing practices are not planned and based on assessment findings because there were huge amount of unnecessary materials stored in the company even most of them were exposed to danger. These all show that, lack of company's efforts to minimize the stock of irrelevant inputs and outputs through research based planning and forecasting during purchase of various inputs.

Table 9: Contribution of Inventory management and stock control

No	Items	High	Medium	Low
1	Adequate supervision	4.4	37.36	58.2
2	Clearly marking damaged and obsolete inventory	4.39	31.87	63.7
3	Counting of items and access to the tags for custody of the particular items	7.69	49.45	42.9
4	Careful investigation of significant overages and shortages	7.69	32.97	59.3
5	Prompt adjustment of records for inventory discrepancies after approval by a responsible official	4.4	38.46	57.1
6	The signing and dating of inventory count sheets by the person supervising the count	5.5	59.34	35.2
	<b>Average</b>	<b>5.67%</b>	<b>41.58%</b>	<b>52.8%</b>

Source: Questionnaire analysis, February/2016.

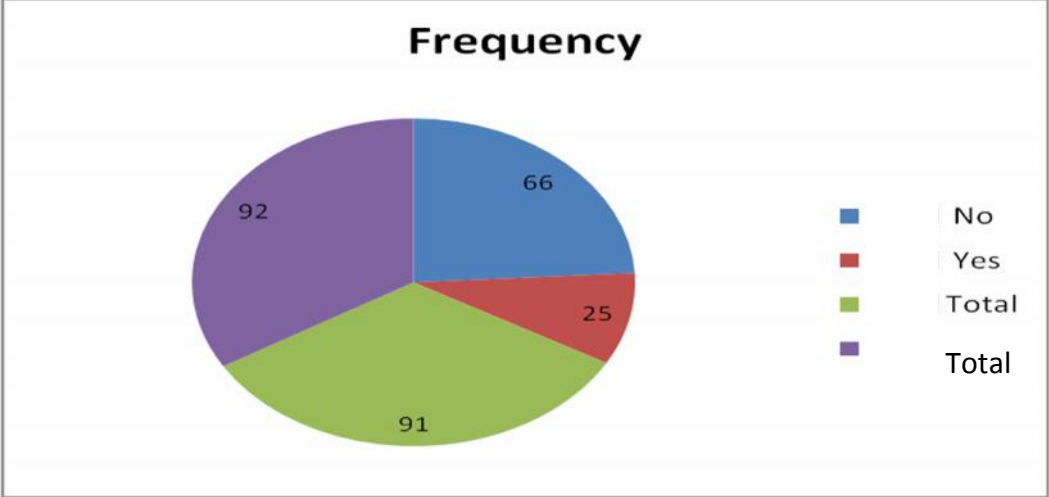
With regard to the overall contribution of inventory management and control system of the company with six items average 52.75 percentages of the respondents agreed that, the overall contribution of inventory management and control system were ||low||. Among the six items listed in this table, only item number three counting of items and access to the tags for custody of the particular items|| and item number six the signing and dating of inventory count sheets by the person supervising the count|| were found was scored above fifty percent (i.e. 59.34%) by respondents. Accordingly, the current practices of inventory management and control system of the company does not enable

- ✓ Providing adequate supervision, (58.24%).
- ✓ Clearly marking damaged and obsolete inventories, (63.74%).
- ✓ Careful investigation of significant overages and shortages, (59.34%).
- ✓ Prompt adjustment of records for inventory discrepancies, (57.14%).

An effective system will provide a company with a guide for what, when, and how much to buy of each style, color, size, price and brand. It will reduce the number of lost electric sales resulting from being out of stock of goods in popular demand. However, all the data illustrated in table 9 shows that, how much the importance of inventory management and control system is ignored in the company. This adversely causes the company not to effectively control costs related to inventory management. Therefore, it is extremely imperative to manage inventories efficiently and effectively in order to avoid unnecessary investment in them.

**4.1.4. Controlling Theft and Flawed**

Figure 2: Effort by the company to safeguard goods against risk of theft and lost



Source: Questionnaire analysis, February/2016.

Respondents were asked to answer; Does the management of the company take the appropriate steps and measures to safeguard goods against risk of damaged and lost by theft?|| Majority of the respondents 66(72.5%) were agreed that, the management of the company does not take the appropriate steps to safeguard goods against risk of damaged and lost by theft. The rest respondents 25(27.5%) inversely agreed. According to these respondents the company does not take the appropriate steps and measures to safeguard goods against risk of damaged and lost by theft. Further, they stated the following reasons for their responses.

- There were no sufficient warehouses to store properly all the incoming consignments. Due to this, the company's properties were exposed to sun light and rain. This in turn, facilitates the materials rather to be damaged.
- Loading and unloading activities were conducted by anyone who does not have any know how about the nature of the loaded and unloaded materials of the company.
- The right persons, who shoulder the responsibility properly, were not assigned at the right positions, rather to assign randomly, even who do not have any know how about the nature of the materials kept in the store.
- Wrong reports were presented when physical inventory count is conducted, as the damaged or inactive materials were not disposed timely. This in turn has its own negative impact when planning /forecasting the required materials to procure at least the reasonable quantity by the user department /work units. Furthermore, it incurs unnecessary labor cost and time spent.
- There was no any facility to its inventories, even to its employees.

Table 10: Inventory Control and Security Practices of the Company

No	Items	Ranks								
		5	4	3	2	1	Total	sum	Mean	%
1	Inventory items are maintained in a secure location	2	3	9	30	47	91	156	1.71	34.28
2	Important documents, including electronic media, are stored in a secure area with adequate protection from fire and /or water damage	3	8	19	33	28	91	198	2.17	43.51
3	Material released from store rooms only on the basis of requisitions which are approved by a responsible official of the department	13	36	25	15	2	91	316	3.47	69.45
4	A definite responsibility is designated for each inventory type	5	7	12	27	40	91	183	2.01	40.21
5	Receiving, issuing, accounting and storing responsibilities are properly segregated	4	10	12	39	26	91	200	2.19	43.95
		<b>27</b>	<b>64</b>	<b>77</b>	<b>144</b>	<b>143</b>	<b>455</b>	<b>1053</b>	<b>2.31</b>	<b>46.28</b>

Source: Questionnaire analysis, February/2016.

Here, respondents were asked to separately evaluate each item of Inventory Control and Security Practices of the Company, using a five point likert scale: Very Good', Good', Moderate', Poor', and Very Poor'. Five different scores were assigned: 5, 4, 3, 2, 1, to represent this five-point scale.

According to respondents' average results of five items of table 10, the overall level of inventory control and security of materials in the company was found at 46.28 percentages(2.31 mean score). This means, the majority of the respondents were believed that, inventory items and materials of the company were exposed to risks of lost and unsafe situations.

Moreover, the percentages of each items illustrated in table 10 also shows the seriousness of the issue with specific items. This was manifested with the following items of the table's data.

- Inventory items are not kept at secure location.
- Important documents are not stored in a secure area with adequate protection from risk.
- A definite responsibility is not properly designated in the company for each inventory types
- Receiving, issuing, accounting and storing responsibilities are not properly segregated.
- This shows lack of adequate qualified human resource in the inventory department of the company.

#### **4.2. Discussion on Interview results, Findings and Observation**

The respondents (of questionnaire and held with interview) were asked to answer what happens to lost and stolen inventory in your company? “ They gave their responses as follows: the case is reported to the local police by the responsible staff employees, then the internal auditors are sent to the place where theft occurred and then they conduct checking and finally based on the auditor's report appropriate action is taken. The employee stealing the property is appeared in court. After completing the imprisonment he is fired without any compensation to the company.

When materials lost, the in charge store keeper takes the responsibility for the lost materials. In this case, depending on the amount of the lost materials the company takes different actions up on him/her, such as, to transfer to other work units as a demotion, if the lost materials are immaterial. However, if the lost items are materials to the company, the responsible one is accountable and the expenses of the lost items are recorded on behalf of the responsible store man.

For efficient functioning and proper accounting of materials, the standardized procedure for receipt, issue of materials etc. are essential. Policy has a number of functions including setting standards and ensuring a minimum level of uniformity in implementation of inventory management related activities; providing a framework for action and for dealing with potentially sensitive issues, for example what amount of inventory (which are critical for the company's operation) necessarily should be maintained as buffer stock; and promoting the transparency and accountability among departments and employees.

However, as per the interview held with logistics and warehouse head, a store manual was developed two years ago, however, it has not yet been approved by the board of the company, due to the disagreements between finance and logistic & warehouse departments on some points stipulated on such manual. Therefore, currently, there is no any practicable store manual in the company.

This reveals that, inventory management and control activities were performed with experiences. This also results in biasness among employees working on inventory management and control functional areas, and unfair decisions made by officials, as policies mean procedures or guidelines to take actions and to control operational activities. The consequences cause inventory imbalance (under, over stocking), high storage cost, obsolescence and reduction in working capital, failure to meet strategic objectives, etc. This in turn, inefficient cost minimization, poor service delivery, as the ultimate goal of inventory is to serve customer. According to Whitman and Mattord (2003), the objective of policy is to influence decisions, actions and behaviors of employees. It further specifies what behavior is regarded as acceptable and what not. As Mogad and Amos (1989), the key issue to be considered in formulating inventory policy is cost minimization. Accordingly, the company failed to keep a consistent

controlling of inventory related costs efficiently and effectively due to absence of practicable work manual with regard to inventory management and control. According to the visits and interviews conducted and as part of the observation, it was found that the company has been using unscientific inventory control and storage methods and management models. These poor performances are due to, among other factors, lack of automation (technology), workload on few staff employees, in convenient store location to load and unload the received and issued materials due to lack proper spaces, especially the district stores, the majority of which are gained by rent.

Still referring to inventory control numerous materials, especially stationary materials and fuels were expired and were being held in stock even without being able to be used. Again, the company does not have regular visibility into slow-moving and obsolete stock. Typically, slow-moving and obsolete stock stems from ineffective purchase forecasting and planning. Inventory leaders should have established processes regularly to determine why obsolete stocks are being created.

As a whole starting from the central warehouse to the regional and district stores, the warehouse/ store processes were done on paper, there was no record on the system when materials are being received and issued. This means, the concerned functional departments lack the right and on time information about inventories.

Due to Stiffness of procurement practice in the company and the long lead times, frequently the situations of lack of materials cannot be easily contained. The purchase orders were triggered based on intuition and experience of the buyers disregarding often even the inventory level information. This often causes the excess of materials that were not used and, lack of materials required and which ultimately contributing to unnecessary inventory carrying cost and poor service deliveries. The consequence of the former causes the company not to either use the savings to make investments in other assets or pay down debt. The heart of inventory analysis resides in the identification of relevant costs, (Silver, 2005). Again the result of table 7 above shows that there were obsolete or slow-moving items in the store. Inventory Control is as a systematic controlling and regulation of purchase, storage and usage of materials in such a way so as to maintain an event flow of production, at the same time avoiding excessive investment in inventories, (Android 1998). Accordingly, the company is

not employing its capital efficiently and effectively. Inventory control is the supply of goods and services at the right time with the right quality and quantity, (Ukpere 2014; January: 110).

### **Discussions on problems, Causes, and Suggestions**

Regarding inventory management problems of the company, respondents (questionnaire and interview) were asked three inter-related questions to state their responses: the questions were emphasized on identifying problems and their causes; and forwarding possible solutions. The responses of all respondents were organized as follows:

According to the responses, the major problems of inventory management and control of the company were associated with: Management and leadership practices of the company; Employment and workforce situation; Storage and warehouse state of affairs; Purchase requests and purchasing practices.

With respect to the causes of these problems, the responses emphasis on the points such as weak management and leadership traditions; Lack of competency, knowledge, skill, and experiences; Absence of computer utilization and appropriate technologies; Attempting and focusing to accomplish personal needs rather than company goals and objectives; Absence of assessment and monitoring practices and lack of understanding the real situation of inventory management and control of the company

Furthermore, improving human resources management; purchasing, store and warehouse management of the company; utilizing modern technologies; conducting training and development programs for employees and managers of the company were forwarded by respondents as possible solutions to solve the stated problems of inventory management and control practice of the company.

In general, Problems and their causes identified and suggestions forwarded by respondents were:

Concerning the Problems identified by respondents were: Dissatisfaction and poor motivation of employees working in inventory management and warehouse functions; Absence of mechanisms that identify best performing and least performing employees; least attention given to the materials and employees by the company's management; Expensive and important



materials of the company does not get proper attention; they were thrown away here and there. They were exposed to sun and rain; inefficient system implemented inside the warehouses and lack of automation; most materials were exposed to damage; Proper attention were not given to the available inventory items and purchased goods; there were no sense of ownership; The management of the company did not respond employees requests appropriately on time; There were no on time supervision and identifying obsolete and inactive goods in the company; Obsolete and damaged materials were not timely disposed in the company (loss of revenue to the company as not selling the damaged one to other utilizers at the right time); There were carelessness and lack of concern towards the properties and goods of the company by management and employees; negative influences towards their colleagues practiced by employees who have close/beneficial relationships with the management of the company; Inappropriate arrangements and display of inventory items they were found in and out of the storages in the company.

With regard to the causes identified by respondents were: Lack of assigning the right employees at the right place on the right time; absence of responsible personnel who in charge of accountability and transparency in the company; weak leadership practices; poor attention and carelessness of the management organ about inventory functions and employees; lack of knowledge and skills about inventory management and control systems among management and employees of the company; shortage and absence of materials and facilities required for inventory management functions and employees of the department; absence of sufficient warehouses for inventory storage in the company; missing to use appropriate technologies including computers and safety materials, such as fire extinguisher, for inventory management functions of the company; lack of proper guidelines and work manuals for purchasing and performing inventory management functions; absence of assessment and evaluation practices; and chain of communication and reporting systems.

Furthermore, suggestions forwarded by respondents were: Assigning all employees and managers adequately on the bases of their knowledge, competency, and experiences to the job position they fit for; Conducting continues assessments and evaluations of company's inventory and operation performance and developing improved systems of doing things; Preparing new organizational structure for inventory management related functional areas of the company;

Conducting need based training and development programs on inventory management areas for employees and managers of the company; Using modern technologies and computers' software

Taking immediate action on materials that do not give services for the company and that would not be used for future functions of the company; Rearranging the organization of inventory items and warehouses of the company on the bases of basic principles of inventory management and controlling systems by professional consultants; Modifying and applying workable manuals and guidelines for uses; Using research and assessment findings for decisions and actions in the company.

# CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

## INTRODUCTION

In this chapter the researcher gives conclusions and recommendations in line with the research questions and objectives.

### 5.1. Conclusions

Based on the preceding findings of the study the following conclusions were made:

As mentioned by Lambert and Stock (2001): increase number of mismatches between purchase orders and received materials and invoices, increase number of orders cancelled; periodic lack of sufficient storage- places; lack of ensuring a sufficient level of demand and satisfying demands regarding quantity, quality, place, time, and prices; accumulation of large quantities of obsolete items; wide variation in inventory turnover among distribution centers and among major items; absence or lack of lead-time and delivery time analysis; and the like were identified as symptoms of poor inventory management. The findings of this study reveal the occurrences of these features in the company.

The management is not giving sufficient emphasis for inventory management and control function of the company. Among others, this was manifested in: lacks to assign qualified employees to the right position on the right time; not devising mechanism to solve problems and to improve inventory management and control system of the company; not closely monitoring the performance of different organs and employees involved in inventory management and control processes and taking prompt decision when ever needed;

The management and employees working on inventory management and control functions of the company were faced with lack of knowledge, skill, and experiences to meet the expected performances effectively and efficiently. If such deficiency is not corrected through training, and/or reassignment of the existing human resources, or employment and assignment of qualified personnel for the company, these problems will lead the company to strong losses and ultimate falling stages.

According to the findings of this study, inventory items and materials of the company were exposed to risks of lost and unsafe situations. Expensive and important materials of the company do not get proper attention; they were thrown away here and there in and outside of the storages of the company. Most of them were exposed to sun and rain this facilitates their damages and happenings of other dangers. On the other hand, large amounts of obsolete and inactive inventory items were found in the stocks of the company. These all show, carelessness, lack of concern, and negative attitudes of managements and employees towards inventory items, materials and assets of the company. If such perceptions and practices are not corrected on time, the consequences will harm the company's business goals and customers using company's services.

The finding of the study proofs absence of materials and facilities required; and missing to use computer technology for inventory management functions of the company, which contributes for inventory management and controlling performances inefficient in the company. This can be more severe when supported by lack of proper guidelines and work manuals for purchasing and managing inventory functions of the company. So, such issues need proper attention of company's management.

Inventory management challenges interfere with a company's profits and customer service. They cost an organization more money and lead to an excess of inventory overstock that is difficult to move.

## **5.2. Limitation of the Study**

Most of the time, every research possesses its limitation. The degree of limitation depends on the situation that the researcher involves or the willingness of respondent about the proposal. The researcher faced different problems that make hard to conduct the study properly. Among these, the following problems were occurred; Lack of sufficient information, for example, some of the respondents were left open the open ended questions; and Willingness of employees at time of data collection .

### **5.3. Recommendation**

On the basis of the findings of this study and conclusions made the following recommendation were forwarded.

The company should operate perpetual inventory system in addition to the periodic one in order to up-to-date information available about the quantity of material in stocks; and establish strong inspection system that provides proper documentation on quantity and quality of items periodically.

The company management should give attention to create proper storage condition for perceivable materials and machine that were currently exposed for sun and rain inside the company's compound.

Inventory control, management and planning are a key to improving inventory performance and are the responsibility of all employees who have an impact on inventory whether through forecasting, ordering receiving, quality assessments, storage, distribution or use in operation. Conducting education and training programs for staff and managers on basic knowledge; and other relevant training areas like setting targets, measuring performance reporting and communication skill, etc. seem essential.

Conducting experience sharing program with others companies, working on electrical utilities in managing and controlling inventories.

The management of the company is required to create collaboration among departments participating on inventory management and control systems of the company.

It seems mandatory to the company to use modern technologies and computers that incorporate inventory management software.

The management of the company should give proper emphasis for monitoring of the performance of the processes of inventory management and control system; and taking prompt action when ever need is required.

The management of human resource particularly employment, assignment and motivation of employees working on inventory management and control functional areas needs appropriate attention of company's management.

The company must take immediate actions on non-functional materials (that do not give services for the company);

It is advisable if the company establishes new inventory management and control systems, on the bases of basic principles of inventory management and controlling system with the assistant of professional consultants;

It is better if the management of the company assigns qualified and competent consultants that assist managers and employees to undertake the functions of inventory management and controlling of the company by initiating training courses, discussion forums, seminars, workshops and experience sharing programs.

The company must prepare and utilize appropriate work related policies and procedures about inventory and materials management of the c

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# **APPENDICES**



3. Educational Backgrounds:

- A. Below 12<sup>th</sup> grade\_\_                      C. Diploma\_\_                      E. Masters Degree and above \_\_  
B. Certificate\_\_                                  D. First Degree\_\_

4. Work experience in the company:

- A. Blow 1year\_\_                                  C. 5-8 years                                  E. above 12 years\_\_  
B. 1-4 years\_\_                                      D. 9-12 years\_\_

5. Current Job title and Responsibility \_\_\_\_\_

***Basic Research Question Related Information***

6. What kind of inventory does your company hold?

- A. Fixed Asset and machines\_\_                      C. Goods processed for use and  
B. Raw materials\_\_                                      D. All\_\_

7. What is the frequency to conduct physical count?

- A. Once a Year \_\_\_\_                      C. Monthly \_\_\_\_                      E. There was no Inventory count in  
B. Twice a Year \_\_\_\_                      D. Once a week \_\_\_\_                      the company \_\_\_\_

8. What kind of inventory recording system does the company use?

- A. Manual recording system                      B. Computerized recording system                      C. Both

9. Please identify the availability and sufficiency of the following resources for inventory management department of the company.

No	Factors	Good	Satisfactory	Poor
1	Proper layout plan of the inventory storage facility			
2	Separate area for receiving and distributing inventory			
3	Required tools and equipments for inventory management units			
4	Adequate and Qualified Human Resources for the department			
5	Appropriate insurance coverage for significant inventories			
6	Fire distinguisher for all stores			
7	Sufficient light and ventilation for all inventory storages			
8	Arrangement shelves and drawers for all types of inventories			

10. How much receiving materials are matched to purchase orders and invoices?

A. Very Well \_\_\_\_\_ B. Sometimes \_\_\_\_\_ C. Not matched at all \_\_\_\_\_

11. How much of the company’s domestic purchase and imported materials are based on research findings about the necessity of the materials?

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12. Please identify the levels, how the current inventory management practices of the company enables and facilitates the following issues.

No	Items	High	Medium	Low
1	Adequate supervision?			
2	Clearly marking damaged and obsolete inventory?			
3	The counting of the items and access to the tags for custody of the particular items?			
4	Careful investigation of significant overages and shortages?			
5	Prompt adjustment of records for inventory discrepancies after approval by a responsible official?			
6	The signing and dating of inventory count sheets by the person supervising the count?			

13. In relation to your company's practices; answer the following questions with YES or No answers.

\_\_\_\_\_ a) does the current inventory management and control practice of the company enables to maintain the required inventory sufficiently?

\_\_\_\_\_ b) Are there currently any items in stock that are obsolete or slow-moving?

\_\_\_\_\_ c) Does management monitor and approve obsolete and inactive inventories?

\_\_\_\_\_ d) Is there a software /technology /within the inventory system that alerts the user when inventory levels are below or above certain levels?

\_\_\_\_\_ e) Is there high rate of discrepancy between actual and record inventory.

\_\_\_\_\_ f) Does the company take safety stock /buffer in to account in any of its inventory planning calculations?

14. Does the management of the company take the appropriate steps and measures to safeguard goods against risk of damaged and lost by theft? \_\_\_\_\_ How/why?

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15. Some items related to inventory control and securities are listed in the following table. Please identify the rate of practices in your company. The ranking numbers indicates;

5=Very High; 4= High; 3= Moderate; 2= Low; and 1= Very Low.

No	Items	Ranks				
		5	4	3	2	1
1	Inventory items are maintained in a secure location					
2	Important documents, including electronic media, are stored in a secure area with adequate protection from fire and /or water damage					
3	Material released from storerooms only on the basis of requisitions which are approved by a responsible official of the department					
4	A definite responsibility is designated for each inventory type					
5	Receiving, issuing, accounting and storing responsibilities are properly segregated					

16. What happens to damaged, lost and stolen inventory in your company?

Lost \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Stolen \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

17. Does the company properly prepare policies and procedures in writing, and make to be correctly understood by concerned bodies? Briefly state your responses.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

18. What are the major problems of the company' s inventory management practice?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
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19. What are the possible causes for these problems identified in question number 18 above?

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20. To make inventory management more efficient and to prevent problems in the company; please forward your suggestion and comments

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## **APPENDIX-II**

### **St. Mary University School of Graduate Studies Department of Management**

#### **Leading Interview Questions held with Officials**

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1. How much of the company' s domestic purchase and imported materials are based on research findings about the necessity of the materials?
  2. Does the management of the company take the appropriate steps and measures to safeguard goods against risk of damaged and lost by theft? How and why?
  3. What happens to lost and stolen inventory in your company?
  4. Does the company properly prepare policies and procedures in writing, and make to be correctly understood by concerned bodies?
  5. What are the major problems of the company's inventory management practice?
  6. What are the possible causes for these problems identified in question number 5 above?
  7. To make inventory management more efficient and to prevent problems in the company; please forward your suggestion and comments.

**APPENDIX  
III**

Table 11: District Service Centers found within Addis Ababa Regions located in the city of Addis Ababa

Store No.	Location	City
<b>17</b>	<b>West Addis Ababa</b>	Addis Ababa
231	Mexico	Addis Ababa
232	Abenet	Addis Ababa
233	Besrategebereal	Addis Ababa
234	Ayer Tena	Addis Ababa
235	Kolfe	Addis Ababa
236	Dere Building	Addis Ababa
237	TeklehaYmanot	Addis Ababa
239	Betel	Addis Ababa
221	Karakorie No.9	Addis Ababa
<b>14</b>	<b>South Addis Ababa</b>	Addis Ababa
251	RasDesta	Addis Ababa
252	Shiromeda	Addis Ababa
253	AdisuGebeya	Addis Ababa
254	MedhanialemAkababi	Addis Ababa
255	Winget	Addis Ababa
256	woreda 7	Addis Ababa
<b>16</b>	<b>North Addis Ababa</b>	Addis Ababa
271	Beklo Bet	Addis Ababa
272	Bole	Addis Ababa
273	Sar Bet	Addis Ababa
274	GoffaMazoria	Addis Ababa
275	Piassa	Addis Ababa
276	Saris	Addis Ababa
277	Lafto	Addis Ababa
<b>15</b>	<b>East Addis Ababa</b>	Addis Ababa
211	K/mariam	Addis Ababa
212	Wuubethintsa	Addis Ababa
213	Atlas hotel	Addis Ababa
214	Gergi	Addis Ababa
215	Gurdshola	Addis Ababa
216	Kotebe	Addis Ababa
217	GibiGebriel	Addis Ababa

**APPENDIX IV  
DECLARATION**

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of \_\_\_\_\_. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or

in full to any other higher learning institution for the purpose of earning any degree.

\_\_\_\_\_

\_\_\_\_\_

Name

Signature

**St. Mary's University, Addis Ababa**

**May, 2016**

**APPENDIX V  
ENDORESEMENT**

This thesis has been submitted to St. Mary's University, school of Graduate Studies for examination with my approval as a university advisor.

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Name

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Signature

**St. Mary's University, Addis Ababa**

**May, 2016**