ST. MARY'S UNIVERSITY COLLEGE

FACULTY OF BUSINESS

DEPARTMENT OF MANAGEMENT

AN ASSESSMENT OF MATERIAL HANDLING AND DISPOSAL IN THE CASE OF ISSAYAS AND HEROUY CONSTRUCTION P.L.C.

BY

SENAIT TEKLU

JUNE, 2011

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A SENIOR ESSAY SUBMITTED TO THE DEPARTMENT OF MANAGEMENT
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APPROVED BY THE COMMITTEE OF EXMINERS

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Advisor	Signature
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Examiner	Signature
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Examiner	Signature

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Material Handling is the movement, storage, control and protection of materials, goods and products throughout the process of manufacturing, distribution, consumption and disposal. It is closely connected with the storage of Material. (Nair, 2005 P.P. 54) It can be defined as the function dealing with the preparation, placing and positioning of materials to facilitate their movements and storage. This includes every considerate of the product except the actual processing operation (Gopalaknishanna and Sundresses 1997: 189).

The ability to handle construction materials safely is vital to the proper functioning of any construction jobsite. Planning and mobilization of materials and equipment is an important aspect of completing the job on time (Stormme, M. 2010:21).

When the site is ready for work to continue, the transportation of construction material onsite begins. Usually, everything that goes into the construction project has to be brought to the site. Many times the only way to move this material onsite is by truck. These vehicles (loaded with concrete blocks, pipes, equipment and lumber) provide a continuous flow of raw materials and parts that are vital to the project (Donald & Dobeler, 1984: 85).

Handling and storing materials involves many different activities such as hoisting steel beams, driving a truck loaded with raw material, manually carrying bags or material and stacking supplies. Employees can be injured by improperly lifting materials (manually and by machine), falling objects and improperly stacked supplies (Stormme, M. 2010:21).

Material handling uses the right method to provide the right amount of the right material at the right place, at the right time, in the right sequence, in the right position, in the right condition, and at the right cost (Ibid; 21-26).

Getting rid of waste and other used construction material can be a challenge. Don't let the waste debris pile up for days. Remove all scrap lumber, waste material, combustible scrap and rubbish from the immediate work area as the work progresses (Stormme, M. 2010:21).

Disposal of materials is often done by dropping or tossing it off a building. There is a danger of this material falling and striking a worker or equipment. If dropping material more than 20 feet to any point outside the exterior walls of the building, use an enclosed chute (Ibid; 21-26).

Although the disposal of surplus and scrap is in appearance a sales function, it is generally handled by the Logistics Department because of its better knowledge of the market condition and the dealers and uses who purchase such items. Logistics Department is in better position to bring pressure on the original suppliers to accept the return of surplus stocks (Nair,2005:56).

Issayas & Herouy Construction plc is registered as General Contractor GC-1 with experience of over 30 years in the construction industry.

The company has executed different construction projects like Low Cost Houses, Luxury Houses, Commercial Buildings, Hospitals, office buildings, Libraries, Ware Houses, Factories, Collage Complex, Sport Fields etc in the building section and City Asphalt Roads and Gravel Roads in the road section.

1.2 Statement of the Problem

Construction Companies are playing vital role in economic development program of the Country. One of the most important inputs of construction works are materials; therefore,

efficient and effective management of materials is imperative. However, materials handling of construction companies are not compatible with the significance attached to them. Therefore, it is worthily and timely to study the material handling in the construction sector in detail and recommend ways to improve the entire problem (William and Johnston, 2004:142).

Problems listed below are related to material management:

- The materials are not properly handled and are not available on time when they are required.
- There is no proper coordination among material management and other sections of the Company.
- The Company does not adapt efficient material handling and disposing system.
- The Company does not maintain regular program of inspection and verification of materials.

1.3 Research Questions

The study has examined the problem by asking the following questions:

- What systems are adopted by the company to improve efficiency material handling?
- Is there any coordination among material control and other sections of the company?
- What procedure is employed to dispose scraps and materials no longer needed due to different reasons?
- Are there any excessive materials that lock up a lot of capital?

1.4 Objective of the Study

1.4.1 General objective

The general objective of the study is to assess materials handling and disposal system in the case of Issayas and Herouy Construction P.L.C.

1.4.2 Specific Objectives

The study comprises the following specific objectives:

- To asses what procedure are adopted by the company to ensure that purchasing storing and issuance of stock items are made in economic, efficient and effective manner.
- To ascertain whether the company uses its warehouses economically.
- To ascertain that the company has adopted system and procedures so as to dispose scraps and obsolete materials no longer needed due to change in time, design.
- To ascertain that whether the company's capital is tied up by holding unnecessary stock items or not.
- To Check that whether there is sound co-ordination among work units engaged with material management or not.
- To recommend systems, and procedures, specific measures so as to improve efficiency and effectiveness of material handling system and procedures of the company.

1.5 Significance of the Study

The study has provided an opportunity for the Company in informing that the excessive material hold a lot of capital. It has also shown how such events result in the inefficiency of warehousing activities. It tried to indicate the importance of smooth coordination among work units engaged in material management with the other departments in reducing excessive material stocks. It also tried to give alternative solution on how carrying cost, time and effort will be reduced by minimizing the holding of scrap or obsolete materials. Furthermore it also helped the managers as well as the subordinates to look for the main problems associated with material handling and disposal system and also effect on the over all development of their company.

1.6 Delimitation of the Study

The research is conducted in Issayas and Herouy Construction P.L.C., especially in Logistics Department of the company where material management functions are performed. Procurement, warehouse or store management and transport services are organized under logistics department of the Company. The scope of the study is restricted only in procurement, storing, consumption and disposal of materials.

1.7 Definition of Terms/ Operational Definitions

Material Handling is the science of moving materials like raw materials, finished components, finished goods, packing materials, operational suppliers, tools jigs and fixture scrap, etc form one place to another. It is closely connected with the storage of material (Gopalaknishanna and Sundresses 1997: 189).

Disposal Wastes are materials that are not prime products (that is products produced for the market) for which the generator has no further use in terms of his/her own purposed of production, transformation or consumption, and of which he/she wants to dispose. Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities. Residual recycled or reused at the place of generation are excluded (OECD. 12 Oct. 2009. <http://stats.oecd.org/glossary/detail.asp accessed date December 10, 2010).

1.8 Research Design and Methodology

1.8.1 **Research Design**

The general research method that is employed in conducting the research is descriptive type.

1.8.2 Population, Sample Size, and Sampling Techniques

The total population for the study is 120 employees. Disproportional stratified sampling is employed. The selected technique has given more opportunity to collect relevant data from the employees for the research. Questionnaires were distributed to 36 employees working in different sections. The following tabular presentation gives us more clarifications on the process of data collection:

Name of Sections	Total No. of employee	Selected Employee
Store Management Section	26	9
Requisitioning Section	16	5
Finance Section	20	6
Procurement Section	15	4
Transport Section	25	7
Engineering Section	18	5
Total	120	36

1.8.3 Type of Data Used

By conducting this research, primary and secondary sources of data are obtained.

1.8.4 Method of Data Collection

Primary data is collected using questionnaire and interview. Questionnaire is used to collect data from employee working in store management section, requisitioning section, finance section, procurement section and transport section and interviews is used to collect data from relevant department heads and site managers. The secondary data is obtained from books, magazine and other papers that are relevant to the topic.

1.8.5 Data Analysis Method

Various types of data are collected from all sources and organized in a meaning full way and interpreted as well. The data obtained from the questionnaires and interviews is tabulated and presented in percentages.

1.9 Organization of the Study

The study is organized in to four chapters; the first chapter is dealing with introduction part, which includes background, statement of the problem, objective, scope, limitation, significance, and methodology of the study. The second chapter is dedicated to shows review of literature regarding material handling and disposal. Chapter three discusses the data used in the study and findings of the study whereas conclusion and recommendation are presented in the forth chapter.

CHPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Definition of Material Management

According to Debler (1984), materials management as practiced in business to day, can be defined as a confederacy of traditional materials activities bound by a common idea the idea of an integrated management approach to planning, acquisition, conversion, flow, and distribution of production materials from the raw material state to the finished product state (Debler, 1984: 27).

The materials management concept advocates the assignment of all major activities which contribute to materials' cost to a single materials management department. This includes the primary responsibilities which are generally found in the purchasing department, plus all other major procurement responsibilities, including inventory management, traffic, receiving, warehousing, surplus and frequently production planning and control some companies also include customer service, scheduling, shipping, materials handling and physical distribution in their definition of the material management (Ibid; 27).

2.2 Material Management and Strategic Planning

It is interesting to note that a materials management type organization substantially aids in the development of strategic materials plans. When purchasing, inventory control, production control traffic and stores are dispersed throughout the firm as separate departments, it is much more difficult to integrate and control them- and to develop a corporate material difficult to integrate & control them and to develop a corporate materials plan –then. When these department are consolidated into a single materials management unit. Additionally, a materials management department can contribute significantly to the development of an integrated strategic plan, for the following reasons (Debler, 1984:117).

A materials manager operates at a higher level in the firm than traditional purchasing, traffic inventory mangers, etc thus he has freer access to other top corporate officers and the strategic plans of other departments in the corporation (Ibid; 117-118).

1. When purchasing and the other materials functions are a part of materials management, they tend to gear their actions more directly in to corporate wide objectives, with less emphasis on narrower departmental objectives.
2. Material management department often have their own planning units: these planning units help the purchasing, traffic, inventory, and related materials functions think in terms of corporate strategy. Because the material management concept can contribute so positively to improved strategic materials planning, this clearly is another "plus" for the materials management type of organization.

2.3 Activities in Materials Management

Nair, (1994) specified the following activities as the main ones with the sphere of materials management. Stock control or inventory control: planning and maintaining stock of raw materials, tools, general supplies etc… A. Well as handing classification, codification, A-B-C analysis, etc. purchasing. Purchasing Developing source of supply, finalizing prices, placing orders, obtaining materials by the right time standardization value analysis etc… surplus and scrap. Store keeping, receiving, storing issuing and material handling (Nair, 1994:42).

In related way Dobler (1984) has given the following activities (functions), Forecasting and planning of materials, demand sales production material plan. Inventory control for supplying materials to fulfill operational plans, in determining "how much" and "when" determining "how much" and "when" (Debler, 1984:86).

2.4. Importance and organization of Materials Management

According to Gopalakrishana and Sundarson (1998) an analysis of the financial statements of a large number of private and public sector organizations, disclosed a nearly sixty percent of their total expenditure accounts for materials.

Thus, the importance of material management lies in the fact that any significant contribution made by the materials manager in reducing materials cost will go a long way in improving the profitability and the rate of return on investment. Such increase in profitability, no doubt, can be effected by increasing sales. But with increased competition and government restrictions on expansions this alternative is not easily achieved. Besides, some increase in the profitability can be achieved by concentrating on the materials cost which is typically a major rupee item for the most organizations. In fact as market pressure intensifies, organizations will be forced to cut down the costs and here the materials manager steps in to play his role. With the concept of materials organization they further stated (Gopalakrishana and Sundarson 1998:5-6);

"The interrelated functions of materials management are normally looked after by individuals. As the activities expend the functions of each individual become more and more specialized. The internal structuring of various functions as well as the relationship of the materials management division with the other functions as well as the relationship of the materials management division with other divisions. – technical finance and marketing in the cover all organization becomes critical. The material management function ought to be headed by a competent professional who must be a member of the top management team as managing materials is critical function" (Gopalakrishana and Sundarson 1998:5-6).

In related way Tomas, (1980) this modern approach is to have an integrated material department headed by materials manager with a purchase manager under his the item. Names may also lead to confuse perceivers which can be avoided by using a unique identification procedure of grouping similar items systematically (Tomas, 1980:112).

2.5 Materials Handling

Materials handling is the movement of material and supplies from one place of operation to another without affecting its value of performing any productive operation. It is an integral part of the material management process. Poor materials handling system always result in lower motivation on the work process. Scientific material at the right time in a given place to the

consumer. It deals with science involving movement, packing a sorting of materials manually or mechanically. Through scientific material handling considerable reduction in cost as well as in production cycle time can be achieved (Gapalakinshanan and suderson 1997:190).

Material handling Maximum use if space with minimum waste of times is the aim in planning storage and handling facilities. It is easy to save space by keeping good in high-bay racks or in mobile racks which have to be moved to gain access. Whether it is more important to save to be moved to gain access. Whether it is more important to save space, or to save time, depends mainly on the throughput. For low transaction rates, over-the counter service by hand is suitable. For high transaction rates, mechanization and automation can pay. In some applications goods are off loaded straight into conveyor systems which feed production, the stores being represented by loops and sidings in the system (Kumar, 2006:323).

2.6 Materials Handling Objective

According to Gopalakrishna (1990) the objective of materials handling is to supply material of the right quality with the right quality at the right time, and ensure these purchase have to be made from the right source with the right price. This has to be done by maintaining an uninterrupted and effective form of materials for production with a reasonable cost of final product (Gopalakrishna 1990:210).

The successful operation of any business depends to a large extent on the availability of good and services of the right quality, the right quantity form the right source, which the right price and at the right time. These generally form the classical “five rights” of material department that broadly generalize and sum-up the associated fundamental elements of the function (Arnold and Tony 1998:284).

2.7 Principles of Material Handling

According to Oberoi, as in many other areas of work, there is much to be learned from those who have worked in the filed of material handling in the past. This experience has been summarized in the principles of material handling, as follows (Oberoi, 2001:37):

- Related to planning eight principles apply:
    1. **Planning Principle:** All handling activities should be planned
    2. **Systems Principles:** Plan a system integrating as many handling activities as is practical and coordinating the full scope of operation.
    3. **Material Flow Principle:** Plan an operation sequence and equipment arrangement optimizing material flow.
    4. **Simplification Principle:** Reduce or eliminate unnecessary movement and/or equipment.
    5. **Gravity Principle:** Utilize gravity to move material wherever practicable.
    6. **Space utilization:** Make optimum utilization of the building cube.
    7. **Unit size principle:** Increase quantity, size and weight of load handled.
    8. **Safety principle:** Provide for safe handling method and equipment.

- Related to Equipment: Nine principle apply:
    1. **Mechanization/automation principle:** Use mechanized or automated handling equipment when practicable.
    2. **Equipment- Selection principle:** In selecting handling equipment, consider all aspects of the material to be handling, the move to be made, and method(s) to be utilized all interms f the lowest overall costs.
    3. **Standardization principle:** Standardize method as well as types and sizes of handling equipment.
    4. **Flexibility Principle:** Use methods and equipment that can perform a variety of tasks and applications.
    5. **Dead-weight principle:** Reduce the ratio of equipment dead- weight to pay load.
    6. **Motion Principle**: Equipment designed to transport materials should be kept in motion.
    7. **Idle-time Principle:** Reduce idle, or unproductive, time of both handling equipment and workforce.
    8. **Maintenance principle:** plan for preventive maintenance and Schedule repair of all handling equipment.

9. **Obsolescence Principle:** Replace obsolete handling methods and equipment when newer methods or equipment will pay off in a reasonable time.

2.8 Materials and User Department

With regard to Nair (1990), the production line will remain idle unless there is an uninterrupted flow of materials. Because of the numerous transactions, the two departments with have plenty of interaction and conflicts. The tendency in the majority of the production is normally to blame the purchase for any idling of its capacity. The material in its turn will claim that it was not warned sufficiently in advance e or adequate lead time was not provided or the specifications are vague. Therefore, it is essential that both these departments build their relations based on mutual trust (Nair 1990:247).

Communications form production should be handled properly so that no ambiguous or incorrect specification reaches the materials department and no unnecessary, irrelevant irksome references are made to the requisition in coordination meetings, Plossi and Wight (1967), purchases in turn should advise production promptly of any change in quality, quantity, increased rejections or delivery of suppliers thus enabling any changes in scheduling to be carried out with a minimum delay. A similar interrelation exists between the material and the maintenance department must always strive for standardization (Ibid; 247).

According to Nair (1994) the relationship between material and quality control or the finance and audit department is that which exists between examine with an examiner. The quality control department passes judgments on the purchased items and at times can be nasty by rejecting goods of acceptable quality, similarly the finance department can find fault with every purchase or ler and suppliers invoice (Nair, 1994:45).

2.9 Material Handling in Construction Job Site

According to William and Johnston (2004), efficient material handling is extremely important in optimizing the construction worker's productivity. Ideally, the necessary material should be within reach for crafts person as it is needed for the installation. Obviously, this rarely happens.

Material could be store on site in a remote location, it could be delivered as it is used, or it might not even be available on the jobsite. The primary concern is to have the crafts person complete the construction activity as quickly as possible (William and Johnston, 2004:131).

They give guidelines for Material handling on the job sites as follows:

- Always move material with the least expensive Labour possible. Normally, the lowest paid members for the crew, such as a laborer, apprentice, or helper, should be responsible for moving material. The craftsperson, such as the carpenter, is paid a higher wage to do a specific type of work. The crews should be organized to avoid using the journeyman craftsman for moving material (Ibid; 131-135).

  Example, A wood framing crew consists of two journey man carpenters, a first-year carpenter apprentice and a laborer. The laborer and carpenter apprentice will move the lumber and equipment where necessary and the two journeyman carpenters will do the framing. Because the laborer and carpenters apprentice are not both needed 100 percent of the time to move material and equipment, the carpenter apprentice can assist the carpenters with the framing when not moving lumber and equipment. The laborer can collect scrap material and clean the worksite when not moving material & equipment (Ibid; 131-135).
- Deliver material as close as possible to the location of installation when possible, material should be stored near the installation location, making it ready for installation with out much extra labour. This is a common practice when gypsum drywall is “stocked” on the job site. The location where installation will occur (Ibid; 131-135).
- Deliver the material to its location with delivery people, material delivery to jobsite and even to the location with in the jobsite is most economically done by delivery people employed by the supplier of material. Although there is normally delivery people employed by the supplier of material. Although there is normally delivery charge, the material jobsite labour. The delivery crew know how to handle material efficiently and usually is interested in the prompt delivery of material. The delivery truck often comes with a boom or fork attachment that assists in the placement of the material. For example, dry wall is normally delivered & “Stoked” by the delivery crew. The crew will floors. They also can used the fork boom on the delivery truck to deliver dry wall to a second

floor opening, if desired. With in unionized jurisdictions, however, delivery people usually will not union employees union laborers would chain material movement on the jobsite, under union. Jurisdictions, only certain union crafts people can move material or equipment on the jobsites. Usually Laborer will have the authority to move material or equipment on the jobsite. Usually laborers will have the authority to move material, while operating engineers run the lifting equipment. Some traders, however, move there own materials, depending up on the language in the agreements. To avoid jurisdictional disputes, the contractor should realize which craft clams each of the tasks on the jobsite. (William and Johnston, 2004:131-135)

- Deliver from the truck to the installation location, if possible. There are some instances when delivery can be made from the delivery truck to the material installation location. This is often done with structural steel. The steel fabrication, such as a column assembly, is lifted by the tower crane directly to the installation location and immediately bolted into place. Large equipment, truck to its ultimate destination. This method avoids on-site storage of material and is utilized extensively when little or no on-storage is available. Extra coordination is needed, how ever, to the time needed and the installation location is ready for the material or equipment upon its arrival (Ibid; 131-135) .
- Avoid moving the material more than once. When material is stored or stockpiled or site, it should go from the storage area to installation. Too often on construction sites a storage, pile of material has to be moved to another location because of other storage needs, providing access to work or excavation, or for any other number of reasons. Material piles rarely need to be moved if prior planning is done. Anticipation of the work schedule and delivery of material can help create a storage plan that does not need to the changed during the project. Material that is placed haphazardly on the jobsite usually results in relocation of material prior to its installation (Ibid; 131-135).
- Anticipate equipment need for the entire project and ensure that the proper equipment is available. The contractor should anticipate the amount, size and packaging method of the material and have the appropriate means of moving the material on the jobsite prior to delivery. Planning at the start of the project can provide adequate provisions for lifting equipment through the duration of project. Permanent equipment should be selected for

the majority of lifting and material handling some equipment need may be temporary and require special machinery such as a mobile crane, for a few hours or days. Due to the size, location, or amount of material deliver to the jobsite. Some lifting equipment will be the subcontractor's responsibility, such as the crane for erecting structural steel or for lifting a chiller unit to the roof of the building. Although the subcontractor is responsible for the const of the lifting equipment, the general contractor should provide allocation for the lifting equipment and for the delivery of equipment. The contractor must consider all of the material that is to be installed on the project, including that furnished by sub contractors, when establishing a job site plan (William and Johnston, 2004:131-135).

- Select the optimum equipment for moving the material. There are many ways to move and lift material into place. Most construction lifts and moves can be performed manually rather than by using a crane, forklift, or other method cost, of course, is the prime consideration, but a number of other factors should be considered. The following aspects should be considered when analyzing how to use equipment (Ibid; 131-135):-
    1. Cost: The rental cost of the necessary equipment, including minimum rental (4 hours, 8 hours and so on) time and travel time to and form the jobsite should be considered. All necessary accessories, such as rigging and chokers, should also be taken into account.
    2. Availability: The availability of lifting equipment with in the community. A one-time lift may appear to require a piece of equipment that is not really available within the community. Any piece of equipment can be shipped to a community, but the shipping cost may greatly exceed the cost of an alternative. Some times, for small lifts, a gin pole with a block and tackle can replace a crane that is not available in the area. For example, when setting a precast bridge section, a contractor needs a large mobile crane to set the precast section. The mobilization cost to bring the crane into the community is quite expensive. Thus, the contractor uses two smaller cranes, one on each side of the river, resulting in a quick, efficient pick for a much lower cost.
    3. Capacity of the equipment: The contractor needs to be sure the equipment has the appropriate capacity, including the safety factor to move and lift the equipment

necessary. Cranes are selected according to the location of the pick an the designated target. Each piece of equipment has a certain capacity that should be taken into account with exact jobsite conditions. All of the qualities of the equipment need to be considered, including load capacity and the reach or size of the equipment.

4. Safety: Safety is of paramount concern on the jobsite. Safety considerations always supersede cost issues. A more expensive method may have to be used to protect workers form a more risky one. A little more expense during the initial lift is a much better investment than a lift or move that endangers the lives or well-being of the workers.
5. Quality of material: The relative quantity of material to be moved also is a factor when deciding what equipment to use. High mobilization costs can be absorbed if a large amount of material is to be moved. For small quantities, the contractor will probably use a labor-intensive method, rather than pay travel or set up fees for lifting or moving equipment.
6. Access to the point of use. Situations arise where equipment must be used because access is not closed to the point of use. The most efficient and cost-effective way to pour concrete is to do it directly form the ready-mix truck in to the concrete from. This is not always possible, as the form may be too far from the nearest truck access or above the pouring level of the truck, requiring alternative methods, some of these methods, might include a series of gravity chutes, a concrete pump, a bucket lifted by a crane, or possibly a conveyor. Having the space for delivery of material and sufficient room for trucks and vehicles to maneuver also should be considered. This analysis is made by considering the factors discussed in this section.
7. Provide adequate delivery routes. The route for delivery should be clearly marked from the amen roads and streets to the jobsite entrance, Construction sites often are located in remote areas, but firm and well-maintained roads to the point of delivery are needed. The majority of delivery truck to the construction site are

semi-truck-trailer setups, requiring wide turns and standard roadway width. The roadway, even if it is temporary, needs to be firm and stable.

2.10 Traffic and Transportation of Materials

Traffic management is a big job in most industries. In the typical manufacturing company, transportation services are the third greatest expenditure, only purchased materials and labour are more important. Producers of bulky, low-cost materials may spend as much as one –fourth of their sales dollar on transportation, and even those who produce items of very high value may directly or indirectly payout 5 or 10 percent of their sales dollar for transportation services (Kumar, 2006:323).

Most large companies have a separate traffic or physical distribution department. The traffic manager is major executive, in some cases he reports directly to the president of the company. Even when he does not, he may be only one echelon lower in the organization, reporting to the material manager, purchasing manager, or marketing manager. Growing recognition of the importance of the physical distribution function is not only upgrading traffic but bringing it closer to related material activities (Ibid; 323).

Most organizations, however, rely on common carriers for most of all of their transportation needs. In the economic sense the common carrier is like any other supplier the company might have. The carrier performs a service and gets paid for it. The main difference is that common carriers whose vehicles cross state lines are very tightly regulated by a federal government agency, the Interstate commerce commission, as well as by various state agencies (Ibid; 323).

Were not for the unique character of its regulation, transportation services would probably be just another purchasing function in most organizations. However, complex regulations make transportation purchasing sufficiently different form conventional purchasing activities so that in larger companies it usually not carried on in the purchasing department but in a separate traffic department (Ibid; 323).

2.11 Risks Involved in Material handling

Material handling involves the following risk Damage payment when a company does not load or unload freight cars with in a limited time period, wasting of machine time, when manual loading and an unloading care slow or men and machine must stop producing casing no body is taking away the finished products: misplacing of materials in to lot production systems, serious damage to parts and products (some materials like paper and sugar must be started in a warm, dry places others like milk and cheese must be stored in cool, moist places, some, like the cream and frozen foods, must be frozen. “Fragile handle with care”

Disruption of production schedules, In mass production system. If just one part of the assembly line is staved for parts, the whole assembly line must come to a half. Customers Dissatisfaction (What they does not receive on time as promised or if they receives products, which are damaged in the production process, or when they are delivered to them problems of workers safety a (worker crushes under loads which have tapped or shifted a worker burred by hot materials (unpublished materials).

2.12 Factor Influencing Material Handling

As material handling process can not have viewed in isolation, stated Gapalakihhnana and Sunderson (1997) there are generally four factors which affect the material handling decision these are: the type of production system, the product to be handled, the type of building with in which the material handling is to be done and the cost of material handling devices Gapalakihana and Sunderson 1997:112).

Many factors like plant layout, process and nature of raw materials and products influence the material handling process. The objective therefore, must be to obtain maximum over al effectiveness in material handling process. Many decision such as layout decision (production or process layout) and industrial engineering techniques have a significant effect on the effectiveness of the materials handling system. These methods can result in cost saving, reduction of investment on equipments and reduction in production cycle time. Similarly, when layout and material handling are designed in an integrated manner valuable insights can be

developed in the section of handling equipments, number of equipment and maximum utilization of floor space.

2. 13 Obsolete, Surplus and Scrap Management

Obsolete items are those materials and equipment which are not damaged and which have economic worth but which are no longer useful for the company's operation owning to many reasons such as changes in product line, process, materials, and so on. Surplus items are those materials and equipments which have no immediate use but are accumulated due to faulty planning, forecasting and purchasing. However, they have a usage value in future. Scrap is defined as process wastage, such as turnings, borings and flashes. They may have an end-use with in the plant. In any case they have a market value (Gapalakihhnana and Sunderson, 1998:177).

2.13.1 Surplus form Scrap and waste

Even if a company is well- managed, some excess, waste, scrap, surplus and obsolete material are bound to develop. But every organization tries to keep such materials at minimum. However this never will be wholly successful. In most production process all materials are not wholly consumed, frequently residual is left. This excess, called scrap must be disposed of a surplus. It is difficult to eliminate this type of surplus, however, using intelligent planning and effective production control can minimize it (Leender, use Fearon, l989 P.P. 286).

Insufficient of production machinery, carelessness and poor purchasing are also cause of surpluses. This is called waste.

2.13.2 Surplus form Obsolete or Damaged Stock

So many changes are made consistently in the design and specification of fast moving technological products. As a consequence, obsolete products and their pans constitute a major source of surplus materials excessive. In addition to these excessive or forward buying is another common source of surplus materials. Advanced or forward buying entails the hazarded of surplus generation form obsolescence, deterioration excessive inventory. Any warehousing operation

without considering how efficiently is controlled and errors in record keeping (Lenders, Fearson 1989:387).

2.13.3 Disposal of Scrap

According to Gapalakihhnana and Sunderson (1998), disposal of scrap when handled in an imaginative manner can result in handsome returns to the organization. An effective disposal requires a compact disposal organization reporting to the material manager, continuous market survey on the price of various categories of scrap generated in the plant and constant touch with the industries. Which generate similar scrap and with end-users (Gapalakihhnana and Sunderson, 1998:180).

Disposal action follows when the scrap cannot be utilized with in the organization. In practice, it has been found that it is profitable to dispose the scrap directly to end-users rather than to middlemen who normally form a cartel of their own which leads to lower returns. Before Disposal action it is essential that the scrap is segregated according to metal, size, etc. when the scrap is mixed, the return is even lower than the lowest element in the mixture. This is because the buyer of scrap will have to segregate it at an extra cost (Ibid; 180-181).

Many Methods are used for disposal. Two methods which are frequently used are by auction and by tender. Parties in both the cases are normally required to inspect the scrap in the scrap yard and deposit earnest many. Very often the company insists on a basic price depending upon the category of scrap. The disposal section works, in this aspect in close coordination with the finance department. In may cases the disposal section may try to enter in to along term contract with end-users such as steel plants (Ibid; 180-181).

Many companies have found to their displeasure scrapped components appearing the market and competing with their parts as “Original equipment”. This is the price which organizations pay for not dismantling and disfiguring the scrap before disposal. Automobile spare parts and bearings especially are prone to such dangers. For this purpose some organizations go to the extent of requesting vehicle users to demolish filters and plugs before scrapping them. This is a very important aspect (Ibid; 180-181).

They finally suggested that in view of the paucity of raw materials and shortage of credit, it is necessary that optimum usage of materials is made and funds tied up in obsolete surplus and scrap item minimized. This is only possible when top management shows commitment and support. The employees of the organizations are naturally the best people to suggest, improvement in materials, processes and new end-users for scrap. It is they when can minimize the accumulation of scrap through coordination. Therefore, top management should work out formal reward system to promote employee participation in this matter. A few organizations systems to promote employee participation in this matter. A few organizations have suggestion box schemes which pay rich dividends to the organization. Employees, too, get rewards and recognition in the process (Ibid; 180-181).

2.13.4 Organization for Management of Surplus

Nearly all manufacturing firm (large and small) and many nonmanufacturing firms should have a salvage and reclamation (S and R) department depending on the Quality and value of the salvageable material involved, the department can operate full or part time either a salvage yard or the department head's desk. Many small firms regrettably fail to establish a salvage department. Primarily because they believe their Volume of surplus does not justify a full-time operation.

Industry loses millions of dollars annually by neglecting salvage and reclamation programs. For example a large electrical company, by recognizing its S and R department, recently increased its yearly savings by over 20 percent to roughly $ 1,200,000. A large university stated a salvage program and had sales of over $ 200,000 and savings of over $ 130,000 in the program's first year. A bank created additional profits of over $ 95,000 per year by correctly salvaging its waste paper. Many other firms could similarly benefit, but they fail to recognize the profit potential of salvage and reclamation programs.

The basic charge management gives to its salvage and reclamation department is to ensure that surpluses are disposed of with optimum profitability. To accomplish this all of a firm's surplus materials should be handled by its salvage and reclamation department.

2.14 Evaluation of Material Handling

According to Gapalakihhnana and Sunderson (1998:191) the effectiveness of the material handling system can be measured in terms of the ratio of the time spent in the handling to the total time spent in production. This will cover the time element. To cost effectiveness can be measured by the expenses incurred per unit weight handled. It can be safely said that very few organizations try to collate the expenses and time in this manner so as to objectively view the performance and to take remedial measures. Some of the other indices which can be used for evaluating the performance of handling systems and listed below:

Equipment utilization ratio is an important indicator for judging the materials handling system. This ratio can be computed and compared with similar firms or in the same firm over a period of time.

In order to know the total effort needed for moving materials, it may be necessary to compute materials. Handling Labour ratio (MHL). This ratio is defined as under :

$$MHL = \frac{\text{Personal assigned to material handling}}{\text{Total operating work force}}$$

In order to ascertain whether the handling system delvers materials to work centers with maximum efficiency, it is desirable to compute Direct Labour Handling Loss ratio. This ratio is:

$$DLHL = \frac{\text{Materials handling time lost by direct Labour}}{\text{Total direct labour time}}$$

The movement's operations ratio which is calculated after dividing total number of moves by total number of productive operations, indicates whether the workers are going through too many motions because of poor routing. It should however be emphasized that the efficiency of materials handling mainly depends on the following factors: (i) efficiency of handling methods

employed for handling a unit weight through a unit distance, (ii) efficiency of the layout which determines the distance through which the materials have to be handled, (iii) utilization of the handling facilities, and (iv) efficiency of the speed of handling (Gapalakihhnana and Sunderson 1998:192).

They concluded that an effective material handling system depends up on tailoring the layout and equipments to suit specific requirement. When a large volume has to be moved from a limited number of sources to a limited number of destinations than fixed path equipments like rollers, belt conveyors, overhead conveyors and gantry cranes are preferred. For increased flexibility varied path equipments are preferred (Gapalakihhnana and Sunderson 1998:192).

2.15 Store Management

Purpose of Stores

According to . (Gapalakihhnana and Sunderson 1998), stores pay a vital role in operations of a company. It is in direct touch with the user department in its day to day activities. The most important purpose of stores is to provide uninterrupted service to the manufacturing divisions. Further, stores are often equated directly with money, as money is locked up in the stores. The functions of stores can be classified as follows (Gapalakihhnana and Sunderson 1998:149):

1. To receive raw materials, components, tools, equipments and other items and account for them.
2. To provide adequate and proper storage and preservation to the various items.
3. To meet to demands of the consuming departments by proper issues and account for the consumption.
4. To minimize obsolescence, surplus and scrap through proper codification, preservation and handling.
5. To highlight stock accumulation, discrepancies and abnormal consumption and effect control measures.

6. To ensure good housekeeping so that material handling, material preservation, stocking, receipt an issue can be done adequately.
7. To assist in verification and provide supporting information for effective purchase action.

2.16 Location and layout

More often than not, in the matter of location the stores, materials management is rarely consulted. The normal practice is to locate the stores near the consuming departments. This minimizes handling and ensures timely dispatch. In stores layout, the governing Criteria are easy movement of materials, good housekeeping, sufficient space for man and material handling equipments, optimum utilization of storage space, judicious use of the storage equipments, such as shelves, racks, pallets and proper preservation from rain, light and other such elements. These problems are more important in the case of items that have a limited shelf life. Other important factors governing the location are the number of end users and their location, the volume an the variety of good to be handled, the location of the central receiving section and accessibility to modes of transportation such as rail or road (Gapalakihhnana and Sunderson 1998:149).

Since stores have to be nearest to the user, large organizations usually have stores attached to each consuming department, whereas receiving is done centrally. Items of common usage are stocked in the central stores so that inventory is kept at an optimum level. These factors are considered at the planning level of layout (Ibid; 149-150).

In the case of warehouses stocking finished goods, factors such as proximity to ports, railway lines, quality of roads, availability of power, etc., become quite important. It is also important that the stores are constructed with a futuristic orientation, so that sufficient flexibility for expansion needs is inbuilt. The activities of receiving the goods, stocking in appropriate locations, material handling and issues must be done swiftly and economically. The stores building must have adequate facilities for preservation of stores. Sometimes facilities, such as cold storage, heating equipments, air-conditioning and similar facilities may be required. These should be planned in advance. Comfortable working conditions must be provided to the stores personnel to get maximum efficiency and morale. The important factors in the design of stores building can be summarized as follows (Ibid; 149-150):

1. Lighting: Clear and adequate lighting is a must for a proper work environment. Lighting effects can be accentuated through a judicious choice of colors for the walls. For Sores personnel who work day in and day out in the stores receiving, checking, handling and issuing goods, a pleasing environment goes a long way in reducing monotony, Any attempt to reduce these facilities will prove to be false economizing in the long run.
2. Safety: This factor is perhaps the most important aspect. In stores a large volume of goods are handled every day. Accidents considerably reduce the morale and effectiveness of the system. The following measures are necessary if accidents are to be checked:
    a. Safety consciousness should be instilled in the minds of stores personnel through training programmers, visual aids and literature.
    b. Safety appliances, such as goggles, hand, etc., must be provided and their use must be encouraged.
    c. Good housekeeping is essential. This means that gangways must be clean, adequately wide so that movement of forklifts, trolleys and industrial tractors is smooth. Stocking must be in appropriate locations so that handling is minimum.
    d. All stores equipment must be kept in good order. This includes adequate maintenance practices with regard to forklifts overhead cranes, trolleys, conveyors, etc.
    e. Healthy competition can be stimulated by installing ‘safety awards’ and cash prizes which bring recognition to the concerned stores personnel for safety practices. This also motivates other to practice safety.
    f. Provision of fire fighting facilities is necessary especially where inflammable materials are stored and handled. In point of fact, large organizations have a well-maintained fire fighting equipment with the stores in preparedness. This has in the long run reduced losses and reduced insurance expenses. Fire extinguishers, fire escapes, alarms and sprinklers must be available and personnel should be familiar in handling them.
    g. Other factors which merit attention include provision of toilets, routine maintenance equipments, safe electrical wirings, etc.

2.17 Store Systems and Procedures

Broadly the systems in stores can be studied under there areas, namely, receipt, stocking and issue. Well designed stores systems and procedures ensure timely information for decision-making, particularly because stores is the staring point of all activities for control. Let us briefly consider the systems and procedures in each area (Gapalakihhnana and Sunderson 1998:154).

Receipt System

This can be divided into receipts from outside suppliers and receipts from internal divisions. Systems for receipt start even before the time when the material actually reaches the plant. When a purchase order is placed, a copy is sent to the stores, indicating quantity an delivery date. These should be arranged in a chronological sequence so that the stores manager can at any time estimate the volume of receipt. This also helps in planning labour contracts when unloading activities exceed a particular limit. This is the first step in the stores system. Secondly, suppliers, once they dispatch the good normally send an advice note to the stores. This provides information on the date of dispatch, carrier details, description of the consignment and value. This is sent in advance so that quick and easy clearance may be done. The third stage is the document prepared bye the transport carrier. Very often different suppliers employ different transport organization for transportation of their materials. These transport organizations usually send consignment notes to the stores concerned. Railways and private transport organizations are examples in this respect. These three documents, namely, copy of the purchase order, supplier's advice document and the consignment note, enable the stores manager to organize and plan for expeditious clearance of materials and minimize costly demurrages. In some cases, suppliers send a packing slip detailing the contents in the package (Ibid; 154-160).

Physical Systems

When the anticipated day of delivery comes, the above documents are tallied for identity of figures with respect to quantity and value. When the consignment arrives it is identified with the help of these documents. Then it is physically verified using weighbridges, measuring devices, tapes, etc. When the volumes of receipts are high, this process could be unwieldy and may prove

to be a bottleneck. In such cases arrangements are made for inscribing the tare-weight of the trucks and wagons. This reduces frequent weighing. When there is no significant difference between the actual amount and the amount shown in the three documents, the consignment is sent for inspection. If shortage is observed then it calls for additional procedures. The time element is very important as shortage claims will not be honored when they are time barred. Therefore, the documents are prepared and indexed date wise detailing the quantum of shortage and value. This may required the stores personnel to take open delivery in the presence of the transport organization's official and get the shortage endorsed (Gapalakihhnana and Sunderson 1998:154-160).

Storing Practices

At the end of the receipt and inspection stage, stocking follows. This is the most under-rated function in stores management. Stocking involves routine activities like storing out materials coming at the end of inspection process and storing them in their locations. In big organizations, the volume and variety of materials to be stocked are so high that areas with in the stores demarcated as follows (Ibid; 154-160):

1. Area where materials are to be stocked for inspection (This is usually earmarked near testing laboratories and inspection outfits);
2. Area where materials coming out of inspection and accepted for use within the plant are to be stocked; and
3. Area where materials rejected are to be stocked so that they could be dispatched to the suppliers concerned. (This is located near wood working section and sidings for suitable packing and onward dispatch).

Stocking is very important for easy location, proper identification, and speedy issue to the consuming department. This process is very crucial in warehouses where thousands of parts are stocked for meeting consumer needs (Ibid; P.P. 154-160).

Another important aspect is the need to specially stock excisable items. Certain items are subject to inspection by government authorities before issue to consuming departments. For this purpose bonded stores are used. This is noting but a special store within the main stores enabling easy identification of such items (Ibid; P.P. 154-160).

Issue control

We now come to the final stage, namely, issues can be further divided into issues to consuming departments, and issues to outside suppliers for processing or conversion. (Gapalakihhnana and Sunderson 1998:154-160).

In both cases there are certain common system requirements. The first aspect is the control of issues. Issues are based on production programmers. Based on this and the bill of materials, work orders are printed, listing for each material, quantity to be issued against each component requiring that material. This automatically controls consumption because the work order gives details on quantity of materials to be issued and the corresponding quantity of components to be manufactured. So any materials requirement over and above that indicated in the work order quantity means excessive wastage and scrapping. Normally, stores personnel at junior levels are not authorized to issue beyond work order quantity. This automatically focuses top management's attention. Thus there is an inbuilt control. Sometimes materials are issued on loan basis. Proper control through stores registers must be ensures in such cases (Ibid; P.P. 154-160).

The second aspect is delegation of authority. Direct materials for which consumption norms can be established are controlled by work orders. For direct materials, such as fuel oil, electrodes, oxygen and tools, it is obvious that control should be based on past experience and suitable delegation. The stores assistant may authorize issues up to Rs 1,000. The stores officer's limit may be Rs 5,000 and so on. This establishes responsibility in controlling consumption. Ad hoe material requisitions are sometimes made. Periodically consolidated statement of such items must be prepared. Serial number controls are to be maintained and issues, as also receipts, must be posted in kardex so that stock balances are up-to-date. The need for updating the records cannot be overemphasized as the stores; record is the stating point of inventory management in all organizations (Ibid; 154-160).

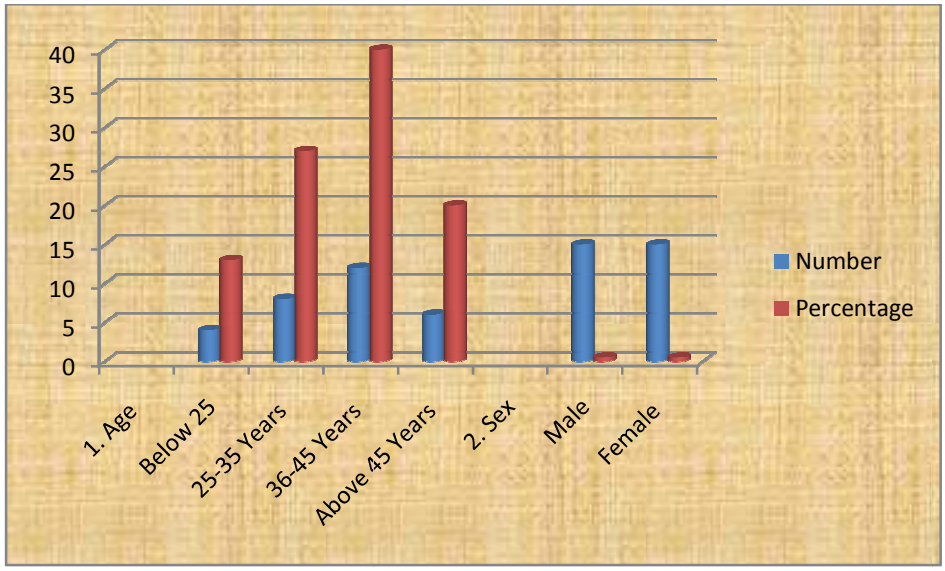
CHAPTER THREE

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

In this section a detailed analysis of the company over all material handling and disposal are discussed. The collected data through questionnaire and interview was codified and tallied depicts the frequency distribution. The data gathered through documentary consultation is narrated in this analysis, however among the 36 respondents only 30 filled and returned back the questionnaires while the rest failed to respond.

3.1. General Characteristics of Respondents

Chart 1. Age and Sex Distribution of the Respondents

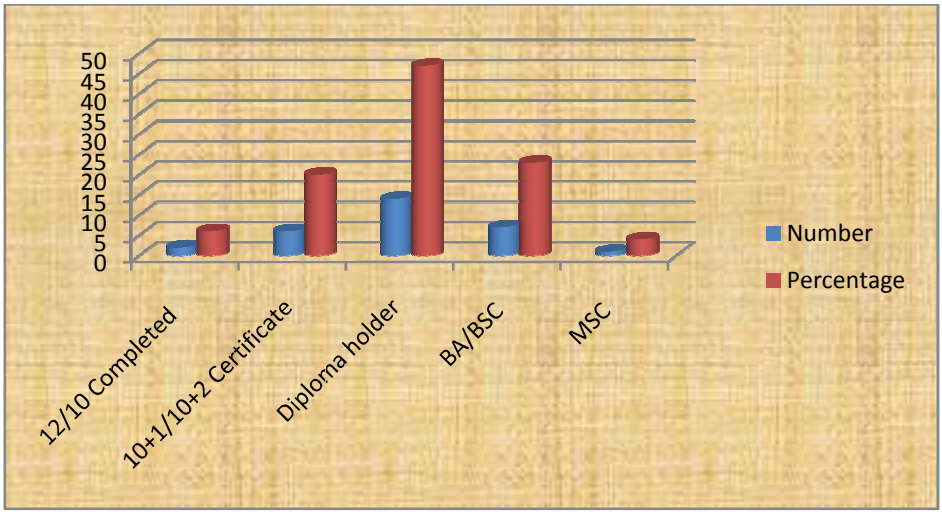


From the above chart No. 1 Item No. 1 focuses on the age distribution of the respondent where majority 40%(12) of them are with in the age of 26- to 45Years, 27%(8) of them are with in the age of 25-35 Years, 20%(3) of them are above 45 Years and 13%(4) of them are below 25 Years. This indicates that majority of the staffs are matured to provide valuable responses to the question raised and there by reducing possibility of biasness with that regarded.

Chart No.1 Item No. 2 depicts the sex distribution; out of the total respondents 50% of male and 50% of them are female. From this data we ca n understand that sex distributions of respondents are equal.

3.2. Educational Background and Experience of the Respondents

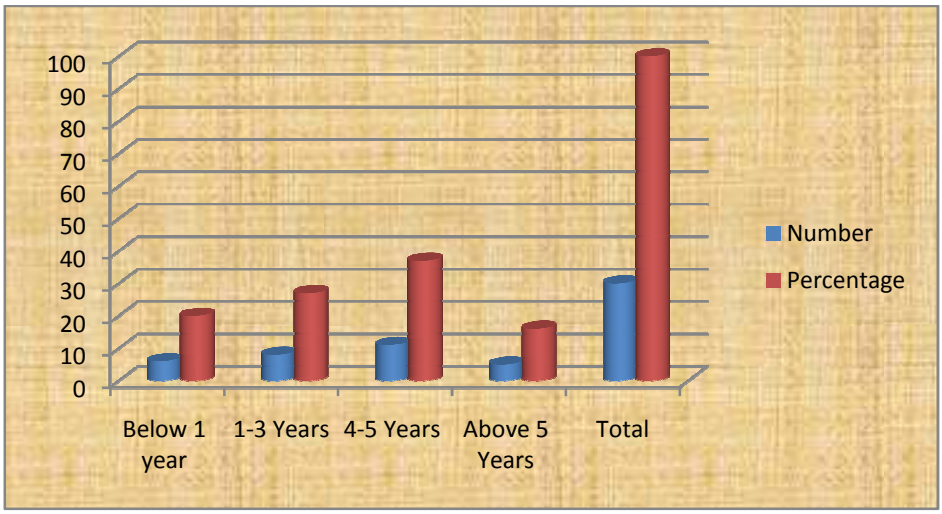
Chart 2. Educational Background of the Respondents



According to chart No. 2 it enables us to understand the education level of the workers of the company. Accordingly, from the total 30 respondents, the majority which accounts 47% (14) are diploma graduates, followed by 23%(7) above 1st degree, 20%(6) employees are certificate hollers, and 4%(1) above 2nd degree. In addition to the education qualification, equity of the gender is observed.

From the above observation we can say that most of the employees are diploma holders, As a result of this it can be interpreted that the workers can provide effective services for users and handle properly material of the company.

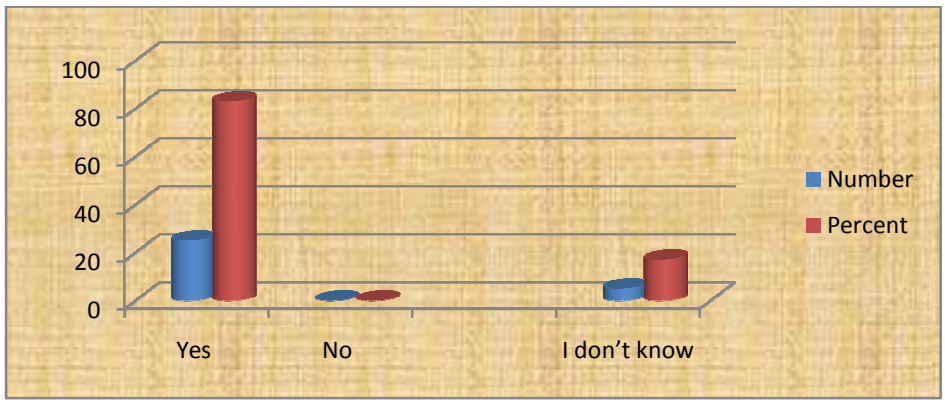
Chart 3. Experience of the Respondents



From chart No. 3 the researcher was designed to identify respondent's year of the service in the company. Accordingly, 16% (5) of them are less than 1 Year, 27% (8) of them are 1-3 years, 37% (11) of them are 4-5 Years and 20% (6) of them are above five years. From this findings, we can understand that majority of the respondents have long service years in dealing with activities of material management in the company. Hence with degree of confidence respondent can say something about the material handling and disposal of the subject of the study.

3.3. Assessment on handling material in a planned and orderly manner

Chart 4. Assessment on handling material



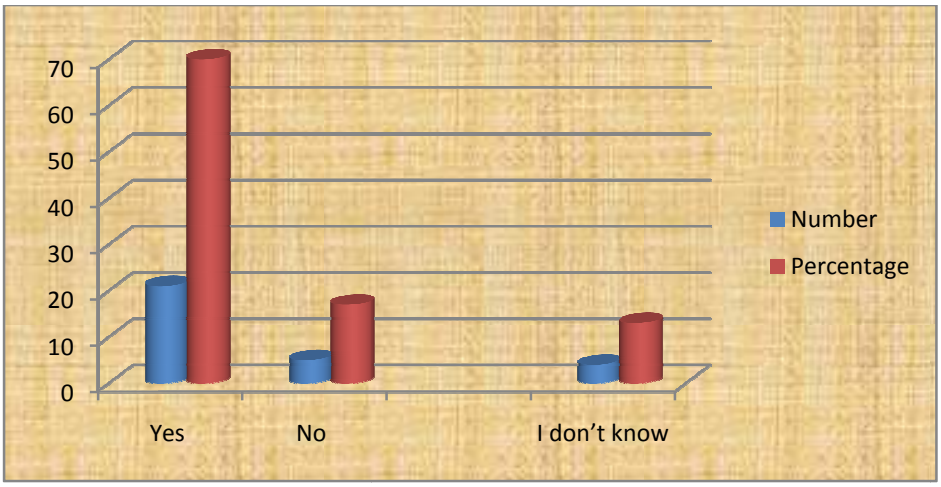
1Does the company handle material in planned and orderly manner?

This chart shows that majority of the respondent which is 83% (25) of them are responded that "yes" whereas 17% of them are noted "I don't know" whether material handle in a planned and orderly manner or not. This Shows most of the employee who are in store management section agreed that the company handle material in a planned and orderly manner.

Even though, there is no well organized manual in the company to handle material, people who is working in the department are handle material in a planned and orderly manner as much as possible.

3.4.Availability of Work Procedures for employees assigned on material handling and disposal.

Chart 5. Availability of Work Procedures



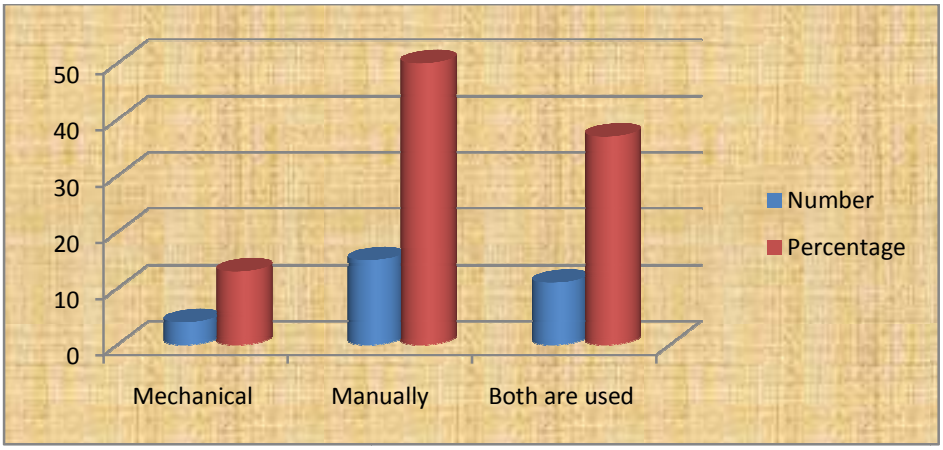
2 Are there work procedures for employees assigned on material handling and disposal in your organization?

Regarding the availability of Work procedures on material handling and disposal, as it can be seen on the above chart, 70% (21) respondents have noted "yes" whereas 17%(5) respondents have noted "no" the rest noted that they do not know whether there is a procedure or not in the company.

Form the above illustration more than half of the workers know that there is a work procedure on materials handling and disposal. In most of the material handling procedures, basic materials handling principles are included. As per the assessment, the researcher privileged to see the material handling procedures. The researcher can interpret that the company contains almost all the basic materials handling principles. As indicated in the literature review of these study materials handling principles even though they vary from organization to organization its availability is compulsory. Hence, the company under consideration in this study has its own principles suitable for its performance.

3.5. Application of the material handling and disposal management system that the company applies.

Chart 6. Application of Material handling and disposal Management system

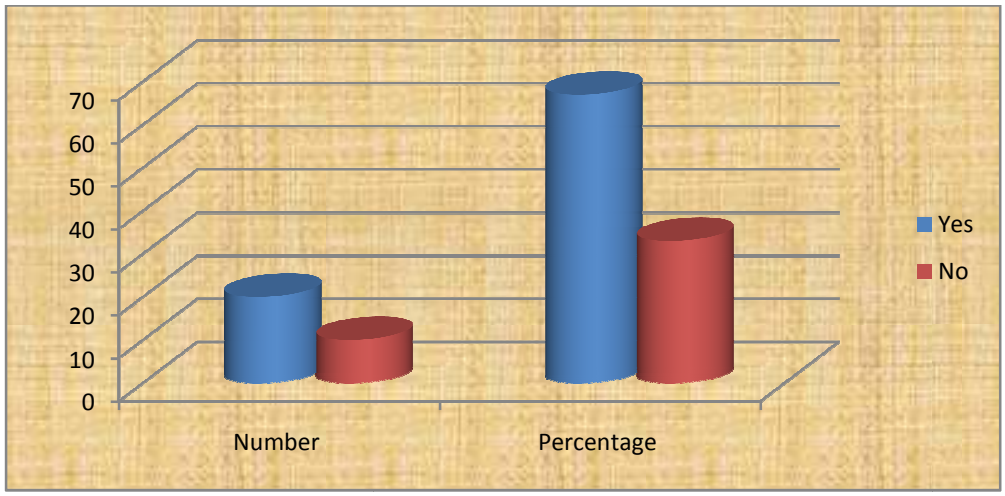


3 Is there a system in Material handling and disposing Management?

Having a ground on the system on how to handle and dispose material the research has further conducted a study on the system. Thus, a total number of 13% (4) respondents have reacted to the availability of mechanical device. Another group of respondents 50%(15) have noted that there is no mechanical system where the system utilize that department perform recording manually. The rest 37% (11) workers have indicated that both systems are used to handle and dispose materials. This shows that the company use mechanical device but it is not enough to handle material effectively.

3.6. Analysis on utilization of computer in the process of material handling and disposal.

Chart 7. Analysis on the utilization of Computer



4 Does the company utilize computerized stock recording?

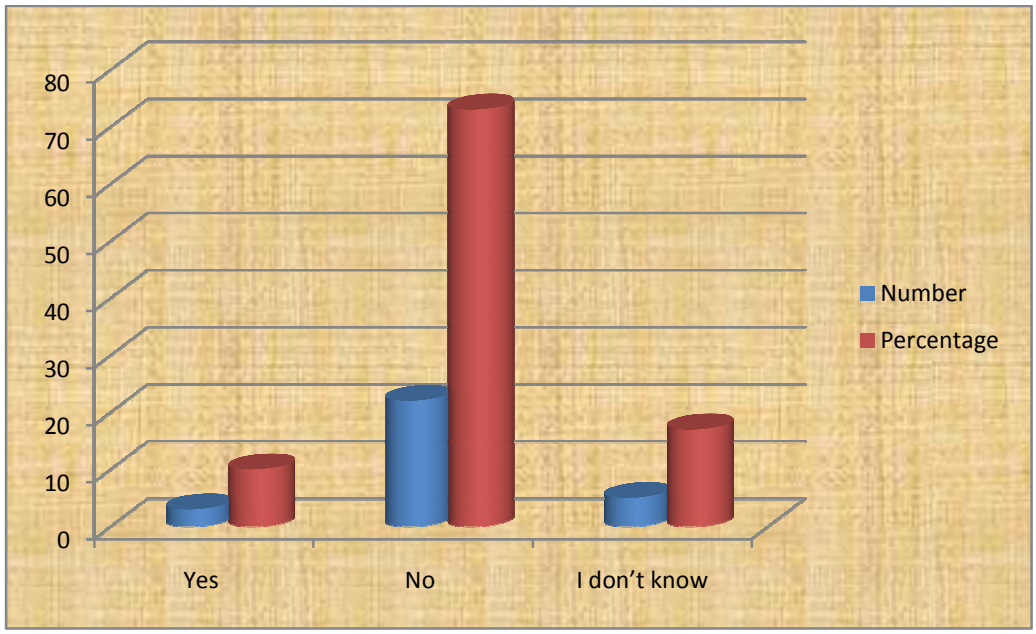
An organization should accept technology for the result of the achievement of the goal. Computerizing an organization can increase the profit. The technology as an important factor helps to enhance work performances.

In this connection, the above chart describes the material recording system of the company. It illustrates 20(67%) that of the respondents' replied that their material recording system is performed with computer. On the other hand 10 (33%) of the respondents replied the recording system is manually performed.

This shows that the company is trying to solve the problems regarding updating material records, planning required materials, store management, clerical work process that takes unnecessary extra time in provisioning and delivery of materials.

3.7. Assessment of employee working in Material Management area trained in material handling and disposal System.

Chart 8. Assessment on training of employee



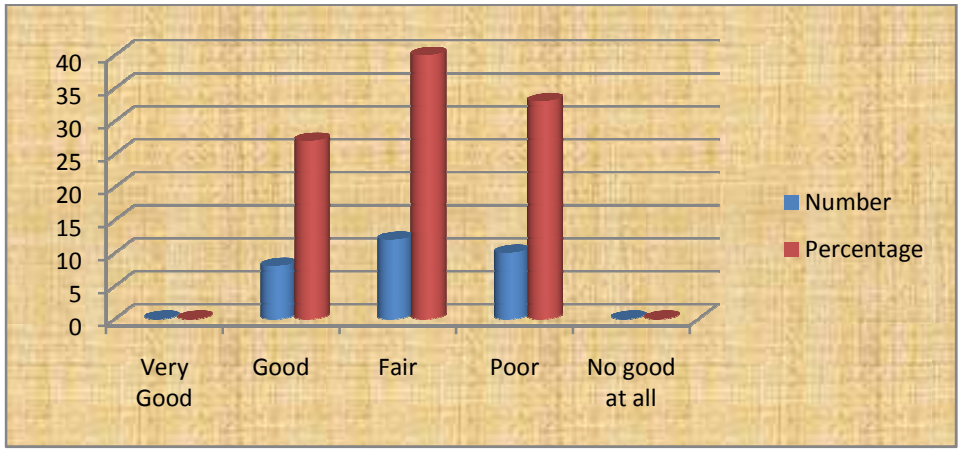
5 Are the employee working in material management area trained in materials handling and disposal system?

Regarding the availability of training on material handling and disposal, as it can be seen on the above chart, Majority of employee which is 22(73%) who is working in material management section responded that there is no training at all. Whereas 3% (10) respondents have noted “yes”, the rest noted that they do not know whether there is training or not.

This shows that the company does not give much attention on training of employees who work on material management section.

3.8. Analysis of working environment for employee who's working in material handling department.

Chart 9. Analysis of Working Environment



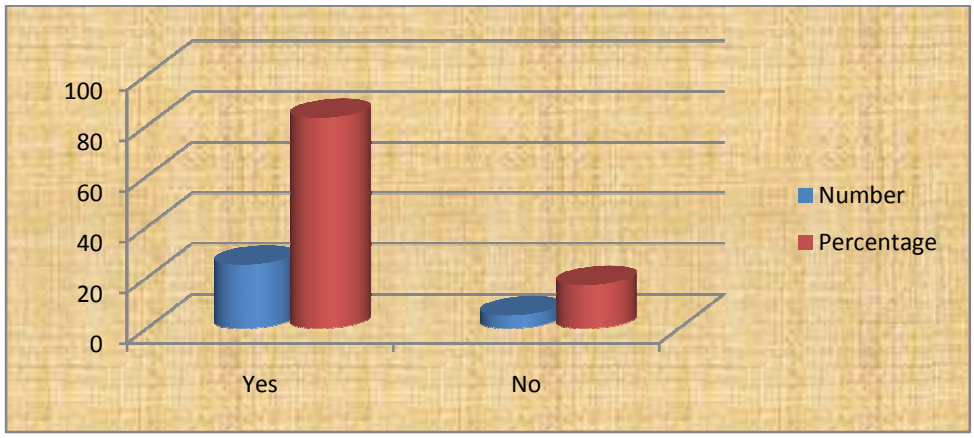
6 How do you see working environment for those employees working in materials handling department of your company?

This chart shows that 27%(8) of the employee responded that good working environment are there 40%(12) of them are responded fair and 33%(10) of them are said poor.

The majority of employees are agreed that there are fair working environment. This shows that the company does not much consideration for working environment of those employees working in material handling department.

3.9. Assessment on the materials which are locked up by capital

Chart 10. Assessment on the Materials which are locked up by capital



7 Are Material locked up by Capital?

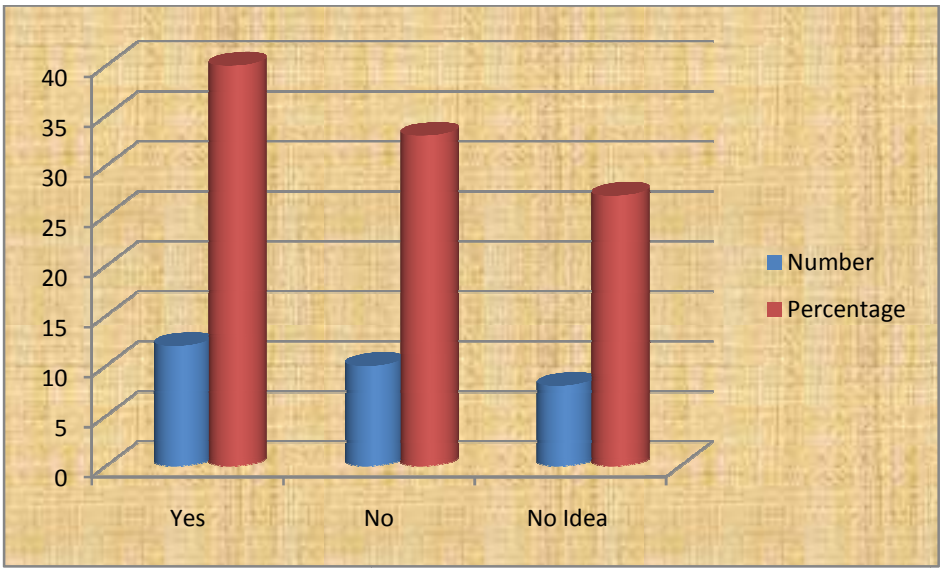
Respondents were asked whether the company keeps material which can lock up capital or not. Thus, a majority which is 25(83%) of them give positive response while the rest 5 (17%) responded differently.

Besides, the yes or no answers many respondents give more explanation in the locked up capital matter. There are:

- Plan or schedules are not made to purchase materials.
- Having different project dalliance occur in the process of handling over material.
- Disability of making decision, nobody wants to take responsibility of the obsolete materials.
- Lack of accountability and attention is observed

3.10. Assessment of proper coordination among work unit who are responsible for material management and other section of the company.

Chart 11. Assessment of Proper Coordination among Work Unit



8 **Is there proper coordination among work unit who are responsible for material management and other section of the company?**

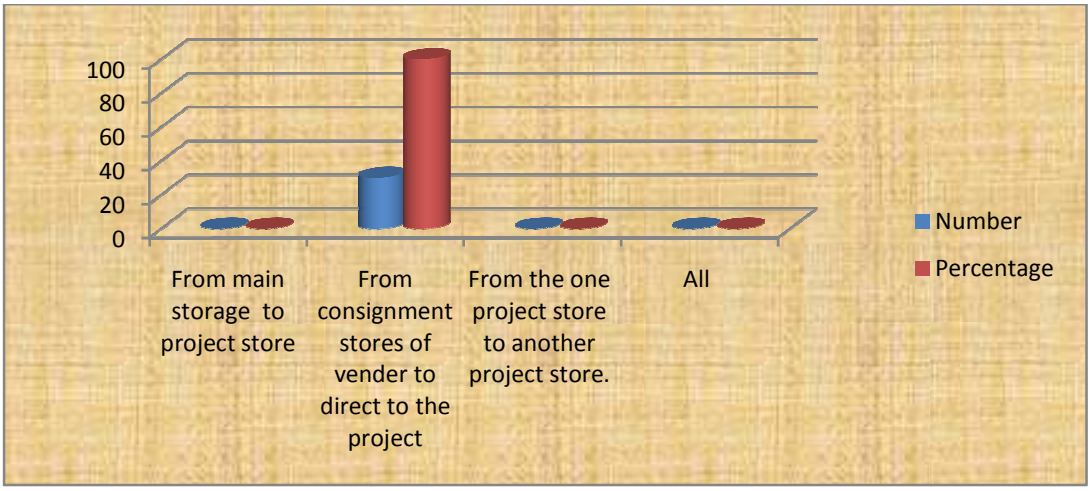
The above charts show that the relationship between material management section and other section 12(40%) of the respondent responded that the relationship between section is positive

while 10(33%) of them replied negatively. And 8(27%) of them replied that they do not have any idea.

From the above description it can be understood that, it is difficult to monitor stock level regularly without establishing proper relationship among the section. This criteria dissatisfaction of the users in store service provided from them. There is also a problem arising from over stocking which lead to substantial tied up of capital. There are materials that are not purchased on the basis of minimum and maximum balance considering the recorder quality level, like spare parts of different materials. This in turn creates materials to be stored for a longer period evens the extant of losing material usage value. There is lack of updating of stock list which result inefficiency in material issuance and incurs high carrying cost of inventory. There is no review of items in Block to high light obsolete or surplus for appropriate action to take. This implies that there is serous problem in creating interface between materials stocking and issuance such interface has a key role in bringing about efficiency in terms of utilizing materials appropriately which results in having the right material only by avoiding overstock.

3.11 Assessment of the transportation of Stock.

Chart 12. Assessment of the Transportation of Stock

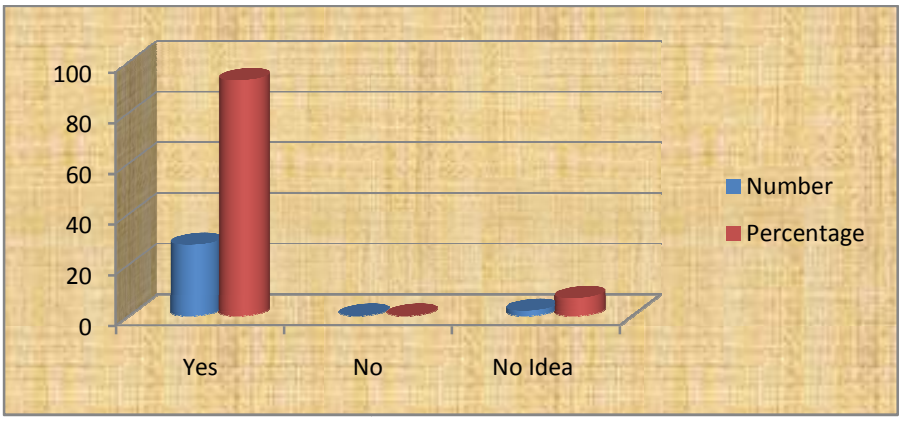


9 **Which of the following stock transfer are relevant for the use of material economically?**

This chart shows that all of the respondents agreed that stock transfer from consignment stores of vender to direct to the project is economically good. However for the controlling purpose stock transfer form the main store to the project is applicable in the company.

4. 12. Handling scrap and obsolete materials?

Chart 13. Assessment on Handling Scrap and Obsolete Materials

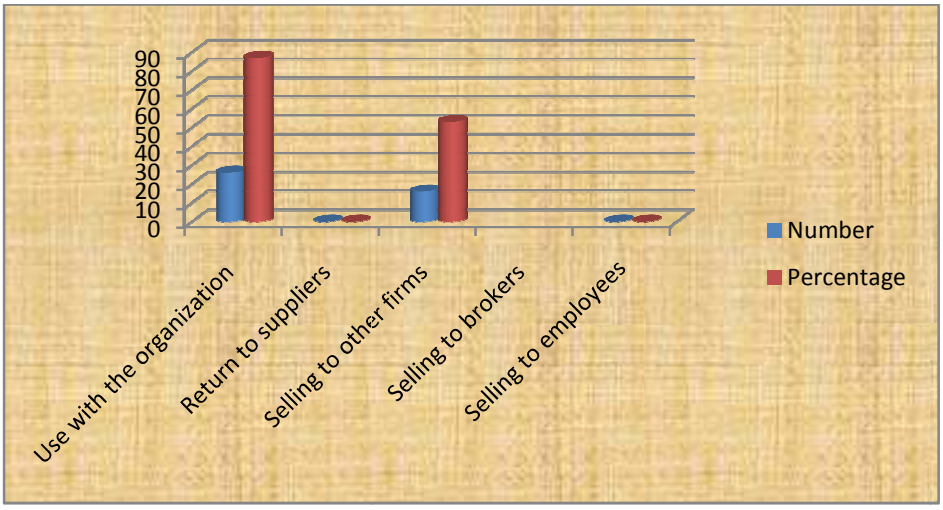


10 Does the company hold scrap and Obsolete Material?

Regarding the availability of scrap and obsolete materials, as it can be seen on the above chart, 28(93%) of them have noted "Yes" and the other 2(7%) of them are responded that have no idea. This means that the company holds scraps and obsolete materials.

3.13 Assessment of Work procedures to dispose stock left over's

Chart 14. Assessment of work procedures to dispose stock left over's

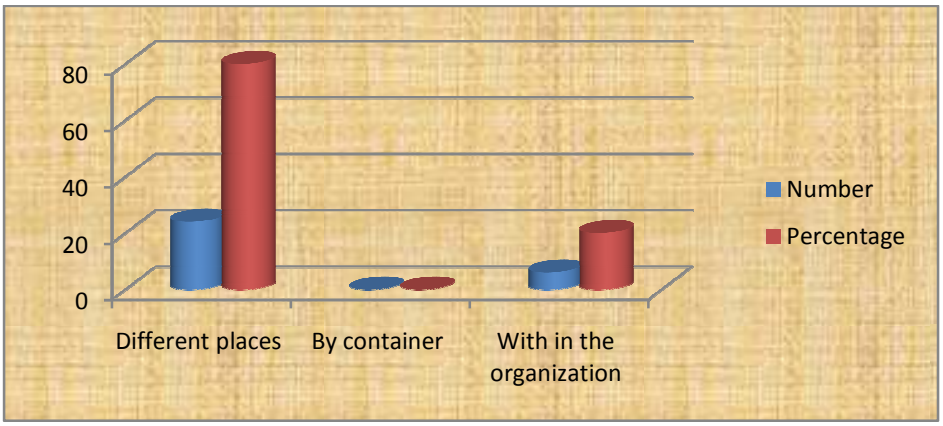


11 What procedures is employed to dispose stock left over's?

From the above chart almost all employee responded that scrap and obsolete material are use within the organization and some times sold to another firm. This implies that the firm use obsolete and scrap material for additional resource and the company can get another income.

3.14. Assessment on placement of disposal materials in the organization.

Chart 15. Assessment on placement of disposal material

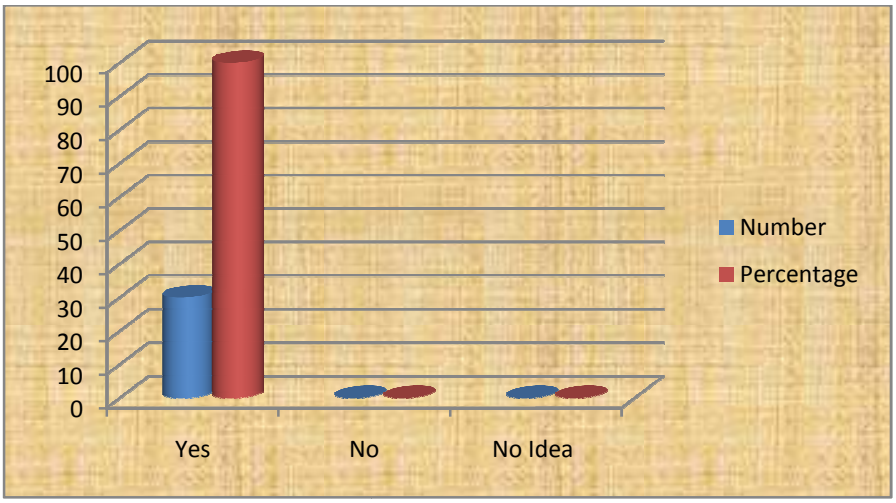


12 How the organization place materials to be disposed?

The above charts show that 24(80%) of the respondent noted that disposal materials are placed in different places and 6 (20%) of the respondent said that placed in the same store. From the above description, the company did not give much attention on the disposal of material.

3. 15. Availability of a fixed inspection and verification period.

Chart 16. Availability of fixed inspection and verification period.



13 Does the company have a fixed inspection and verification period?

The above chart indicates that all respondents unanimously agreed that there is fixed inspection and verification Period and said that the inspection period is at the end of the physical year. Theoretically Jessop and Marrrison 1998:50 discuss that inspection is an essential tool in material management. Thus, the availability of fixed inspection in the company is a good sign that enhances the performance in the stores.

CHAPTER FOUR

SUMMARY, CONCLUSION AND RECOMMENDATION

4.1 Summary

The general purpose of this paper is to assess solutions that contribute to the subscribed problems of material handling and disposal system of the Issayas and Herouy Construction P.L.C.
The study focuses on the availability of material handling and disposal system in the company's management system. For a construction company like Issayas and Herouy Construction PLC well designed and efficient material handling and disposal system has a vital importance for the wellbeing of the company. The researcher has used questionnaire and interviews as grounds of statistical data gathering techniques.

Using the above mentioned techniques the data's were gathered analyzed and interrupted accordingly. Finally the following major findings are observed:

- The major finding that the researcher has proved is that the unavailability proper work procedure in material handling and disposal system. Most of the employee or 21(70%) of the employees have responded that there are procedures in material handling and disposal system, whereas 5(17%) responded that there exist no such system. While 4(13%) of the employees do not have any idea whether there is a procedures of the company or not. On the other hand the section heads have claimed that there is no well designed and recognized material handling procedure.
- Of the respondents 22(73%) of the employees approved that they didn't take training whereas, 3(10%) of the respondent agreed that they obtained training and 5 (17%) of the respondent have no idea whether there is training or not. The majority of employees who are working in the warehouse are not getting proper training on the material handling and disposal system and what is given is not distributed fairly among the employees.
- From the questioners and interviews there is an indication of capital being locked on materials which are absolute and excessively stocked for years. This is confirmed by 25(83%) respondents out of the 30 respondents.

- The respondents were asked about the prevalence of good coordination among material control and other sections. The majority of the employee or 12(40%) of them took a position that there is no good coordination between sections. Whereas 10(33%) of them agreed that there is good coordination. However, 8 (27%) of them have expressed that they have no idea.
- The mechanical device in the store department is not good enough to handle materials properly. Half the respondents, 50% (15) have indicated that there is no mechanical system and the section is recording stocks manually. While the other 13% (4) of the agreed that there is a mechanical device in use. On the other hand 37% (11) have indicated that both systems are used to handle & dispose materials.

4.2 Conclusion

Based on the findings collected from the questionnaires and interview the following conclusions are drawn.

- Policy is very important to guide an organization in the right directions. However, the company in this regard has given very low consideration to policy and as the result a huge gap is created in proper materials handling and disposal.
- Even though there is coaching and sharing of experiences among the workers the lack of proper consideration for formal training indicates that the organization has given less attention to developing its human resources.
- There is lack of interpersonal relationship between the material control section and other sections. In addition, it looks as if the stock control section performs its routine work by trial and error which has resulted over and under stocking. There is no constantly and regularly monitoring of materials for timely and efficiently meeting the requirements of the user. We can reach in to a conclusion that materials are purchased without considering and checking the basis of minimum and maximum balance seeing the recorded quantity level which has resulted overstocking. Thus materials are stored for a longer period even to extent of losing their usage values. There is lack of updating of stock list, which cause inefficiency in material issuance and incurs high inventory carrying cost and tied up capital. The researcher has learned that there is no review of

items in stock to highlight obsolete or surplus for appropriate actions and under stocking has sometimes interrupted some the operation of the company for a significant period of time.

- Efficient utilization of storage is very important for the consolidated supplies of materials, equipment etc with the minimum possible wastage of space. Inefficient use of space losses contribute to losses that occur due to obsolescence and deterioration materials. There is no enough and suitable storage space for new and incoming active materials. The storekeepers are spending part of their working hours by counting and handling these scrap, obsolete and retired materials. Even these unused materials are not stored in the most efficient manner incurring significant amount of carrying cost. In addition to all these, things become worse because the company presently has no proper rule and regulation and a clear surplus management policy.
- Use of technology is very important for the result of achieving organizational goal. However the company has given a little attention for use of mechanical system as a result there is lack of coordination between the sections which has contributed to the overstocking and wastage of capital.
- The material management department is weak in identifying the cost conclusion as it was found to be the factor affecting their decision on material handling.

4.3 Recommendations

Based on the knowledge obtained from the various findings of the research study the following recommendation are forwarded to help overcome the problems encountered in the organization in connection with material handling and disposal.

- A comprehensive policy and principles could give proper direction to avoid and prevent the unnecessary accumulation of materials and to undertake efficient and cost effective material handling and disposal system. Thus, the company must change or should revise the procedures and install good management system throughout the company hierarchical structure, with the view to avoiding problems regarding the possibility of policy implementation and innovation.

- Policies and procedures in relation to the sections should be defined, established, and communicated with the entire coordination of the associated personnel.
- Conduct short and long term training to employees according to their job positions and help the employee to adapt themselves to the changing environment to become efficient and effective on their daily activities. Hence, the company must organize on job training for employees working in the sections in the materials handling and disposal.
- Modern technological innovations that smooth out the tasks of the material handling department should bridge the gap of communication and coordination.
- The link between sections must be strong and current to provide effective and timely services needed for the good performance of the company. The warehouse activities should enhance and provide efficient service for the day to day operational activities of the company. Accountability should draw on users for not using materials handled per their request.
- For every problem area indicated by the researcher, cost reduction and basic material handling principles can foster new ways of handling the materials and improve the efficiency of the company.

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APPENDIX

St. Mary University College

Business Faculty

Department of Management

This questionnaire is designed to gather information about material handling and disposal system in the case of Issayas and Herouy Construction P.L.C. so that it will be used in a research to be made as partial fulfillment for a Bachelor of Art Degree in Management. Therefore the researcher kindly requests your full corporation to complete this questionnaire and return it as soon as possible. Your honest information will have contribution to the success of the study. Your answer will be maintained completely confidential.

N.B.

- You are kindly requested to answer all question
- You can give more than one answer if necessary
- No need of writing your name
- Put 'X' mark in the box that corresponds to your choice

Thank you for spending your valuable time by participating in this survey.

Part I General Information

1. Age: ☐ Below 25 Years ☐ 25-35 Years ☐ 36-45 Years ☐ Above 45 Years

2. Sex: ☐ Female ☐ Male

3. Your academic qualification:

   ☐ 12 Completed ☐ 10+1 ☐ Diploma ☐ MSc.

   ☐ 10 Completed ☐ 10+2 ☐ BSc./BA ☐ PHD ☐ Others

4. Year of service in the Company: ☐ Below 1 Year ☐ 1-3 Years
   ☐ 4-5 Years ☐ Above 5 Years
5. Occupation: ☐ Store Keeper ☐ Purchaser ☐ Stock Accountant ☐ Driver
   ☐ Site Manager ☐ Higher Management Body ☐ Daily Laborer
   ☐ Other technical and skilled person

Detail Information

1. Does the company handle materials in a planned and orderly manner?
   ☐ Yes ☐ No ☐ I don't know
2. Are there work procedures for employees assigned on material handling and disposal in your organization?
   ☐ Yes ☐ No ☐ I don't know
3. How do you see working environment for those employees working in materials handling department of your company?
   ☐ Very good ☐ Fair ☐ Not good at all
   ☐ Good ☐ Poor
4. Are the employees working in material management area trained in materials handling and Disposal System?
   ☐ Yes ☐ No ☐ I don't know
5. Do the employees have knowledge on the use of safe lifting techniques?
   ☐ Yes ☐ No ☐ I don't know
6. What types of material handling and disposal management system that your company applied?

   Mechanical Device ☐
   Manual Means with handling aid ☐
   Others _____
   _____

7. Does the organization provide safety wear devices (Protective Close and equipment)?
   ☐ Yes ☐ No ☐ I don't know
8. How the organization place materials to be disposed? (You can choose more than one option if necessary).

   - Different places ☐
   - By container ☐

- With in the same store ☐
- Other _____
  _____.

9. Does the organization conduct environmental impact assessment prior to material disposal?

   ☐ Yes ☐ No ☐ I don't know

10. Is there excessive material lock up a lot of capital?

    ☐ Yes ☐ No ☐ I don't know

11. If your answer to question No. 10 is yes, why do you think so?
    _____
    _____

12. Is there proper coordination among work unit who are responsible for material management and other section of the company?

    ☐ Yes ☐ No ☐ I don't know

13. Does the company check that purchased materials are per specification?

    ☐ Yes ☐ No ☐ I don't know

14. What procedures is employed to dispose stock left over's? (You can choose more than one option if necessary).

    - Use with the organization ☐
    - Return to suppliers ☐
    - Selling to other firms ☐
    - Selling to brokers ☐
    - Selling to employees ☐
    - If others Specify _____
      _____.

15. Does the company utilize computerized stock recording system?

    ☐ Yes ☐ No ☐ I don't know

16. Does the organization have fixed inspection and verification period?

    ☐ Yes ☐ No ☐ I don't know

17. If your answer for question no. 16 is yes, when is that?

_____
_____
_____.

18. Does the company have standardized store?

☐ Yes ☐ No

19. Which of the following stock transfer are relevant for the use of material economically?

- Stock transfer from main storage location to project store. ☐
- Stock transfer from consignment stores of vender to direct to the project. ☐
- Stock transfer from the one project store to another project store. ☐
- All ☐

20. Does the company hold scrap and obsolete materials?

☐ Yes ☐ No ☐ I don't know

21. Does the company take physical count?

☐ Yes ☐ No ☐ I don't know

22. If your answer for question no. 21 is yes? When?

☐ Every three month

☐ Every six month

☐ Annually

23. Do you use the physical count to:

☐ Reconcile with records

☐ To replenish under stock

☐ To remove damaged and obsolete stocks

24. If you have any suggestion, Comment and recommendations for the improvement of material handling and disposal in your organization please state.

_____
_____
_____
_____.

Interview

The following questions were forwarded for the store management section head and the project manager in order to enrich the study and answer the research questions. Consequently the responses were organized and discussed for each questions presented.

1. Is there materials inventory policy in the company? If No State the reason.
2. Discuss what kind of system that the company uses for materials handling and disposal?
3. Discuss the actual practice of materials handling and disposal in the company?
4. Have you established minimum maximum stock limit?
5. How and when the obsolete materials become overstocked?
6. How are the possible problems alleviated in coordination materials handling in stores that consume a lot of capital?
7. Appropriate training for workers that participate in material handling and disposal?
8. How do you arrange the methods of order?
9. Due have perishable stocks like chemicals with limited shelf life?
10. What measure do you take not to contain material that affects the environment?
11. What possible strategies are designed for effective and efficient materials handling procedures for the futures?

CANDIDATE'S DECLARATION

I, the undersigned declare that this senior essay/project is my original work, prepared under the guidance of Ato Biruk G/Michel. All sources of material used in the manuscript have been duly acknowledged.

Name: Senait Teklu

Signature: _____

Place of submission, St. Marry University Department of Management.

Date of Submission: **7/06/2011**

SUBMISSION APPROVAL SHEET

The senior research paper has been submitted to the department of management in partial fulfillment of the requirement of BA Degree in management with my approval as an advisor.

Name: _____

Signature: _____

Date: _____