

**AN INVESTIGATION INTO INVENTORY MANAGEMENT SYSTEM'S  
EFFICIENCY FOR PRODUCTION IMPROVEMENT AT NAVACHAB GOLD  
MINE**

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## **Abstract**

The study focused on the inventory management systems' efficiency for production improvement at Navachab Gold Mine. The study was guided by the following objectives; to investigate factors that contribute to high non-moving inventory, factors contributing to understock and overstocking and factors contributing to high expiry and obsolete inventory at Navachab Gold Mine. The research used a sequential explanatory mixed methods approach using quantitative and qualitative research methodology. By use of simple random sampling, 97 respondents from Ore Processing, Engineering, Human Resources Management and Procurement departments were selected. The study used both closed and open ended questionnaires to collect data. The findings of the study revealed that Navachab Gold Mine orders its stock depending on the demand from end users and their forecasting of inventory levels. The findings also showed that Navachab Gold Mine makes use of the speculative purchasing policy when making orders from suppliers. Navachab Gold Mine has a strong data center for its stock such as receipts, invoices which help in keeping record of all the relevant prices so as to carry out a stock valuation. Navachab Gold Mine also does quarterly stocktaking and inventory tracking. Basing on the findings, the inventory management system at Navachab Gold Mine is effective, however a few factors including end users' demand and forecasting on inventory levels, management styles, procurement staff competency, hinder inventory management activities and hence production at Navachab Gold Mine. It can therefore be concluded that inventory management systems' efficiencies are interrelated to production performance of an organization. From the findings, it was evident that proper inventory management systems could lead to efficiency and effectiveness in both production and organizational service delivery by avoiding over stocking and under stocking, having the right stock at the right time and in the right quantity, Navachab Gold Mine can improve its inventory management by following the recommendations given.

## **DEDICATION**

The fruits from this research are dedicated to my late father, my friends, my fiancé and my mentor for their moral and financial support throughout my academic career. May God reward you abundantly.

I sincerely thank my supervisor, Dr. Mpho Galike for her patience, guidance and the precious time she spent supervising me until the completion of this thesis is acknowledged with profound gratitude.

I sincerely thank my mentor, Innocent Molekwa and my friends for their moral and financial support in enabling me to complete this research, may God reward you abundantly. In a special way, I thank my Fiance Fetsu Benjamin for being there for me all the time I needed support and care.

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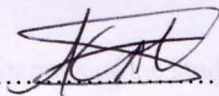
I sincerely thank my mentor; Innocent Matsika and my friends for their moral and financial support in enabling me to complete this research, may God reward you abundantly. In a special way, I thank my Fiancé Petrus Benjameni for being there for me all the time I needed support and care.

**DECLARATION**

I TALEINGENAWA ESTER KALIPI declare that “An investigation into inventory management system’s efficiency for production improvement at Navachab Gold Mine” is my own work and that all the sources that I have cited have been shown and acknowledged by the means of complete references.

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## **CHAPTER 1: INTRODUCTION**

### **1.1 Background of the study**

Navachab Gold Mine is one of the two gold mines in Namibia located in the central-west corner of Namibia, in Southern Africa and started its first operations since 1989. It is the oldest mines in Namibia and the first gold mine in the country. The mine consists of different departments which serve different functions within the organization to ensure that the objectives and goals of the company are meet. The different departments comprise of the Mining department, Processing plant, Engineering, Human resources, Procurement and Heavy Moving Equipment departments. Just like any other mine in Namibia, all dispensation of Navachab supplies such as, working uniforms, stationaries, spare parts, and services on machinery is done in-house.

The procurement department is then mandated with ensuring that the company's warehouse has all the required supplies for the whole mine at all times, without incurring overstock or experiencing understock. However, Navachab Gold Mine procurement reports high non-moving stock as some stock items may take longer than estimated before dispersing or dispersing may not happen until the items reach their expiry dates (Johan, 2015). Aron-Gordon (2016) states that non-moving inventory is not good for a business as it takes up valuable capital and resources that could have been reinvested into the business to generate more profit.

Inventory management is primarily about being able to specify the right size of stocked goods and proper placement of stocked goods. Inventory management is a key requirement in every department or section within an organization to ensure successful

planning and a smooth and uninterrupted course of production ensuring that the unnecessary and unplanned disturbances of running out of stock are avoided (Ayad, 2011). The Inventory management scope also includes all the lines between “stock lead time, inventory holding costs , asset management, forecasting of inventory, valuation of inventory, visibility of inventory, available physical storage for inventory, quality management of inventory, replenishment, returned inventory, defective inventory and consumers demand forecasting” (Ngugi, 2014). The main aim of inventory management is ensuring there is sufficient inventories at the lowest possible cost, when given the objectives of the business ensuring that there is no interruption on stock or supplies that may affect the ongoing operations. When making inventory decision, the management has to strike a balance between the different cost components associated with inventory, these costs may include but not limited to costs of supplying inventory, inventory-holding costs and costs resulting from insufficient inventories (Pandya, 2016).

According to Nyabwanga and Ojera (2012), inventory control is the activity which involves the organizations ability to ensure there is sustainable available items to the customers. Inventory control correlates with the manufacturing, purchasing and distribution functions of goods to meet the needs of the customers. This role includes but not limited to the supply of ongoing sales items, new and recent products, all consumables, all spare parts, and all other supplies depending on the specific type of business (Ranganathan, 2014).

Proper inventory controls make it easy for a business to support its customer services delivery and logistic activities most specifically in situations where purchasing or manufacturing of goods is pro-longed. The need for effective operations management is

on the increase, this pushes for organizations to have well defined inventory management systems in place which are well managed and controlled. In practice firms spend an excessive amount of resources that includes time and money trying to manage and direct their suppliers to ensure that critical inventory/stock levels are maintained and that the critical flow of goods for operations continue (Kariuki, 2013).

## **1.2 Statement of the problem**

Navachab has experience of inconsistencies in inventory levels leading to various back falls including losses that come as a result of overstocking, under-stocking, expiry inventory, non-moving and dead stock (Botshiwe, 2019). As of 2019, Navachab recorded 53% non-moving, 27% of slow moving and 20% fast moving inventory (Xavier, 2019). Sheakh (2018) argues that an effective inventory management system should give a company less than 30% non-moving inventory, and at least 50% or more of fast moving inventory. Cachon (2014) states that an effective inventory does not only save the company on costs associated with storage, but it also saves the company other costs such as obsolete inventory costs. The 2019 yearly production report further states that lack of equipment and reagent availability caused a huge production loss in 2019 (Matsika, 2019). This study aims at investigating the inventory management system's efficiency for production improvement at Navachab Gold, with a view to propose possible strategies that can improve inventory management at Navachab.

## **1.3 Research Objectives**

### **1.3.1 Objective of the Study**

The main objective of the study is to investigate the efficiency of the current inventory management systems used at Navachab Gold Mine for production improvement.

### Specific Objectives:

1. To investigate factors that contribute to high non-moving inventory at Navachab Gold Mine
2. To investigate factors that contributing to Understock and Overstocking at Navachab Gold Mine
3. To investigate factors that contributing to high expiry and obsolete inventory at Navachab Gold Mine
4. To recommend possible strategies to enhance and improve the current inventory management techniques for production improvement at Navachab Gold Mine.

#### **1.4 Significance of the study**

The study investigated the inventory management systems used at Navachab Gold Mine with major focus on their efficiencies towards production improvement at the mine. The findings will greatly contribute towards the improvement of the overall inventory management at the mine, improved forecasting of stock, improved stock taking and stock level controls which will result in massive cost saving for Navachab in return.

The study will also recommend strategies for better inventory management systems for Navachab, and other Mines that may find themselves in similar situations. Moreover, the study will further add to the body of literature on factors contributing to high non-moving stock, overstock, understock as well as obsolete and expiry inventory. The study will also reveal effective inventory management systems and techniques in the Namibian mining industry context and also act as a basis for other researchers in this field.

### **1.5 Limitations of the study**

As part of human nature and fear of trust and uncertainty from the respondents when answering the questionnaires (Anichebe & Agu, 2013), some respondents may skip specific question which will result in the specific respondent's entire questionnaires to be null and void which will then result in a reduced sample size. For security purposes some information that may be important to this study may be kept confidential by the procurement department.

In addition, since the researcher is a Navachab employee, some respondents might view the interview and questionnaires as an audit of their work or performance evaluation on their work and may end up holding on to critical information, which could result in inaccurate results or findings. To all these limitations, the participants were assured that the information will be kept confidential and that it will not be used for any other purpose except for meeting the objectives of this research and for the company's improvement.

### **1.6 Delimitations of the study**

The study scope was limited to the internal inventory management systems and supply chain network at Navachab Gold Mine only and not extended to any other mine or any inventory management outside of Navachab Gold Mine.

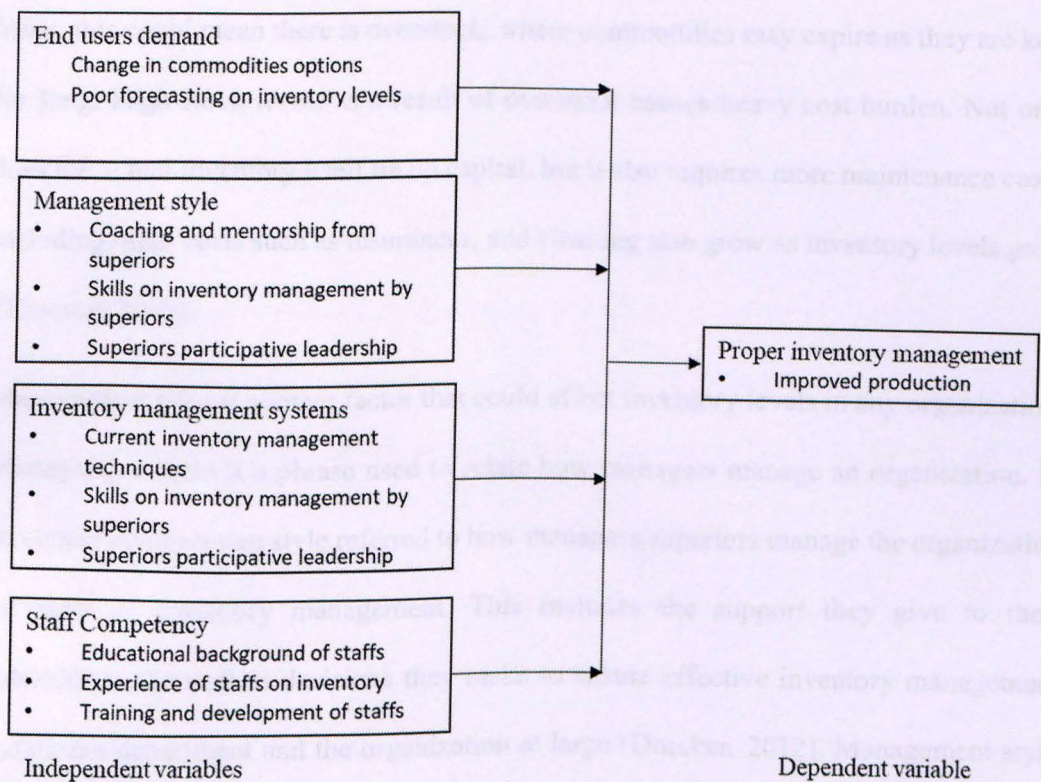
## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Conceptual Framework**

A conceptual framework is a diagram representation of the relationship between independent variables and dependent variables. The study sought to investigate the inventory management techniques efficiencies for production improvement at Navachab

gold mine. The main objective of the study is to investigate the inventory management system's efficiency at Navachab Gold Mine, for production improvement. The specific objectives were to investigate factors contributing to high non-moving inventory, high understock and overstock as well as high expiry and obsolete inventory at Navachab gold mine as well as to analyze the current management style practiced at Navachab Gold Mine. To analyze the current staff competency and engagement at Navachab Gold Mine and lastly to recommend possible strategies to enhance management style, staff competency and engagement as well as improved inventory management techniques for production improvement at Navachab Gold Mine.

The dependent and independent variable were established from this factors. The independent variables for the multiple regression analysis are end users demand, management style, inventory management systems and staff competency. On the other hand, the dependent variable was improved production due to inventory management.



The procurement department aims to meet the demands of the end users of the commodities. However, end users demand is sometimes not consistent. This is usually due to the change in quality of commodities from suppliers that the end users no longer find the quality fit for their consumption. This creates a load of obsolete stock as the old stock remains unfinished while the end users demand for the new commodity (Cachon, 2014). Forecasting of inventory levels by end users to the procurement department is very important as it guides how much stock the procurement department should purchase and how much it should keep in stock.

Poor forecasting of inventory levels results in either too little stock or too much stock purchased by the procurement department. This understock may result in insufficient availabilities of commodities and hence affecting production. In the case of Navachab

Mine, this could mean there is overstock, where commodities may expire as they are kept for long. High stock levels as a result of overstock causes heavy cost burden. Not only does the actual inventory itself tie up capital, but it also requires more maintenance costs, including other costs such as insurances, and cleaning also grow as inventory levels grow (Toomey, 2012).

Management style is another factor that could affect inventory levels in any organization. Management style is a phrase used to relate how managers manage an organization. In this study management style referred to how managers/superiors manage the organization in terms of inventory management. This includes the support they give to their subordinates as well as decisions they make to ensure effective inventory management within the department and the organization at large (Drucker, 2012). Management style may also be related to the behavior associated with personality (Barnet, 2016). According to Tripathi and Agrawal (2014), management style is “the adhesive that binds diverse operations and functions together”.

Effective management style is the extent to which a leader continually and progressively leads and directs the subordinates to a predetermined goal and objective agreed upon by the whole team (Ayad, 2011). Fiedler (2012), considers management style as the unique way in which an organization makes decisions and formulate goals, implement strategies, corporate image building, dealing with key stakeholders and other basic management activities. This means that management style at Navachab Mine should provide supportive to employees, and ensure effective inventory management procedures and systems exit in the organization.

An effective Inventory Control System should minimize time and holding costs, it should also maintain sufficient stock (not more not less) for smooth production. In addition, an effective inventory management system should minimize sales operation and provide good customer service (Anichebe & Agu, 2013). A proper inventory management system should also control investment in inventories and ensure an operation on optimum level (Sofat, 2015). Different business may apply different inventory practices to meet their specific requirements and circumstances to help in reducing the costs associated with inventory.

According to Wambua (2017), team leader competency refers to the interaction and behavior of the leader or supervisor of the team. This includes the behavioral approach that shows the ability to managing tasks and responsibilities by influencing others in a good way. This competency also involves the ability to take risks and to observe the external and the internal environment (Wambua, 2017). In theory, competence is defined in terms of job knowledge, skills and attitudes. Tripathi and Agrawal (2014) defines competency as a group of related job knowledge, attitudes, and skills. It is necessary to emphasize the essential values of competency because of its greatest contribution to the achievements of company's goals.

Inventories represent the second largest asset category for manufacturing companies, next only to plant and equipment (Richard, 2014). The proportion of inventories to total asset generally varies between 15 to 30 percent. Given substantial investment in inventories, the importance of inventory management cannot and will not be overemphasized (Kariuki, 2013). An effective inventory management should ensure a continuous supply of raw materials to ensure a continuous smooth production, it should also be able to maintain

adequate finished goods inventory for uninterrupted sales operation and efficient customer services (Pandya, 2016).

In addition, it should be able to minimize on the holding cost and time and control investment in inventories and keep it at an optimum level (Cachon, 2014). Finally, a good inventory management permits a better utilization of available stocks by facilitating interdepartmental transfers with in a company and maintains sufficient stocks of raw materials in periods of short supply and anticipated price changes (Wambua, 2017).

Navachab gold mine holds stock in order to maximize economies of scale, balance supply and demand, specialization and presentation from uncertainties (Xavier, 2019). Inventory is a significant asset in organizations. Its effective management is a key task with in the auspices of operations and viewers of organization (Aron-Gordon, 2016). Inventory control in Navachab gold mine co-ordinates the purchasing, manufacturing and distribution functions to meet the marketing needs and ensures that organizations efficiency is in line with the set objectives and centres on customer satisfaction (Xavier, 2019).

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 (Frazelle, 2015). 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 customer needs, all this are important for organizational performance (Drucker, 2012). Inventory management helps organizations to meet higher than expected demand which is one of the challenges that

most organisations fail to control. This helps the organization to protect against running out of inventory (Aron-Gordon, 2016).

The study carried out by Xavier (2019) reveals that Navachab gold mine holds stock that is used to satisfy current and future needs of the company. Navachab gold mine carries out quarterly stock taking of items in stores and stock is inspected for quality and right specifications (Botshiwe, 2019). Basing on the findings, Inventory management helps organizations to cut down production costs incurred by an organization and helps ensure that there is efficient production at the organisation (Chand, 2015).

## **2.2 Theoretical Review**

The theoretical framework is a review of the existing or self-formulated theories in relations to the research objectives (Creswell, 2014). This section reviewed theoretical foundations relevant to inventory management. These theories include inventory control theories, purchasing objectives and policies, inventory management systems, relationship marketing theory, theory of inventory and production and Strategic Choice Theory (SCT). The section further went on to review challenges faced by organizations in relations to inventory management.

### **2.2.1 Inventory control theories**

According to Bierdernman (2014), inventory refers to the stock of any item, product or commodities or resource used in an organization. Bierdernman (2014) also add that an inventory system is the set of policies and controls put in place to monitor levels of

inventory and determine the right quantity of stock to be maintained, the level of stock is to be replenished and how much of reorder stock to be done.

Inventory control is the process of ensuring that the right amounts of stock are maintained by an organization in order to ensure their customers' needs and demands are met without experiencing any delays at the same time keeping the costs associated with holding stock at a minimum (Ballou, 2014). Inventory control is essential for any business to stay competitive. Through inventory control, the business will be able to maintain optimal inventory levels, keep holding and operational costs low, make maximum profits, and succeed in satisfying customers by delivering orders on time (Sofat, 2015). In order to sustain and strengthen great growth in a business, more disciplined and structured approaches to inventory control should be taken. This will assist in coordinating the purchasing, manufacturing and distribution functions to meet the marketing needs of the business (Ngugi, 2014).

Managing warehouse inventory system is one of the critical activity in inventory controls in every business as it gives the business the ability to optimize on stocks in the most profitable way by taking into account all the factors that may affect demand and supply for commodities (Richard, 2014). A business with good inventory control keeps up with fulfillments on orders and by objectively forecasting demands it can maintain low operational costs and achieve good production efficiencies (Stevenson, 2010).

According to Stevenson (2010), when the right quantity of stock is maintained and the right reorder level of commodities is established, the business can save on cost associated with overstock, understock, obsolete and expired inventories. Kariuki (2013) writes that effective Inventory Control, prepares the company for unexpected supply shortage or

seasonal spikes in demand which leads to customers' satisfaction and consistence in operation's efficiencies.

In most businesses proper control of inventory plays a big role in allowing operations such as production, purchases, sales, marketing and financial management to be carried out smoothly (Zuva & Choga, 2016). Inventory is essential for production activities, maintenance of plant and machinery as well as other operational requirements and any increase in the redundancy of machinery or operations due to shortages of inventory may lead to production loss and its associated costs (Botshiwe, 2018). Cachon (2014) contends that the basic challenge is to determining the inventory level that is most effective within the specific organization. Botter and Fortuin (2015) argues that inventory levels get contorted due to wrong or inaccurate purchasing decisions. The bad purchasing decisions may be driven by quantity breaks and discounts and adds that changes in commodities types are made too often even without any strategy or system put in place to run out the existing inventory. This distortion in inventory levels is what results in overstocked, understocked, non-moving, obsolete or expired inventory (Lysons, 2010).

### **2.2.2 Purchasing Objectives and Policies**

Stevenson (2010) emphasizes the primary objective of purchasing is to obtain the correct equipment, materials, supplies and services in the right quantity of the right quality from the right source at the right time and cost. Purchasing departments in different companies have different ways of determining and choosing their preferred suppliers of the different good and services they may require (Aron-Gordon, 2016). The decisions on choosing a supplier depends on many factors including competitive pricing, lead time on goods and

services, reliability of the supplier quality as well as the relationship build between the supplier and the business (Lysons, 2010). According to Barnet (2016), purchasing policies within organization can be done in two different ways either by centralized or decentralized purchasing policy.

**Centralized:** This purchasing policy allows for an organization to use one department as its purchasing department for all the goods and services the organization may require. The system enables the employment of specialized buying staff that can pin-point the best available products, prices and delivery dates under the centralized procedure put in place by the organization (Sheakh, 2018). Common administrative procedures and documentation to all buying activities is applied in centralized system (Stevenson, 2010). This method easily allows for bulk purchasing which may result in discounts on most of the commodities.

Navachab gold mine makes use of the centralized method of purchasing. According to Xavier (2019), for non-stock items all departments raise purchase request as an indication for intending to purchase something to the procurement department with different quotations attached. The Procurement department then raises a Purchase order and the required goods are bought through this. On other commodities that are stock items in the warehouse depending on the customers/departments forecasting demand, the procurement department orders and reorders when required (Xavier, 2019).

**Decentralized:** This purchasing policy allows for an organization to have each department purchasing for all the goods and services it may require. In this system each department is responsible for obtaining its own supplies without reference to a central control (Richard, 2014). This method does not allow bulk purchases hence higher prices may be

paid through ignorance of alternative sources unlike the centralized method, the method is however very quick and convenient (Joseph, 2014). Navachab gold mine does not make use of the decentralized purchasing because the mine prefers using only one department (procurement) to handle all the purchasing needs of the company. In addition, Cachon (2014) emphasizes on the 3 types of purchasing policies by which supplies can be obtained.

**Purchasing by Quotation:** this method allows for all possible and potential suppliers to be registered by the company as a vendor and the procurement department will then select the best supplier for each order (Ballou, 2014). Although the method attracts competitive prices, the technique hinders the formation of good term relationships with the individual suppliers who in the process may be willing to offer special discounts or even modify a product's design to meet the customer's needs (Ayad, 2011) . Navachab gold makes use of purchasing by quotation on non-stock items where quotations are made with different vendors and a suitable one for the specific order for that specific period is selected for purchasing (Xavier, 2019).

**Purchase by Contract:** this method allows for all purchases to be done on a contract basis, where case contracts are issued to the identified suppliers to supply all requirements for specific goods over an agreed period of time (Hugo, 2012). The method is suitable as deliveries are steady and reliable however the purchasing firm needs to purchase in bulk since contracts bear fixed prices so the firm cannot run around for cheaper sources while existing contracts are in force (Kariuki, 2013). This method is therefore most suitable where price fluctuation is not or less expected. The method may lead to overstock and

expiry inventory. Navachab Gold Mine makes use of this method on all the stock items in the warehouse (Xavier, 2019).

**Speculative Purchasing:** This method is done when price of externally purchased goods fluctuant significantly on large scale purchases this means when suppliers prices are exceptionally low then the company purchases more goods from the supplier and save on this costs however when supplier's prices rise then the company purchases are affected and the company cannot buy in bulk waiting for another drop in price (Lopez, 2013). This method may result in understock and or overstock which will have a negative impact of organization's performance and production losses (Cachon, 2014). Navachab gold mine does not make use of this method of purchasing.

### **2.2.3 Inventory management systems**

Inventory management is defined and systems that ensure that the required inventory levels that can sustain the organization's daily operations at minimum costs are maintained (Wambua, 2017). This covers systems and controls that are put in place to ensure that issues like determining the level of stock to order, when to order, establishing receipt and inspection procedures and providing proper storage facilities are well defined (Scott, 2015). Without proper inventory management techniques or procedures in place, firms are likely to face undesirable inventory levels. The undesirable inventory levels may result in high non-moving stock, understock, overstock, obsolete or expiry stock (Lysons, 2010). Several techniques have been advanced to tackle constraints associated with inventory. These techniques must be in line with the firm's objectives. These techniques include:

#### **Economic Order Quantity (EOQ) Model**

The economic order quantity also known as the Wilson EQQ model is a model that defines the optimal quantity of stock to be ordered that gives minimal total variable costs required to order and that gives minimal hold inventory cost (Anichebe & Agu, 2013). In agreement Barnet (2016) also defines to EQQ as the optimal ordering quantity for an item of stock that aids in the minimization of costs. This inventory management technique assumes that the demand for the item is known with certainty, the lead time is known and fixed, the receipt of the order occurs in single instant, quantity discounts are not calculated as part of the model and shortages of inventory or stock out do not occur (Ballou, 2014). With this technique, the Economic order quantity graphs can be drawn which illustrate the relationship amongst the ordering costs, holding total costs and economic order quantity (Hugo, 2012).

The Economic Order Quantity in short measures how much stock one needs. The calculation is based on costs of sourcing and storing the inventory. The other number that's used in inventory management calculations is the reorder point. This is the specific inventory level at which more stock should be ordered for an item. Economic Order Quantity or EOQ calculate the quantity of items to be ordered, while Reorder Point calculates at what inventory level of the items a re-order needs to be performed (Chand, 2015). The two calculations are critical because if not well calculated the business will end up with overstock or understock. Understock will affect your production efficiencies and customer's dissatisfaction. On the other hand, Overstock comes with increased storage and holding costs, damages or even product expiry (Toomey, 2012).

Factors to consider for calculating the Right EQQ:

Ordering Cost: this are all the costs involved in ordering new stock (C)

Holding Cost: this involves the storage cost per unit per year (H)

Demand: this is how much is expected to sell (D)

Economic Order Quantity is therefore =  $EOQ = \sqrt{2 \times DC} / H$

### **Just in Time (J.I.T)**

This is an inventory management technique that is aimed at maintaining just enough material in just the right place at just the right time to make just the right amount of the product (Sofat, 2015). This was pioneered by the Japanese manufacturing firms where inventory was acquired only when required in the business for production process and this aimed at improving the return on investment of the business by reducing in-process inventory and its associated costs (Ballou, 2014). In this system, the supplier is responsible to deliver the components and part to the production line “Just in Time” to be assembled. Other names for just in time system is Zero stock inventory and production (Sofat, 2015).

For a successfully Just in Time method, the parts should be of high quality and must have very minimal or no defects as this may hinder the operations of the assembly line, this also means the supplier must be reliable at all times and the relationship with the supplier should be smooth to avoid unnecessary delays and have a continuous operation. This also implies that the supplier should be located near to the company with a reliable transportation available (Hugo, 2012).

Just in time inventory management system allows business to save on holding and storage costs as well as mishandling/damage costs of raw materials. According to Ballou (2014), Just in time purchasing recognizes high costs associated with holding high inventory level and because of this reason it has become popular in most organizations to order inventory

just in time of production to avoid costs of holding inventory like storage lighting, heating, security, insurance and staffing (Aron-Gordon, 2016).

### **Material Requirement Planning 1 of Inventory Management**

This is an inventory management technique that works backwards from the scheduled quantities. The method requires for dates for finished products to be specified in the master production schedule in order to be able to determine the requirements for components needed to meet the master production budget schedule (Sofat, 2015). This inventory management technique determines the components that are needed, the quantities of these components needed, the time these components will be needed and date that this components must be ordered so that they are likely to be available when needed (Joseph, 2014).

### **The Action Level Methods of Inventory Management**

The basic method of managing stock by quantity is by means of fixing for each commodity stock levels which are recorded in the stock control system and subsequently used as a means of indicating when some action is necessary. We have a minimum, ordering, hastening and maximum stock levels (Toomey, 2012).

The minimum stock level is the amount expressed in units below which the stock of any given commodity should not fall. Re-order Level is the amount expressed in units of issue at which ordering action should begin and the delivery will be done before the stock level gets to maximum. The hastening stock level is the amount expressed in units of issue at which an estimate is made for the hastening action to be taken by requesting the suppliers to make early delivery. The Maximum stock level is the amount expressed in units of issue

above which the stock level should not exceed. This inventory management technique prevents the results of overstock, understock, non-moving, obsolete and expiry inventory when properly carried out (Barnet, 2016). According to Xavier (2019) Navachab gold mine makes use of the action level methods of inventory management to determine what to order and when to order.

Ngugi (2014) articulates that inventory classification systems help allocate time and money in inventory management and allow businesses to deal with multiple product lines with a multitude of stock keeping units. Navachab currently uses the computer-based warehouse management system (Botshiwe, 2019). Toomey (2012) says inadequate skill is a major factor affecting efficiency of inventory management. Sheakh (2018) adds that the use of manual inventory tracking and stocktaking is very much error-prone which then affects the efficiency of Inventory management. To be most effective, the inventory control system must also provide information in a timely manner to allow for critical decisions to be taken while problems can still be corrected (Cachon, 2014).

In order to achieve the objectives of minimizing stock related costs, organizations should maintain sufficient levels of stock to enable smooth business operations. A number of practices have therefore been advanced to handle these costs. Lysons (2010) highlights the following practices that minimize stock related costs;

**Inventory Planning and Scheduling:** This is how units of stock are required by an organization in a given period to enable smooth and consistent business operations. A good stock plan should be set in advance this enable planners to set the correct procurement/purchase dates and quantities that are in line with the plan which avoids disruptions due understock (Joseph, 2014). The use of inventory planning and scheduling

is practiced at Navachab gold mine where stock is ordered in bulk and is kept in the mine warehouse to be used for an estimated time until another stock is received (Botshiwe, 2019).

**Inventory Recording:** Accurate and up-to-date stores records are keys to effective stores management. The basic procedures include counting and recording immediately after receipt or production. It also includes counting and recording whenever there is a store transaction. When issuing anything from the warehouse, requests should be properly authorized and the correct details and information should be recorded this includes code number, quantity of the transaction and the voucher reference (Lysons, 2010).

Inventory recording is practiced by organizations to reduce the errors of stock management and to earn accurate and reliable stock records (Ranganathan, 2014). This includes the physical counting and measuring of quantity of each item in stock and recording the results which involves spot checks, surprise checks and stock taking (Drucker, 2012). Navachab Gold Mine has a strong data center for its stock such as receipts, invoices which help in keeping record of all the relevant prices so as to carry out a stock valuation. Navachab Gold Mine also does quarterly stocktaking and inventory tracking (Xavier, 2019).

**Inventory Valuation:** Is another stock control technique, which refers to the establishment of the value of stock and therefore its implication on the profits. Lysons (2010) identified the following methods of stock valuation; First in First out (FIFO), Last in First out LIFO) and the average price method. The FIFO method of inventory evaluation is used at Navachab Gold Mine. According to Pandey (2015) with the FIFO method materials received first are issued first. After the first lot or batch of materials

purchased is exhausted, then only the next lot is taken out for supply or use. The inventory is priced at the earliest costs (Anichebe & Agu, 2013).

**Physical Inventory Counts:** This method allows the physical counting of all the materials and item in the warehouse. This method is very much prone to human errors and it is not always recommended although it is still commonly used by most organizations (Ayad, 2011). It is very crucial to ensure that any changes made to correct mistakes is well and adequately documented by management (Ballou, 2014). Physical counts of inventory are practiced by Navachab gold mine during delivery and packing of items (Xavier, 2019).

**ABC Analysis:** It's considered as one of the best approaches and based on the principle of selective control where the maxim is "put your effort where the results are maximized (Bierderman, 2014). Hugo (2012) notes that the ABC analysis categorizes products based on their order of importance. The order of importance may vary from cash flows, lead time, stock outs, sales volume, or profitability. The tanking factors are first determined and then only after the break points are identified for classes A, B, C and soon (Aron-Gordon, 2016).

A good example of the ABC method is the 80-20 concept which is mostly useful in distribution planning when the products are grouped or classified by their sales activity. "The top 20 percent might be called A items, the next 30 percent B items, and the remainder C items. Each category of items could be distributed differently. For example, an items might receive wide geographic distribution through many warehouses with high levels of stock availability, whereas C items might be distributed from a single, central stocking point (e.g. a plant) with lower total stocking level than for the A items. B items

would have an intermediate distribution strategy where few regional warehouses are used” (Ballou, 2014).

### **2.2.5 Relationship Marketing Theory**

Relationship marketing theory is considered to be relevant in understanding the effect of inventory management regarding obsolete stock and hence giving a theoretical background for this study. According to Ketchen & Hult (2013), this theory can be used in the various fields such as supply chain management, international marketing, relationships, networks, databases, information as well as in transactional analysis. “This theory offers various dimensions such as commitment and cooperation that are useful in studying the various relationships that exists between different phenomenon that are related to the relationship between the buyer and the seller especially in aspects of information sharing” (Ballou, 2014). The relationship marketing theory discusses the various relationships between buyers and suppliers. It includes the information sharing and communication relationship between buyer-supplier, the various dimensions in the relationship as well as the rationale of the relationship (Wambua, 2017).

### **2.2.6 Strategic Choice Theory (SCT)**

Strategic choice theory is considered to be relevant in understanding the effect of staff competency on inventory management, it is therefore used to provide the theoretical background for this study. According to Raviv and Kolka (2013), strategic choice theory shows the relationship between the higher management choices and organization performance as well as interaction of the internal and external organization. The theory stresses more on the importance of management decisions towards the organizational performance. Canchon (2014) argues that to establish a strategic choice model that depicts

the interdependence among the environment and organizations, strong actions and overall business performance is needed.

New technology in inventory management is one of the factors that can help business improving in the field of managing inventory well. High management should be able to make decisions regarding new technology in inventory management such as RFID, bar codes and ERP systems in their business with the help and support from their entire business most especially from the functional department (Wambua, 2017). This theory supports in understanding how staff competency is as a challenge affecting inventory management at Navachab gold mine.

### **2.2.7 Challenge of Inventory Management**

According to (Drucker, 2012) an incomplete, inaccurate and hard-to-find inventory has a huge negative impact on a business and by implementing a real-time inventory management system the inventory will be easily located and accurate data regarding the stock is recorded. Here are a few challenges that businesses experience because of poor inventory management systems (Chand, 2015).

**Inconsistent Tracking:** The using of manual inventory tracking procedures is not only time consuming but it is also very much error prone which results in a lot of inconsistencies in tracking (Barnet, 2016). It is advisable for businesses to use new methods of tracking to improve on errors that comes with manual tracking. Upgrading to tracking software that provides automated features for re-ordering and procurement may clear this challenge (Frazelle, 2015). The business may also consider carrying out frequent stock auditing processes, for example daily cycle counting. This may reduce human error and provide more accurate, up-to-date inventory data (Barnet, 2016).

**Warehouse Efficiency:** Inventory management controls at the warehouse is labor-intensive and it requires much to be done ranging from stock receiving, picking, packing and shipping. The challenge around here is to perform all these required tasks in the most efficient and effective way possible (Frazelle, 2015). Limited visibility on stock in the warehouse also adds to this challenge when your inventory is hard to identify or locate in the warehouse (Richard, 2014). On the other hand, warehouse spacing is also crucial in warehouse efficiency. Finding the right stock is important for effective and efficient warehouse operations and positive customer experiences (Joseph, 2014). Adding images with product descriptions to the inventory database also improve purchasing and receiving processes. It also enhances accuracy and prevent misplaced inventory (Pandya, 2016). "Give employees the right inventory tools for the job. They need software to replace manual inventory documentation, and paperless transactions for invoices and purchase orders" (Zuva & Choga, 2016).

**Changing Demand:** this challenge is mostly due to customers change or inconsistencies in demand. When too much stock is ordered during such situations, stock may end up as obsolete or expired stock on the other hand when too little stock is made, customers satisfaction is at risk (Bierderman, 2014). Ordering strategies and revising of new technology may help compensate for changing demand.

**Problem Stock:** When a business deals with perishable and fragile inventory, special storage plans should be well identified. on the other hand, high-value inventory needs specific loss-prevention strategies and inventory controls this may include insurance for the specific stock. The challenge come in when goods are spoiled or damaged and there is no plan for restoring the loss do the damage (Ali et al, 2013).

**Supply Chain Complexity:** The change and shift in supply chains places burdens on the inventory planning and management operations. It is therefore very crucial for the business to identify flexible and reliable suppliers who offer predictable lead times (Cachon, 2014).

**Insufficient Order Management (understock):** Most business have difficulties in dealing with situations they unexpectedly find themselves in such as situations of understock. It is very important for a business to have already exciting plans should unexpected/unpredicted situations happen. In most cases situations like this happens during pick times/seasons of the business. Using historical and seasonal data trends can help in accurately predicting customers demand (Chand, 2015).

**Increasing Competition:** “Globalized supply chains are subject to unpredictable economic shifts and market forces that impact the competition for raw materials” (Barnet, 2016). In most cases small businesses are challenged by having to choose between competing for high-demand materials or holding enough inventory to control costs (Akandipe, 2014).

**Overstocking:** most businesses are challenged by keeping too much stock at the time and failing to get rid of it. This situation does not only impact the business cash flow but it also creates extra cost on storage or spoiled goods and may invite theft within the organization (Ballou, 2014). Businesses should employ and practice proper and suitable inventory management systems.

**Poor Production Planning:** Most businesses struggle with this specific challenge because of poor production planning. Poor production planning would result in no enough

material to get the production going hence hindering the production (Zuva & Choga, 2016).

**Lack of Expertise:** this challenge is attributed by an incapable management team. It is very important to have a skilled and experienced management team that can improve inventory management strategy and can introduce new technology (Scott, 2015).

**Poor Communication:** Communication has and is always key for any business to prosper. The different departments should work as a team and should be able to share all the necessary information in order for the business to prosper and collaboration are key (Scott, 2015).

**Demand Forecasting:** this challenge is mostly brought about by the inaccurate forecasting in demand by the end users. This is most likely to happen in organizations where purchasing is centralized because the different departments may provide inaccurate, late, inconsistent and a lot of shift and changes in demand forecasting of items (Pandya, 2016). In addition to the challenges discussed by Kariuki (2013), (Anichebe & Agu, 2013) adds that are wholesalers and retailers that are major actors involved in downstream distribution channels face a special challenge in keeping the right inventory levels. This is due to due inconsistencies in demand and expectations of customers about product availability. The challenge grows even bigger when products are diversified in terms of their color/design, package type, size and so on. They also add that as companies strive to avoid lost sales from stock-out of inventory, there is a tendency to overstock (Anichebe & Agu, 2013) which creates yet another problem for the business.

### **Demand Management**

Demand management may be described of as strategies to estimate and manage customers' demand, with the aim of using the same specific information to shape operational decision (Anichebe & Agu, 2013). Independent demand is related to the demand that is based on external market requirements rather than related to other items' demand. The market demand for consumer goods is a good example of independent demand. Dependent demand is related to the demand that is on the requirements of other items in the manufacturing process for example the requirement of components or parts is based on the demand for the finished products (Toomey, 2012). Demand management is used in the study to provide background information as it can relate on the end users demand at Navachab gold mine.

#### **2.2.8 Related studies**

A study carried out by (Nyabwanga & Ojera, 2012) on Inventory management practices and business performance for small-scale enterprises in Kenya revealed that most of the SMEs in Kenya struggle with effective inventory management due to factors such as staff incompetency and poor management styles. The study recommended that companies consider training their employees on inventory management. Relatedly Akandipe (2014) carried out another study on Inventory management: A tool for optimal use of resources and overall efficiency in manufacturing SMEs where the researcher's finding agreed with those of (Nyabwanga & Ojera, 2012).

An Assessment of the Factors Influencing Effectiveness of Inventory Control: Ministry of State for Provincial Administration and Internal Security, Nairobi – Kenya by Kariuki (2013) argued the lack of technology to optimize store management to be influencing inventory control thus the research has stresses the need to support technology in

inventory management systems. Warehouse management is very crucial in maintaining a good inventory concludes a study carried out by (Lopez, 2013). In another study carried out by Joseph (2014) on Inventory management techniques and their importance indicated that an organization should adopt the best inventory techniques for its specific needs. It also emphasizes the difficulties of obsolete and expiry goods that comes with end users change in commodities.

## **CHAPTER 3: RESEARCH METHODS**

### **3.1 Research Design**

This study intended to gather data from the employees working in the Ore Processing, Engineering, Human Resources Management and Procurement department at Navachab using questionnaires and interviews for primary data collection. A purposive random sampling method was used to select the four departments. The interview questions and the questionnaire was developed based on the research objectives. The questionnaire method of collecting data was used as it is easy to administer and can easily generate fast and straight forward response. Annual reports and other publications were also used to acquire secondary data. The research adopted a sequential explanatory mixed methods approach using quantitative followed by qualitative research methodology.

### **3.2 Population**

Navachab has 128 employees who are involved in the ordering of stock from the warehouse including the procurement department itself. The population was therefore 128 Navachab employees from the different selected departments.

### 3.3 Sampling

The Taro Yamane formula for calculating sample size for academic research was used. This method for sample size calculation was formulated by a statistician Tara Yamane. This method uses the population under study (N) and the margin of error (e) to calculate the sample size(n) to be used by the researcher. This study covered a sample of 97 Navachab Gold Mine employees from the Ore Processing, Engineering and Human Resources Management and Procurement department.

$$n = N/(1+N(e)^2)$$

$$n = 128/(1+128(e)^2) = 97$$

### 3.4 Research instruments

In order to collect primary data a questionnaire was distributed to employees from the Ore processing, Engineering and Human resources management department. The questionnaire comprised of both closed ended and open-ended questions, and it was self-administered. Face to face interviews were also conducted with all staffs at procurement in order to collect in-depth source information. Secondary data was obtained from Navachab publications and reports on Procurement.

### 3.5 Procedure

The researcher handed out 97 questionnaires to the participants from Ore Processing, Engineering, Human Resources Management and Procurement department at Navachab. From the 97 questionnaires 93 responses were obtained giving a response rate of 95.88%. Some questionnaires had unclear information and some were not fully completed hence could not be used in the study. For this reason, a 100% response rate was not achieved.

According to Anichebe and Agu (2013) a response rate of 50% or more is adequate for analysis, which shows that 95.88% was an acceptable basis for drawing conclusions for this study. The researcher interviewed 37 participants from the procurement department for first hand data collection. The procurement department is the functional department for inventory management hence they were both interviewed and also had to answer the questionnaire. Secondary data collection was collected from reports and journals available from the departments.

### 3.6 Data analysis

Nvivo was used for qualitative Data Analysis. Qualitative data was transcribed, organized and coded using thematic analysis to identify and link patterns and themes to each other. The Statistical Package for Social Science was used for quantitative data analysis to test for correlations and internal consistencies of the data. The data collected was presented after the analysis in the form of graphs, pie charts, figures and tables. The study further adopted multiple regression models at 5% level of significance to establish the strength and direction of the relationship between the independent variables and the dependent variable (improved production). A multiple regression analysis was used to determine the relationship between the independent and the dependent variables. The following multiple regression formula was applied:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \epsilon$$

Where;

Y = Dependent Variable (Improved production in %),

$\beta_0$  = the constant or coefficient of intercept.

From X1 = End users,

X2= management style,

X3= inventory management systems,

X4= staff competency,

$\epsilon$  =Error factor,

$\beta_1 - \beta_4$ =Correlation coefficients

#### **4. Research Ethics**

The researcher obtained consent from the Managing Director of Navachab to access the company's information. The respondents were informed of their rights of withdrawal from participating should they feel the need to withdraw. The respondents were also informed that their names will be kept anonymous. Information gathered was kept confidential and safe and was only used for the purpose of this study as well as for better improvements at Navachab gold mine regarding inventory management systems for production improvement.

#### **CHAPTER 4: RESULTS & DISCUSSION**

In this chapter, the research for a relationship between inventory management systems efficiency and production improvement at Navachab gold mine was established. The section discussed factors affecting inventory management for production improvement at Navachab gold mine. This chapter discussed both results from the interview questions as well as the questionnaire questions.

#### **4.1 Investigation into the inventory management system's efficiency at Navachab Gold Mine for production improvement**

The main objective of the study was to investigate the inventory management system's efficiency at Navachab Gold Mine for production improvement. The indicators of this comprised of Inventory management techniques used at Navachab and the effectiveness of this inventory management techniques in production improvement at Navachab gold mine.

##### **4.1.1 Inventory management techniques used at Navachab gold mine**

Navachab gold mine, makes use of The Action Level methods of inventory management (ALM) to determine what to order and when to order. This is a basic method of managing stock by quantity. This is done by means of fixing for each commodity stock levels which are recorded in the stock control system and subsequently used as a means of indicating when some action is necessary. A minimum stock level is used to trigger the procurement department to put in an order from the supplier of the vendor. When used correctly, this technique is beneficial in that the right amount of stock is ordered at the right time.

Navachab gold mine also uses the central purchasing system in which only the procurement department is responsible for purchasing commodities from the suppliers. Supervisors from the different departments at Navachab Gold Mine put in purchase requisitions to the procurement department to notify them on what item they would like to order from the warehouse. The warehouse then creates a purchase order for the item. This policy allows for only the procurement department to order items from suppliers and deliver them to the end users who are the different departments at Navachab Gold Mine. The purchasing policy used at Navachab Gold Mine currently is Speculative Purchasing

which is the strategy used because of the fluctuation in prices for goods from suppliers. This means when prices are exceptional then the procurement department orders goods in larger bulks this saves the company on costs form orders.

The 37 respondents from the procurement department were asked on the experience and competency they have in using the current inventory management technique at Navachab gold mine. The findings are shown in table 4.1. Where 7 respondents have less than 3 years of experience, majority (15) of the respondents had 3-5 years of experience, while 10 respondents had 5-10 years of experience and 5 respondents had above 10 years of experience. This indicates that Navachab has experienced and competent staffs in its current inventory management technique, experience staffs eventually become experts this is backed up by (Lopez, 2013) who recommends the importance of have experienced staff and how much more beneficial they become to the company at large.

**Table 4.1: Number of years of experience for the procurement department staff**

<b>Years of experience in inventory management</b>	<b>Respondents</b>
Less than 3	7
3 – 5	15
5 – 10	10
Above 10	5
Total	37

Source: primary source

#### 4.1.2 The effectiveness of this inventory management techniques in production improvement at Navachab gold mine.

The respondents in response to the questionnaires answering to how effective the current inventory management techniques is to the production improvement is highlighted in table 4.2. The researcher also had to find out whether the respondents understands the extent to which proper inventory techniques can be effective. Among the Importance that were given out included increased in services delivery, customer's attraction, reputation of organizations as well as increase in production and organization's profits as shown in table 4.2.

**Table 4.2: inventory management system influences organization's production**

<b>Response</b>	<b>Number of Respondents</b>
Proper inventory management increases organizations production and services delivery	<b>45</b>
Proper inventory management attracts customers to the organization	<b>10</b>
Proper inventory management rewards the company reputation	<b>7</b>
Proper inventory management attracts customers to buy organization's products	<b>31</b>
<b>Total</b>	<b>93</b>

### Source: Primary Data

From table 4.2, 45 respondents said that proper inventory management increases organizations production which translates to profits and services delivery since everything is properly arranged especially in the departments of production. On the other hand, 10 of the respondents said that a proper inventory management system attracts customers to the organization of which it has enabled the company to flourish on the Namibian market. The study also finds that 7 of respondents agreed that the use of good and proper inventory management system rewards the company a good reputation. The findings also indicate that 31 of the respondents said that proper inventory management attracts customers to buy organization's products this making a company get more profits leading to its development.

From the respondents working in the procurement department, 70% claims that the current technique is very effective for the mine. Respondent 2 added that:

*"We have been using these inventory management techniques since I have worked here for the past 11 years and it has been very effective, we can easily control our stock levels"*

On the other hand, 30% of the responded argues that the current technique is not effective as it does not count for commodities taken out of store through theft as they are never recorded as out. Respondent 13 further added that:

*"the theft here is too much, maybe it's because management's lack of oversight but we really lose inventory due to staff theft..... it starts simple I mean some people take*

*small items, and you know the more and more people take from the inventory the more the inventory reduces.”*

*“sometimes it is not about theft or management’s lack of oversight but due to unforeseen demand, sometimes we get we have periods when we have more demand than we stocked for and really it affects our inventory management systems”* stated respondent 23.

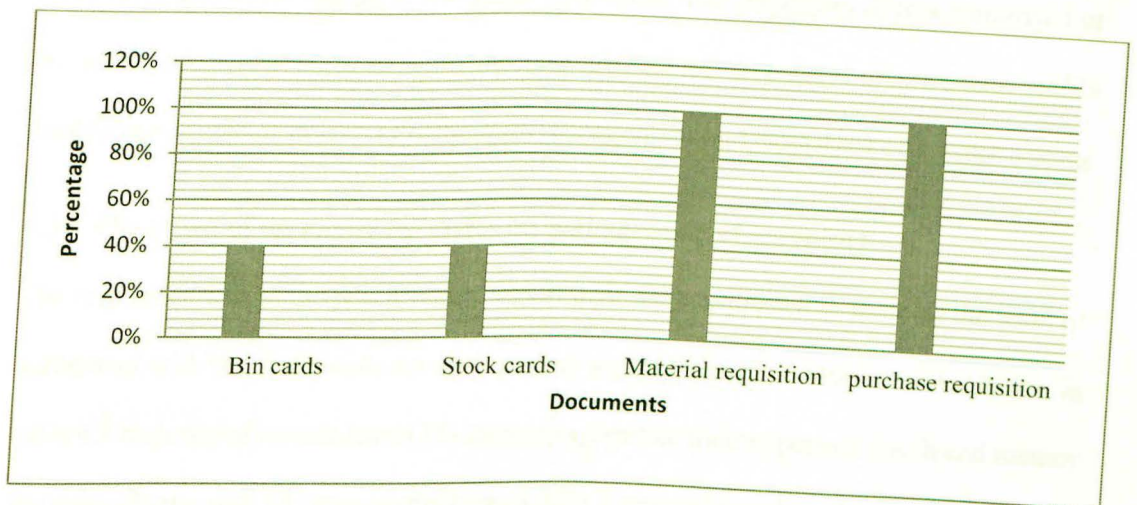
#### **4.2 Factors contributing to high non-moving inventory at Navachab Gold Mine**

The first specific objective of this study was to investigate on factors that contribute to high non-moving inventory at Navachab gold mine. The indicators of this comprised of inventory techniques used, purchasing objectives and policies used at Navachab gold mine.

##### **4.2.1 Inventory management techniques on non-moving inventory at Navachab gold mine**

According to the procurement report of 2019, Navachab recorded 53% non-moving, 27% of slow moving and 20% fast moving inventory (Xavier, 2019). Sheakh (2018) argues that an effective inventory management system should give a company less than 30% non-moving inventory, and at least 50% or more of fast moving inventory. According to this report, Navachab experience high non-moving inventory with the use of its current inventory management systems. In the report Xavier (2019) highlighted that the use of ALM inventory technique has demonstrated good performance over the past years except for the year 2019 where the mine experienced high non-moving, understock and overstock.

**Figure 4.2: Documents in inventory management used at Navachab gold mine**



**Source: primary source**

The data collected indicated that the use of Bin cards and stock cards is 40% respectively while the use of material and purchase requisition are at 100%. This indicates that Navachab inventory systems makes more use of Material and Purchase requisition documents where by the individuals from the Ore processing, Engineering and Human resources departments notify the purchasing(procurement) department the need for the raw material used in the production. According to Dimitrios (2014) the use of purchase

requisition is used by companies to prevent fraud by allowing only the procurement department to place orders with the vendors and not any other department. From this finding it was discovered that Navachab gold mine has control over fraud through the use of purchase requisitions and the respondents argued that this was very helpful in their operations.

### **4.3 Factors contributing to Understock and Overstocking at Navachab Gold Mine**

The second specific objective of this study was to investigate on factors that contribute to understock and overstocking at Navachab gold mine. The indicators of this comprised of the effect of management style on the management of inventory, procurement staff's qualifications, use of Inventory techniques management on Understock and overstocking.

#### **4.3.1 The effect of management styles on management of inventory**

The respondents from the procurement department were requested to indicate the level of agreement with the statements on management styles from their superiors. As shown in table 4.3 majority of respondents (22) strongly agree that their superiors coach and mentor the subordinates and 12 respondents agree while 3 respondents do not agree on coaching and mentorship from the superiors. The findings also indicated that 18 respondents strongly agreed that the superiors embrace participative leadership and 14 respondents agreed while 5 respondents disagree with the embraced participative leadership from the superiors. According to Ballou (2014) coaching and mentorship is essential in an organization as it helps staffs to be more focus and be aligned with business goals and objectives.

In another request the respondents from the procurement department were asked their level of agreement on whether superiors are skilled in inventory management, 15

respondents strongly agreed, and 17 respondents agreed while 5 respondents disagreed with the statement. These findings have indicated that there is great participation from management in the inventory management which greatly contributes to better decisions on stock controls. This is backed up by Pandey (2015) who states that great participation of managers helps an organization as to shape and be in control of their department, to lead and to make executive decisions to ensure the goals and objectives set are met.

In the last request the respondents from the procurement department were tasked to give their level of agreement on there was training and development given to the staffs regarding inventory management, 3 respondents strongly agreed, 4 respondents agreed while 30 respondents disagreed with the statement. These findings have indicated that there is very minimal/no training and development is given to Navachab Gold Mine employees from the procurement department regarding management of inventory. This then entails there is no new skills development for the staffs and this may have an impact on management of inventory.

These findings disagree with Ayad (2011) who argued that employees need re-fresher training to allow for corrections on mistakes they might have been doing unknowingly in the past. Training and development is also needed for staffs to gain new knowledge and skills. This may help the organization as these employees may bring in new suggestion and new technology that may help the organization do better in the management of inventory. In agreement with Ayad (2011), Organizations should send their employees for training and development for new skills (Bierderman, 2014).

**Table 4.3: Management style at Navachab Gold Mine**

Statement	Strongly agree	Agree	disagree	total
Our superiors coach and mentor the subordinates	22	12	3	37
Our superiors have embraced participative leadership	18	14	5	37
Our superiors are skilled in inventory management	15	17	5	37
There is training and development for staffs	3	4	30	37

**Source: primary data**

Majority of respondents from the procurement departments expressed their gratitude in superior contribution and participation into inventory management. Respondent 32

stated that: *“In most of the cases when management intervention is required, management always intervene and it really helps”*

On the other hand, minority of the respondents from the procurement department claims that the participation from management is most of the times what makes the work difficult as they end up failing to control their stock levels, which may result in understock or overstock. Respondents 27 stated that:

*“We are faced with too many red tapes, we are not able to manage our inventory properly because we are constantly being told how to this or do that, it’s like we don’t know our own jobs and to me this contributes to the challenges we face here”*

Respondent 17 adds that:

*“Since the introduction of ‘Kaima’ in the year 2019, management introduced cost cutting strategy, this strategy is not well defined for us, we are told to cut on cost and because of that we sometimes end up with understock”*

#### **4.3.2 Procurement staff’s qualifications**

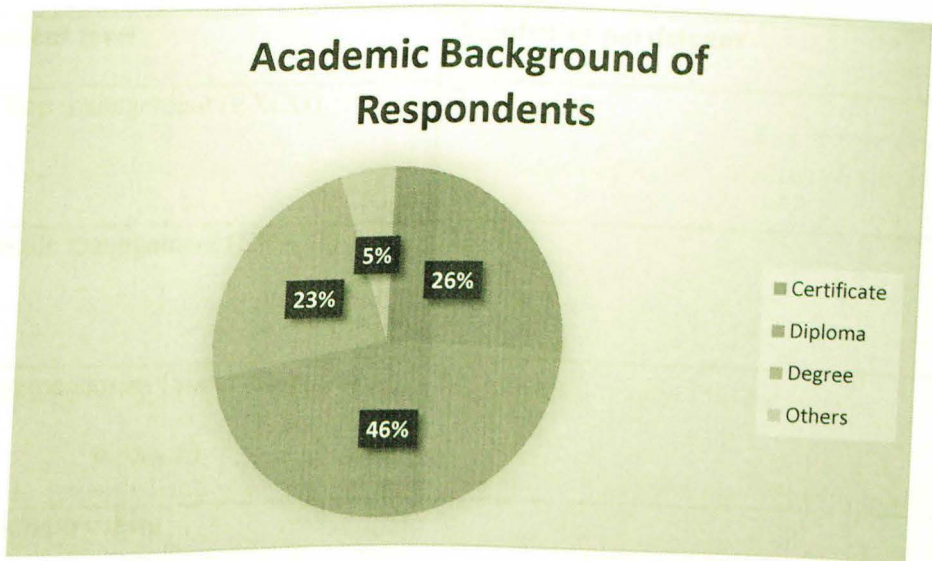
From the figure 4.3, 26.0% of the respondents had certificates, 46% had diplomas, 23% had degrees, while 5% had others qualifications. All respondents (100%) were found to have at least got some form of schooling. Whereby 26% had acquired post-secondary education certificate, had acquired secondary education and primary education. The implication being that the level of education is directly proportional to the degree of access to ordering stocks from the company stores.

The majority of respondents 46% had gone through Diploma and this was because of the level of understanding required in ordering/purchasing from the company stores. Requirements of applications such as SAP is a must have. 24% of respondents comprised of Degree who were also instrumental for the study for they quality to perform some duties in several official roles. They are also found occupying medium posts as they go on up grading.

The least respondents had acquired primary education and these were found to be mostly linked to mine offices indirectly. They are mostly involved in the collection and packing of stock in the different departments, hence were also significant. From figure 4.3 we can pick up that the procurement department at Navachab gold mine is very well equipped with educated staffs which entails potential in better understanding and performance of

the jobs required from them. It is crucial to have the right people at the right place for the job to be carried out right says (Hugo B. , 2012).

**Figure 4.3: Academic background of procurement staffs/respondents**



**Source: Primary data**

The Participants as shown in table 4.4 were ranked according to their managerial positions as defined below:

**Top management (EXCO):** This is made up of the executives of Navachab Gold Mine e.g. the Managing Director, CEO, CFO and other.

**Middle management (EPSCO):** This is made up of all the managers to that reports to EXCO e.g. Ore processing managers, Finance manager etc.

**Low management (Supervisors and foremen):** This is made up of all supervisors and foremen, they report to OPSO. Table 4.4 represents the management who were participants in this study.

**Table 4.4: Managerial participants**

Management level	Number of participant
Top management (EXCO)	2
Middle management (EPSCO)	12
Low management (Supervisors and foremen)	15

**Source: primary data**

#### **4.3.3 Effect of inventory management techniques on Understock and overstocking.**

Navachab gold mine uses the central purchasing system in which only the procurement department is responsible for purchasing commodities from the suppliers. This also means

that the procurement department easily identifies commodities on sale and can be bought on a cheaper price. According to some respondents during sales the company can save money from buying extra bulks of commodities, it is during this time that the warehouse incurs overstock he adds. Respondents also indicated that understock at Navachab is mostly a result of theft and inaccurate stock counting. Respondent 13 from the procurement department indicated that:

*“when end users experience un usual consumptions or emergency stock we end up have less stock as required as we must still process orders from suppliers with their lead time”*

Respondent 22 from the procurement added that:

*“Most of the times we are understocked as a result of delays from the suppliers”*

#### **4.4 Factors contributing to Expiry and Obsolete stock at Navachab Gold Mine**

The third specific objective of the study was to investigate the factors that contribute to high expiry and obsolete stock. The indicators of this comprised of the end users change on commodities, Forecasting methods of inventory levels.

##### **4.4.1 Effect of end user’s decisions on use of commodities from the warehouse**

Respondents from the different departments were requires to give their level of agreement on factors contributing to expiry and obsolete stock at Navachab gold mine. The findings as showed in table 4.5, 62 respondents strongly agreed that Change in commodities by end users results in expiry and obsolete stock at Navachab gold mine. These finding agreed with Xavier (2019) who argued that end users change in commodities options is continuously high resulting in high obsolete stock. From the finding 20 respondents agree

that Change in commodities by end users results in expiry and obsolete stock at Navachab gold mine, while 11 responded disagreed with the same statement. This is backed up by Cachon (2014) who gives more emphasis on the importance of demand management

**4.4.3 Effect of forecasting methods of inventory levels**

From the findings 58 respondents strongly agreed Poor forecasting methods of inventory levels from end users. This agreed to Ayad (2011) who argued that maintaining optimum levels of inventory is important in an organization because excess inventory results in stock holding costs such as rental charges, opportunity costs, obsolescence costs, breakages and pilferage. The findings also showed that 19 respondents agreed that poor forecasting methods of inventory levels from end users, while 16 respondents disagreed.

**Table 4.5: Factors contributing to Expiry and Obsolete stock at Navachab Gold Mine**

Statement	Strongly agree	Agree	disagree	total
Change in commodities by end users results in expiry and obsolete stock at Navachab gold mine	62	20	11	93
Poor forecasting methods of inventory levels from end users	58	19	16	93

**4.5 The benefits of inventory management system**

Respondents were also finally required to give an agreement level on statements regarding the benefits of the current inventory management techniques used at Navachab gold mine. As showed in table 4.6, 33 respondents agreed that the current inventory management practices contribute greatly to efficient production at Navachab gold mine. From the list of respondents 15 respondents from the different departments agreed that the current inventory management systems help in inventory planning and scheduling at Navachab gold mine. From the finding only 7 respondents agreed that cost reduction in production costs is a result of the current inventory management practices at Navachab gold mine. From the findings 23 respondents agreed that the internal production coordination at Navachab gold can be improved by proper inventory management systems.

Respondent 24 from the procurement departed states that:

*“I believe that proper inventory management systems will increase production in any organization”*

**Table 4.6: The benefits of inventory management system**

<b>Benefits of Inventory management practices</b>	<b>Number of respondents</b>
The current Inventory Management practices contribute greatly to efficient production at Navachab gold mine.	33
The current Inventory Management systems helps in inventory planning and scheduling at Navachab gold mine.	15

The current Inventory Management system helps in effective stores management at Navachab gold mine.	15
Cost reduction in production costs is a result of the current inventory management practices	7
Internal production coordination at Navachab gold can be improved by proper inventory management systems	23
<b>TOTAL</b>	<b>93</b>

**Source: Primary data**

Proper control of inventory plays a big role in enabling operations such as production, purchases, sales, marketing and financial management to be carried out smoothly (Zuva & Choga, 2016)

#### **4.6 Inferential Statistics**

##### **4.6.1 Correlations Analysis**

The study used Pearson correlation to examine the association between the independent variables (End users, management style, inventory management system and staff competency) and the dependent variable (Improved production at Navachab gold mine). According to the findings End users have a positive influence on improved production at Navachab gold mine ( $r=0.976$ ,  $p\text{-value}=0.010$ ). The study also found that there exist a positive association between management style and improved production at Navachab gold mine ( $r=0.974$ ,  $p\text{-value}=0.012$ ). The findings further indicate that inventory management systems have a positive influence on improved production at Navachab gold mine ( $r=0.978$ ,  $p\text{-value}=0.015$ ). Further, the findings show that staff competency has a

positive influence on improved production at Navachab gold mine ( $r=0.977$ ,  $p$ -value= $0.020$ ).

#### 4.6.1 Regression Analysis

A multiple regression analysis was also carried out to determine the relationship between dependent variable and the four independent variables. The regression equation was;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$$

Where;

$Y$  = Dependent Variable (Improved production in %),  $\beta_0$  =the constant or coefficient of intercept. From  $X_1$  = End users,  $X_2$ = management style,  $X_3$ = inventory management systems,  $X_4$ = staff competency,  $\epsilon$  =Error factor,  $\beta_1 - \beta_4$ =Correlation coefficients

The R-Squared is used to show the proportion of variance in the dependent variable that can be explained by the independent variables. From the findings, the R-squared in this study was 0.7476, this then shows that the four independent variables (End users, management style, inventory management system and staff competency) can explain 74.76% of the variation in the dependent variable which is the improved production at Navachab gold mine. It therefore means that other factors not considered in this study explain 25.24% of the variation in the dependent variable, which is improved production at Navachab gold mine in relations to inventory techniques. From the findings, the analysis of variance in this study was used to determine whether the model is a good fit for the data.

There was a need to indicate if the model used was significant and this was determined by comparing the  $p$ -value and the 5% significance level. Since the  $p$ -value was found to be

0.010 which was less than 0.05, the model was statistically significant establishing how End users, management style, inventory management system and staff competency affect production improvement at Navachab gold mine. In addition, the F-calculated was 1073.612 which is more than the F-critical of 2.47, this clearly indicated that the models were fit in establishing the influence of the four independent variables on the dependent variable.

The regression model was;

$$Y = 0.047 + 0.198X_1 + 0.178X_2 + 0.299X_3 + 0.223 X_4 + \epsilon$$

From the findings, there is a positive significant relationship between end user's decisions and improved production at Navachab god mine with a regression coefficient of 0.198. This shows that a unit improvement in end users decisions would lead to a 0.198 improvement in the management of inventory hence improved production at Navachab gold mine. The p-value (0.010) was less than the significance level (0.05), hence the relationship was significant.

The results also showed that there is a positive significant relationship between management style and management of inventory for production improvement at Navachab gold mine with a regression coefficient of 0.178. This shows that a unit increase in management style would lead to a 0.178 improvement in the management of inventory for production improvement at Navachab gold mine.

The relationship was significant as the p-value (0.012) was less than the significance level (0.05). The findings also showed that there is a positive relationship between inventory management systems and management of inventory for production improvement with a

regression coefficient of 0.299. This indicates that a unit improvement in inventory management systems would lead to a 0.299 improvement in the management of inventory for production and Navachab gold mine. The relationship was found to be significant as the p-value (0.015) was less than the significance level (0.05).

Lastly, the findings show that there is a positive significant relationship between staff competency and management of inventory for production improvement at Navachab gold mine with a regression coefficient of 0.223. This indicates that a unit improvement of staff competency would lead to a 0.223 improvement in the management of inventory for production improvement at Navachab Gold Mine. This relationship was significant as the p-value (0.020) was less than the significance level (0.05).

## **CHAPTER 5: CONCLUSIONS & RECOMMENDATIONS**

### **5.1 Conclusion**

The study concludes that end user's decision such as change in commodities options/demands and poor forecasting methods of inventory levels have a positive and significant influence on the management of inventory for production improvement at Navachab gold mine. The study found that an improvement in the way end users make decisions on change in commodities, and how they communicate emergency demand will improve management of inventory and hence production improvement. The study also found that an improvement in forecasting of inventory levels by end users will help with elimination/ reduction of obsolete stock as well as reducing the risks that comes with under and overstock hence improving management of inventory and production improvement at Navachab gold mine.

The study also concludes that management style has a positive and significant influence on the management of inventory for production improvement at Navachab gold. The study found that superiors in the procurement department coach and mentor their subordinates but it further concludes that coaching and mentorship is not done to all the staffs that may need coaching and mentorship. The study also found out that superiors in the procurement department at Navachab gold mine were skilled in inventory management. Furthermore, the study found out that superiors at Navachab Gold Mine embraced participative leadership. In addition to participative leadership, the study found that some of the decisions made by superiors makes it difficult for the procurement department to keep up with the proper inventory levels as required by its end users. This decision includes

decision of cost cutting, an introduction of "Kaima" which requested a reduction in all the stock level, this meant the minimal stock levels for all the commodities were reduced.

The study further concludes that inventory management systems/techniques has a positive and significant influence on the management of inventory at Navachab Gold Mine for production improvement. The study found out that proper inventory techniques/systems plays a major role in the management of inventories. It was further concluded that the current management techniques used at Navachab Gold Mine are prone to errors as there is too much use of manual work. Although the current inventory systems used at Navachab Gold Mine are not prone to fraud because of the use of the central purchasing system, the study concluded that theft of commodities from the mine affects production at Navachab Gold Mine.

In addition, the study revealed that the current inventory systems use purchase and material requisitions more than it uses bin cards and stock cards. Results also concluded that Navachab Gold Mine uses the pricing strategy of buying more bulk quantities of commodities when they are on sale, this contributes highly to overstocked and might lead to expiry of goods. The study revealed that employees of Navachab Gold Mine believe in proper inventory management systems for a better production improvement. The study concluded that should proper inventory management systems be introduced at Navachab Gold Mine then there will be an improvement in production. It can therefore be concluded that inventory management systems efficiencies are related to Navachab gold mine's production.

The research also concluded that staff competency has a positive and significant influence on the management of inventory for production improvement at Navachab Gold Mine.

The study found out that the staff in the procurement and accounts is experienced with majority having more than 5 years of experience and employees dealing with inventory have skills and educational background required. Further, the study established that the employees in procurement and accounts have not been receiving regular training and development course.

## **5.2 Recommendations**

The study concludes that end user's decision such as change in commodities options/demands and poor forecasting methods of inventory levels have a positive and significant influence on the management of inventory for production improvement at Navachab gold mine. The study therefore recommends that an improvement in the way end users make decisions on change in commodities. Recommendations to introduce a policy to allow exciting stock to be completely exhausted from the warehouse before the new changed commodity stock can be used, this will reduce the high number of non-moving and obsolete stock. To eliminate poor forecasting of inventory levels, Navachab Gold Mine gold must invest in training and development for end users on demand forecasting methods for inventory levels. This will allow for the procurement department to keep up with the end users demand and store the right commodities in the right quantities at the right time which will improve management of inventory and hence production improvement.

The study found that superiors in the procurement department coach and mentor their subordinates but it further concludes that coaching and mentorship is not done to all the staffs that may need coaching and mentorship. It is therefore recommended that Navachab Gold Mine introduce consistency in coaching and mentorship amongst their staffs. The

study found out that the introduction of “Kaima” has endorsed reduction in minimum stock levels in all the different commodities at the warehouse. It is therefore recommended that “Kaima” rules and policies be reviewed with the aim to allow the procurement department to have enough stock at all times and eliminated the understock of inventory.

Purchase policy of Navachab Gold Mine which includes buying in larger bulks in times of sales and discounts from supplies was found to be the cause of high expiry stock. Keeping inventory levels high in order to save company cost through sales or discount is a dangerous action. Eventually, excess inventory expiry and obsolete stock will accrue, ruling out long-term success and leading to financial issues. It is recommended that Navachab Gold Mine makes use of the modern inventory management software. Which helps in reducing inventory levels by determining appropriate order quantities while simultaneously improving product availability through exact order planning and optimized, automated stock replenishment (Barnet, 2016). This will than mean that Navachab Gold Mine will have proper inventory management techniques which will be efficient as the correct amount of commodities are always available at the right place and right time.

The research further concluded that the current management techniques used at Navachab Gold Mine are prone to errors as there is too much use of manual work. It is recommended that Navachab Gold Mine looks into new technology that would reduce the use of manual data entries which is prone to errors. Installation of a computerized package to deal with recording of inventory so as to avoid unintentional errors. The study also concluded that theft of commodities from the mine affects production at Navachab Gold Mine. It is recommended that Navachab Gold Mine make use of strict control measures and

inspecting system to detect theft around the mine, installation of camera at the right places will also be able to help identify theft. It is also recommended that the mine introduce systems that allow for a continuous stock taking on an interval to be able to easily notice the missing or damaged stock. Navachab Gold Mine employees other than stores officers should not be allowed into the stores unless it is strictly on business.

The study established that the employees in procurement and accounts have not been receiving regular training and development course. Training of staffs allows for them to acquire new knowledge that they might have missed out, it also allows for them to work on things they have been doing wrong unknowingly for the past years. It is therefore recommended that Navachab Gold Mine sends its staffs for re-fresher trainings and for staff development to improve their skills and knowledge on inventory management. This may improve inventory tracking by use of new information and technology in improving inventory management.

### **Areas for Further Research**

This study focused on Navachab Gold Mine and hence its findings are specifically for Navachab Gold Mine and cannot be generalized to the rest of the mines elsewhere. This study therefore suggests similar studies on the factors affecting management of inventory and investigations into inventory techniques efficiencies for production improvement in other organisations. In addition, similar studies can be conducted in other institutions in Namibia other than mines. The study found that the factors studies could only explain 74.76% of the factors affecting management of inventory at Navachab Gold Mine. The study therefore suggests further studies to establish other factors affecting the management of inventory at Navachab Gold Mine.

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As partial fulfillment of the award of master's degree in business administration at the University of Namibia, I am Yatsieganewa Ester Kalipi, conducting a research on "An Investigation into Inventory Management System's Efficiency for Production Improvement At Navachab Gold Mine". I kindly request you to spare a few minutes of your busy schedules to fill this questionnaire to enable me accomplish this task. Your honest and sincere responses are highly appreciated as the outcome from the study will strictly be used only for academic purposes and Navachab Gold Mine recommendations and shall be treated with utmost confidentiality. I thank you very much for your cooperation. Thank you in advance for any follow up you allowed to contact the researcher on mobile number 081-637518.

Answering Model: Tick the appropriate answers or write in the space provided.

**SECTION A: BACK GROUND INFORMATION ON THE RESPONDENT (Please**

tick in the appropriate Box)

1. Age: 20 – 30 years

31 – 40 years

41 – 50 years

51 – 60 years

60 and above

2. Marital status:

## APPENDIX A: QUESTIONNAIRE

Dear respondent,

As partial fulfillment of the award of master's degree in business administration at the University of Namibia, I am Taleingenawa Ester Kalipi, conducting a research on "*An Investigation into Inventory Management System's Efficiency for Production Improvement At Navachab Gold Mine*". I kindly request you to spare a few minutes of your busy schedules to fill this questionnaire to enable me accomplish this task. Your honest and sincere responses are highly appreciated as the outcome from the study will strictly be used only for academic purposes and Navachab Gold Mine recommendations and shall be treated with utmost confidentiality. I thank you very much for your cooperation. Thank you, in advance for any follow up you allowed to contact the researcher on mobile number 081-6837518

Answering Mode: Tick the appropriate answers or write in the space provided.

### SECTION A: BACK GROUND INFORMATION ON THE RESPONDENT (Please tick in the appropriate Box)

1. Age: 20 – 30 years

31 – 40 years

41 - 50 years

51 – 60 years

60 and above

2. Marital status:

Single

Married

3. Level of Education: (specify) .....

4. Designation.....

5. Which department do you belong to?

Please specify.....

6. How many years have you spend at Navachab Gold Mine? .....

**SECTION B: INVENTORY MANAGEMENT SYSTEMS USED BY NAVACHAB GOLD MINE AND THE NEED FOR PROPER INVENTORY MANAGEMENT**

7. What type of stock do you hold? Please tick the appropriate box

1. Raw materials

2. Work in progress

3. Finished goods.

4. Stock supplies.

5. All the above

8. The following statements talks on proper inventory management, please tick as you agree with the statements. Skip the statement if you disagree with it.

1. Proper inventory management increases organizations production and services delivery

2. Proper inventory management attracts customers to the organization

3. Proper inventory management rewards the company reputation

4. Proper inventory management attracts customers to buy organization's products

9. Which documents are used in recording inventory information? Please tick appropriate inside box

1. Bin card Material

2. Requisition note

3. Stock cards

4. Purchase requisition note

5. Others (specify).....

**SECTION C: IMPORTANCE OF INVENTORY MANAGEMENT PRACTICES ON PRODUCTION AT NAVACHAB GOLD MINE.**

10. The following are benefits of inventory management at Navachab gold mine (tick appropriate box as you agree, skip if you disagree).

1. The current Inventory Management practices contribute greatly to efficient production at Navachab gold mine.

2. The current Inventory Management systems helps in inventory planning and scheduling at Navachab gold mine.

3. The current Inventory Management system helps in effective stores management at Navachab gold mine.

4. Cost reduction in production costs is a result of the current inventory management practices.
5. Internal production coordination at Navachab gold can be improved by proper inventory management systems.

**SECTION D: CHALLENGES FACED IN APPLYING INVENTORY MANAGEMENT PRACTICES AT NAVACHAB GOLD MINE**

11. The following statements consists of some factors that may results in high expiry and obsolete stock levels. Please tick the appropriate box.

Statement	Strongly agree	Agree	disagr
Change in commodities by end users results in expiry and obsolete stock at Navachab gold mine			
Poor forecasting methods of inventory levels from end users results in expiry and obsolete stock at Navachab gold mine			

11. Mention any other 3 factors contributing to high non-moving stock, expiry, obsolete, understock and overstock at Navachab Gold Mine.

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12. What suggestions do you have regarding the effectiveness and efficiency of inventory management towards the organizational efficiency of Navachab Gold Mine?

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**Thank you for sparing your precious time and God bless you**

## APPENDIX B: INTERVIEW QUESTIONS

Dear respondent,

As partial fulfillment of the award of master's degree in business administration at the University of Namibia, I am Taleingenawa Ester Kalipi, conducting a research on "*An Investigation into Inventory Management System's Efficiency For Production Improvement At Navachab Gold Mine*". Thank you for already partaking in this study during the questionnaire session, I kindly request you to spare another few minutes of your busy schedules to answer a few questions regarding this topic to enable me accomplish this task. Your honest and sincere responses are highly appreciated as the outcome from the study will strictly be used only for academic purposes and Navachab Gold Mine recommendations and shall be treated with utmost confidentiality.

1. For how long have you worked with inventory management

<b>Years of experience in inventory management</b>	<b>Answer</b>
Less than 3	
3 – 5	
5 – 10	
Above 10	
Total	

2. What factors contributes to high non-moving inventory at Navachab Gold Mine?

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3. What factors contribute to high expiry and obsolete inventory at Navachab Gold Mine?

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4. What factors contribute to high understock and overstock at Navachab Gold Mine?

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5. How does inventory management affect operations of Navachab Gold Mine?

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6. What is the efficiency of the current inventory management techniques on production performance at Navachab Gold Mine?

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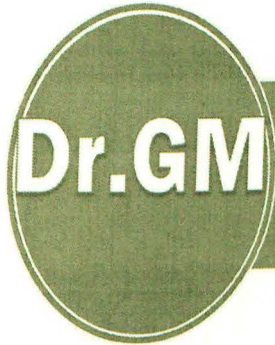
.....

7. The following statement are based on management style at Navachab Gold Mine in terms of inventory management. Please state whether you strongly agree, agree or disagree with them.

Statement	Strongly agree	Agree	disagree
Our superiors coach and mentor the subordinates			
Our superiors have embraced participative leadership			
Our superiors are skilled in inventory management			
There is training and development for staffs			



## APPENDIX C: LANGUAGE EDITING CERTIFICATE



The Rev. Dr. Greenfield Mwakipesile

ThD. MBA. HBS | mwakipg@outlook.com

### CONTACT

PO Box 99539,  
UNAM,  
Namibia

### LANGUAGE & COPY-EDITING CERTIFICATE

28<sup>th</sup> June 2021

**RE: LANGUAGE, COPYEDITING AND PROOFREADING OF TALEINGENAWA ESTER KALIPI'S THESIS FOR THE MASTER OF BUSINESS ADMINISTRATION DEGREE OF THE NAMIBIA BUSINESS SCHOOL OF THE UNIVERSITY OF NAMIBIA**

This certificate serves to confirm that I copyedited and proofread **TALEINGENAWA ESTER KALIPI'S** Thesis for the **MASTER OF BUSINESS ADMINISTRATION DEGREE** entitled: **AN INVESTIGATION INTO INVENTORY MANAGEMENT SYSTEM'S EFFICIENCY FOR PRODUCTION IMPROVEMENT AT NAVACHAB GOLD MINE**

I declare that I professionally copyedited and proofread the thesis and removed mistakes and errors in spelling, grammar, and punctuation. In some cases, I improved sentence construction without changing the content provided by the student. I also removed some typographical errors from the thesis and formatted the thesis so that it complies with the University of Namibia's guidelines.

I am a trained language and copy editor and have edited many Postgraduate Diploma, Masters' Thesis, Dissertations and Doctoral Dissertations for students studying with universities in Namibia, Zimbabwe, Eswatini, South Africa and abroad. I have also copy-edited company documents for companies in the region and abroad.

Please feel free to contact me should the need arise.

Yours Sincerely,

A handwritten signature in black ink, appearing to read "Dr. Greenfield Mwakipesile".

The Rev. Dr. Greenfield Mwakipesile



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