

“Assessing the Water Supply Chain Activities in Tanzania Water Authorities, a case of Arusha region”

Matari, Davis Festo, *Prof Wang Jiuhe, Kwabena Amanor Anim-Boateng, Lincoln G F Morris Jr

School of Economics and Management, Yanshan University, Qinhuangdao, 006000 China

*Correspondence Author

DOI: <https://dx.doi.org/10.47772/IJRISS.2024.804105>

Received: 01 April 2024; Accepted: 12 April 2024; Published: 11 May 2024

ABSTRACT

An efficient supply chain has been critical to the success of businesses, the maximization of profits in the service sector, and the water service authority in particular. This is to guarantee complete customer happiness for the people and the growth of the nation.

This study has focused on the assessment of different activities done as well as the better strategies and strength of the authorities towards assuring full customer satisfactions a case of Arusha Urban Water Supply and Sewerage Authority, Arusha town, Tanzania. It have addressed various issues related to the effectiveness of the water supply services by the authority to meet customer need and produce full customer satisfactions.

Based on the established objectives, which included examining the activities involved in the water services supply chain and identifying the key tactics and capabilities employed by the authority to address issues and meet customer requests, data were gathered from both the authority and customers. Various forms of surveys, interviews, documents, and observations were employed in the data collection process.

Based on the results, the researcher concluded that the authority carries out various tasks associated with water supply and that various tactics are used in day-to-day operations to ensure that customers receive effective and efficient water supply services, some of which are accompanied by strengths observed. Although the authorities have made an effort to meet the needs of the public, they have encountered obstacles and other issues. As a result, they must adapt and implement additional tactics in order to improve performance as advised.

In order to guarantee complete customer pleasure for each person's growth as well as the development of the nation, the advice went on to offer improved tactics that may be used to boost the efficacy in the performance of water supply services.

Keywords: Customer satiation, Supply chain, Water service, AUWSA,

INTRODUCTION

Information About the Authority (Auwsa)

AUWSA, Known by Arusha Urban Water Supply and Sewerage Authority, (“*Mamlaka ya Maji Safi na Taka Arusha*”) is a legally established entity responsible for the overall operation and management of water

supply and sewerage services in Arusha City.

Historical background of AUWSA

The water authority which is AUWSA was established under the Water Works Act CAP 272 and declared a fully autonomous entity by order of the Minister responsible for Water Affairs in January 1998. It was under the ministry of water and livestock development but now it works under the ministry of water. It is one of the major and important ministry that have been assuring the supply of safe, clean and fresh water to all citizens in several parts of the country for the better health and good environmental condition of the citizens. It was introduced for more than 10 years past. Since before Tanzania's citizens have been facing problems in acquiring safe and clean water as well as frequent supply of water services form industrial uses, domestics uses and other social services offers such as in schools,hospitals.Most citizens have been acquiring water from dams,streams,lakes,river which was not safe for their healthy as no any treatment was made before, but immediately after the introduction and establishment of the ministry and services offered most citizen were able to acquire safe, clean water for their healthy wellbeing.(AUWSA,2023). Arusha is supplied with water from three different sources namely springs, boreholes and a river (Nduruma). The spring sources include Olesha – Masama springs along Themu River located 4 km north of the City and Ngarendolu springs located within the City. There are 12 deep wells (boreholes) located in the northern part of the City (Arumeru district) and three boreholes located within the City area and Nduruma River in Arumeru district.

Vision Statement of the Authority

“Water Supply and Sanitation Services in Arusha City delivered in compliance with both National and International Standards”.

Mission Statement of the Authority

“To provide quality water and sanitation services efficiently and effectively using available resources and technologies for sustainable development in Arusha City”.

The Authority Motto

“Quality service delivery to our customers”

Branch networks in the city

The water supply authority offers its services in more than five city includes; Arusha Town, Simanjiro and Arumeru

Background of The Problem

Maximizing income and fostering organizational success have both benefited from an efficient supply chain. According to Christopher (2005), a supply chain is a network of businesses engaged in various processes and activities that generate value before being delivered to the final customer. These linkages might be upstream or downstream. The majority of global activities, such as industries, domestic chores, farming, and health services, rely heavily on the water services provided by the relevant authorities.

Tanzania is one of the countries in East Africa where most of the citizen depends on water to fulfil their activities such as farming, industry, health and domestic use.

The effective water supply services have been a challenge to the country to assure full customer

satisfactions. 26% of Citizens are full satisfied, 46% are partially satisfied and 28% are totally dissatisfied (Citizen Report Card on Public Services in Tanzania, Feb 2020). Due to this, more than 50% of citizens complain on the effective water supply from the authorities concerned to fulfil their requirements despite that the Government of Tanzania has embarked on a major sector reform process since 2002. An ambitious National Water Sector Development Strategy that promotes integrated water resources management and the development of urban and rural water supply were adopted in 2006 aim at assuring the effective water supply and full customer satisfaction (Water supply and sanitation in Tanzania, 2023).

Ensuring the efficient provision of water services in many sections of the country, especially Arusha city, is vital for the sustained development and enhancement of the living standards of the populace. Tanzania is divided into more than 15 regions, each of which receives water services from the relevant authority despite the fact that customers have voiced a number of complaints about the quality of the services provided, including: late delivery; poor quality of the service (unclean and contaminates water, causing water-borne diseases like cholera); late responses to their complaints; and an ineffective system for collecting bills and payments that has proven to be extremely stubborn. These issues have contributed to the above satisfaction rate. The issue has presented the ministry with difficulties as well.

As one of the legally recognized organizations in charge of the general management and operation of the city of Arusha's water supply and sewerage services, AUWSA seeks to provide high-quality water and sanitation services in an efficient and effective manner while utilizing the resources and technologies at hand to support the city's sustainable development (AUWSA, 2023). The authority has made a great effort to carry out its operations, but it has also encountered difficulties in the supply chain, just like other parts of the nation. For this reason, the researcher determined that more research was necessary in order to evaluate the efficiency of the supply chain for the customer's water supply services and the response to the customer.

Also the capacity or volume of supplying has been decreasing in relation to the demand required by citizen as due to change in weather and increase in population of Arusha as it grows at the rate of 5.4% per annum (AUWSA, 2016-2023). The authority have been producing 32,000m³/day in dry season to 60,000m³/day during the rainy season. As of March, 2017, the average daily water production has dropped from 36,000m³/day whereas the daily water demand is estimated to the tune of 53,030m³/day. So there is a wide range between the production and demand to citizen and the authority complains the problem is due to the lack of enough water sources to ensure adequate supply throughout the year including during dry seasons and unreliable electricity supply for running pumping tests within borehole sources. Despite the reasons and complains seen, the researcher still found there is a need of conducting a research, further investigation on the different activities done as well as the strength of the authority towards assuring clients satisfactions thus supplying of water services to different customers such as domestic users, health centres and industries involved to meet their needs and wants as well as offering full customer satisfactions for the company's benefits, development and further reputations. The objectives will focus on analysing this and later recommends on better strategies they can apply to further improve service offered.

Therefore the authority will have a benefit on the recommendations expected from the researcher after the assessment and further evaluation from the result as expected by the researcher.

Statement of The Problem

The effective supply of services is the key component to meet the needs and wants of customer as well as assuring full customer satisfaction for the maximization of organization profit. In many countries water have been a special and basic need for its citizen for the accomplishment of different activities includes industrial, healthy, and domestic. However the effective supply of the service has been a challenge especially in most developing countries including Tanzania. From the information, 26% of Citizens are full satisfied, 46% are partially satisfied and 28% are totally dissatisfied (Citizen Report Card on Public Services in Tanzania,

Feb2020)

In the context of the Arusha city, has experienced challenges and issues with the efficient delivery of water services in several areas, including urban districts like Njiro, Kaloleni, Mianzini, and other areas. People have been dissatisfied with the services provided in a number of areas, such as bill payment systems and water shortages (which can occur for longer than three days), which have prevented them from carrying out other crucial tasks for their homes, businesses, and other relevant organizations (health, farming). The matter at hand concerned the manner in which the authority carries out its procurement operations; specifically, is it fulfilling the demands and desires of the clientele to ensure complete contentment and preservation of its good name? Thus, the investigator investigated and continued

Aim of The Research

The study will examine on different supply chain activities done as well as the major strategies used in connections with the strength of the authority towards customer satisfactions

Research Objectives

This will involve the following objectives to be examined

- To analyse the supply chain activities of the water authority
- To examine on the significant strategies and strength used by the authority in offering their services to clients
- Future suggestions on the improvement of the services offered

LITERATURE REVIEW

Introduction

It is a critical evaluation of the writings on the subject by other authors (Jankowicz, 2005). It explains every key idea and variable associated with the research. It also offers a thorough and critical assessment of earlier studies. It serves as an overview and outline of a specific field of study, making it easy for readers to understand why you are pursuing this particular line of inquiry (Martyn Shuttleworth, 2009).

Theoretical Review

It has explained the key ideas and elements involved in the research. The review has also concentrated on other writers' theories concerning the study that was done.

Conceptual definition of terms and other related variables

This section has explained definitions of related terms as applied in the study for the generation of more understanding and knowledge to the researcher for further evaluation and data analysis.

Supply chain

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request and it does not only include the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves (Chopra and Meindl, 2004). Therefore it is the flow of different services and products from the point of supplier or manufacturer to the final destination (customer) to meet their needs and wants. It also refers to the entire system of organizations, activities, resources, and technology involved in the creation and sale of a product or service. It encompasses all the steps from the acquisition of raw materials

and components to the delivery of the final product to the end user. The supply chain typically includes suppliers, manufacturers, distributors, retailers, and customers, all of whom play a role in moving a product or service from its origin to the consumer. (Ganeshan and Harrison, 1995). A supply chain is an international network of businesses that work together to enhance the material and information flows between suppliers and customers as quickly and cheaply as possible. An efficient supply chain is critical for businesses to minimize costs, maximize efficiency, and meet customer expectations

Supply chain Management

Supply chain management is the integration of business process from the end user through original suppliers that provides products, services and information that adds value for customers, (Lambert et.al, 1998). Supply chain management (SCM) is the strategic coordination of all these activities to ensure the most effective and efficient flow of goods and services. Effective supply chain management can lead to competitive advantages such as reduced costs, improved quality, increased speed, and better customer satisfaction.

According to Johnston et.al, (2007), is the management of the relationships between businesses that are formed by links between the processes that create value for the final customer in the form of goods and services, both upstream and downstream.

Water supply service

Service is the supplying or supplier of utilities commodities or other facilities that meet a public need as water electricity communication or transportation. (Definition for service,2012). It also involves intangible products such as accounting, banking, cleaning, consultancy, education, insurance, expertise, medical treatment, or transportation.

Water supply is the continuous supply of water from the source or authority concerned to the customers to meet their needs and wants.

Water supply services are the services related to the distribution or supplying of water from the supplier to the final destination to meet the needs and wants of customers to be consumed in various sector and divisions like farming, domestic, health, industrial.

Customers

By definition, a customer is somebody that a marketer or seller is expecting to benefit to from the goods and services offered by specific organization (KnowThis.com, 1988). There are three classes of customer which are existing customer one we have at current, potential or expected customer and previous or former customer as stated. Our study focused on the existing customer of the authority.

Strategies analysis

Strategy is a method or plan chosen to bring about a desired future, such as achievement of a goal or solution to a problem.

Strategy analysis is all about the analysing the strength of businesses' position and understanding the important external factors that may influence that position (tutor2u, 2020). The process of Strategic Analysis can be assisted by a number of tools, including SWOT analysis, five forces analysis and PEST analysis.

Effectiveness

Effectiveness means how well the job gets done; how well a system achieves its intended goals. E.g.

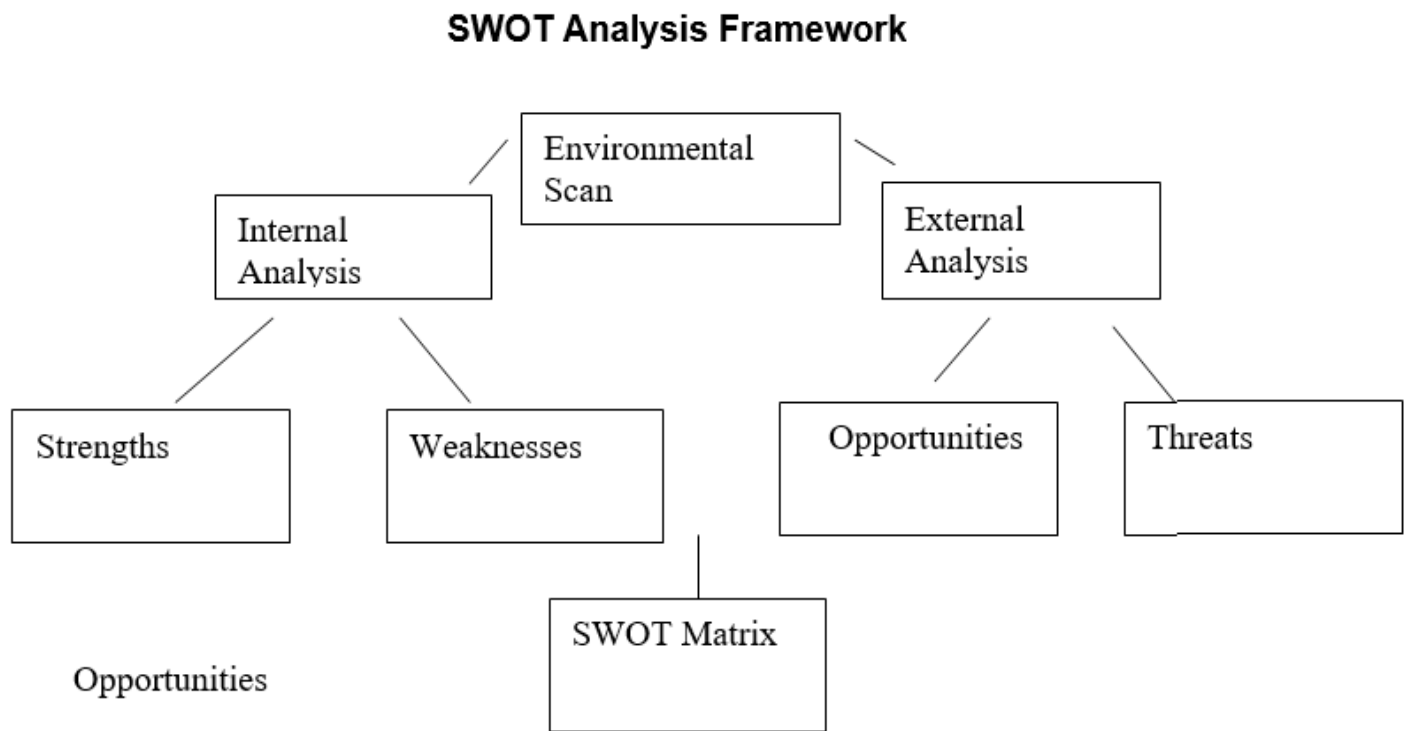
accuracy, reliability, fun, ease of use, beauty (Kelly, 2011). It is the degree to which objectives are achieved and the extent to which targeted problems are solved. In contrast to efficiency, effectiveness is determined without reference to costs and, whereas efficiency means “doing the thing right,” effectiveness means “doing the right thing.”

Swot analysis

Are the Environmental factors, internal to the firm usually can be classified as strengths (S) or weaknesses (W), and those external to the firm can be classified as opportunities (O) or threats (T) (Quick MBD, 2012). Such an analysis of the strategic environment is referred to as a **SWOT analysis**. The SWOT analysis provides information that is helpful in matching the firm’s resources and capabilities to the competitive environment in which it operates as useful summary technique for summarising the key issues arising from an assessment of a businesses “internal” position and “external” environmental influences. As such, it is instrumental in strategy formulation and selection.

The following diagram shows how a SWOT analysis fits into an environmental scan.

Fig 2.1: SWOT analysis



Source: Quick MBD, (2012).

Concepts and analytical frame works (more discussion on related study)

This section has further described and explained further terms and concepts related to the study conducted by the researcher as far as supply chain in services industry is concerned.

The overview of the Supply chain concept

As we said before **supply chain** consists of all parties involved, directly or indirectly, in fulfilling a customer request and its does not only includes the manufacturer and suppliers, but also transporters,

warehouses, retailers, and customers themselves (Chopra and Meindl, 2004). Therefore It is the flow of different services and products from the point of supplier or manufactures to the customers to meet their needs and wants.

A Supply Chain is a global network of organizations that cooperate to improve the flows of material and information between suppliers and customers at the lowest cost and the highest speed within each organization such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request. These functions included are not limited to, new product development, marketing, operations, distribution, finance and customer service (Chopra and Meindl, 2007)

Take a person entering a Wall-Mart store to buy detergent, for instance. The customer's requirement for detergent is what starts the supply chain. The Wall-Mart retail location that the consumer visits is the next link in this supply chain. Using vehicles provided by a third party, Wal-Mart uses merchandise from distributors or finished goods warehouses to fill its shelves. The manufacturer, in this example Proctor & Gamble [P & G], supplies the distributor in turn. A range of suppliers, some of whom may have sourced from lower-tier suppliers themselves, provide raw materials to the P&G manufacturing plan. For instance, Tenneco packaging may supply packaging materials, but Tenneco purchases raw ingredients from other vendors in order to produce the packaging. The accompanying picture depicts this supply chain, with the arrows indicating the direction of physical products. However, the flow of services, such water, can also be shown, as this is the case in the study.

Types of Supply Chains

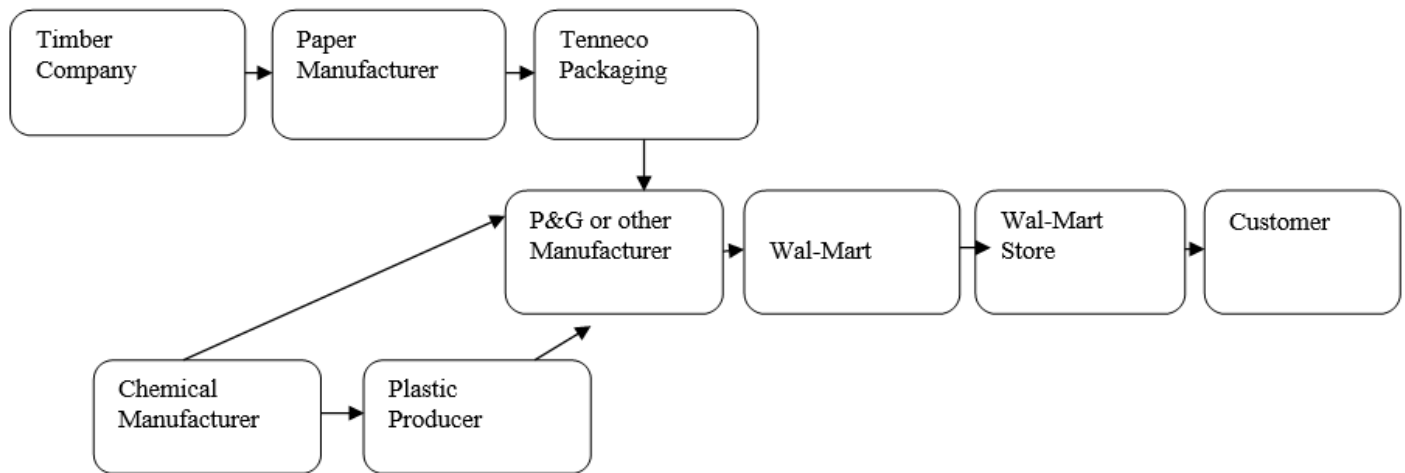
Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary significantly from industry to industry and firm to firm depending on the type of product or service and the sequence of steps in the supply chain process. Supply chains can be categorized into various structures such as pipelined structure; late customization; divergent structure; and convergent structure (Biswas, 2000). Each type of supply chain has its own unique characteristics, challenges, and strategies for optimization. The choice of supply chain type depends on factors such as the nature of the product, market conditions, customer expectations, and the capabilities of the organization.

- **Direct Supply Chain:** In a direct supply chain, the product moves directly from the producer to the consumer without passing through any intermediaries. This is common in industries such as agriculture, where fresh produce is sold directly to consumers at farmers' markets or through community-supported agriculture (CSA) programs.
- **Indirect Supply Chain:** An indirect supply chain involves one or more intermediaries between the producer and the consumer. These intermediaries can include wholesalers, distributors, and retailers. This type of supply chain is typical in retail, where products are sold through stores or online platforms.
- **Reverse Supply Chain:** A reverse supply chain is the opposite of a traditional supply chain. It involves the movement of goods from the consumer back to the producer or another entity.
- **Standard Supply Chain:** This is a typical supply chain that moves goods from the producer to the consumer. It includes all the standard stages such as sourcing, production, inventory management, and distribution.
- **Dynamic Supply Chain:** A dynamic supply chain is one that is highly adaptable and can quickly respond to changes in demand, supply, or market conditions. This type of supply chain often uses advanced technologies and analytics to predict and react to changes.
- **Agile Supply Chain:** An agile supply chain is focused on rapid response and flexibility. It is designed to quickly adapt to changes in demand and supply, optimize inventory levels, and minimize lead times.
- **Virtual Supply Chain:** A virtual supply chain involves the use of digital platforms and technologies to manage and coordinate the flow of goods and information. It may not require physical inventory or

storage and is often used for digital products or services.

- **Global Supply Chain:** A global supply chain spans multiple countries and regions, often involving the sourcing of raw materials and components from different parts of the world, production in one or more countries, and distribution to markets worldwide.
- **B2B Supply Chain:** A B2B (business-to-business) supply chain is focused on the sale of products and services between businesses. It is common in industries such as manufacturing, where raw materials and components are supplied to other companies.
- **B2C Supply Chain:** A B2C (business-to-consumer) supply chain is designed for the sale of products and services directly to consumers. This is typical in retail and e-commerce, where businesses sell products to individual consumers.

Figure 2.2: Example of supply chain



Source: Chopra and meindl, (2007)

A supply chain is a dynamic and involves the constant flow of information, products and funds between different stages. In our example, Wal-Mart provides the products, as well as pricing and availability information, to the customer. The customer transfers funds to Wall-Mart. Wal –Mart conveys point of sales data as well as replenishment orders to the warehouse or distributor, who transfers the replenishment order via trucks back to the store. Wal-Mart transfers funds to the distributor after the replenishment. The distributor also provides pricing information and sends delivery schedule to Wal-Mart may send back package materials to be recycled. Similar information, material and fund flows take place across the entire supply chain. The above example have been described by Chopra and Meindl (2007), it illustrate customer as an integral of the supply chain.

Process and other Stages in the Supply chain

The primary purpose of ay supply chain is to satisfy customer needs and wants, in the process, generate profit for itself. It conjures up images of products or supply moving from suppliers to manufacturer to distributors to retailers to customers along chain (Chopra and Meindl, 2007).

It involves the flow of information, funds, services as well as products in both directions of the chain thus a sequence of processes and flows that take place within and between different stages.

The supply chain process/stages involved are divided into two main different ways performed as follows:

- **Cycle view**
- **Push/pull view**

Cycle view of supply chain processes

The process in a supply chain is divided into a series of cycles, each performed at the interface between two successive stages of a supply chain (Chopra and Meindl, 2007).

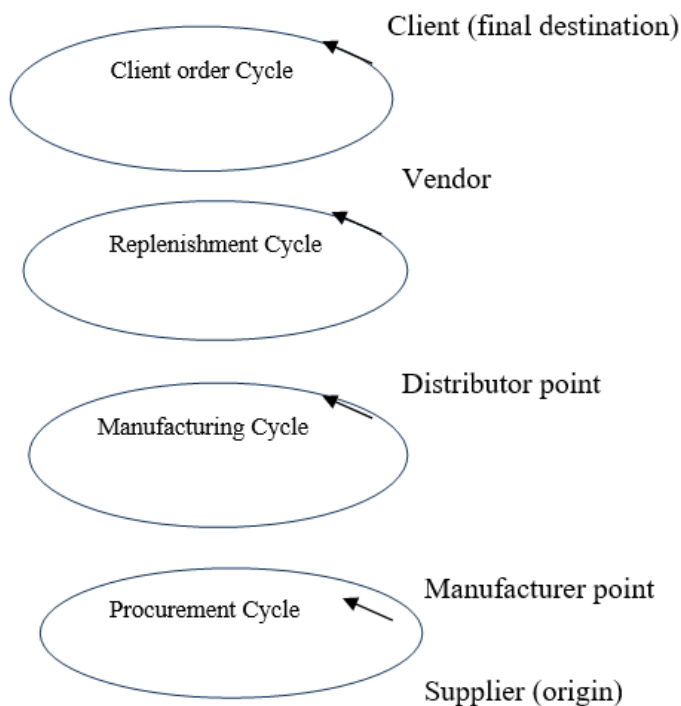
A typical supply chain may involve four main process cycles with five stages as follows:-

- Customer (customer order cycle)
- Retailers (Replenishment cycle)
- Wholesalers/distributors
- Manufactures (Manufacturing cycle)
- Component/raw materials suppliers (Procurement cycle)

Every cycle takes place at the meeting point of two successive supply chain phases. Four cycles of the supply chain process are thus produced by the five steps. Not every supply chain will have all four cycles properly divided, according to Chopra and Meindl (2007). All four cycles, for instance, are probably segregated in a supermarket supply chain where a merchant maintains finished-goods inventories and places replenishment orders with a distributor. Dell, on the other hand, bypasses the distributor and merchant and sells straight to consumers.

The following figures 2.3 and 2.4 describe the above process cycles and stages of the supply chain:-

Figure 2.3: Process cycle and Stages of the supply chains Source



Source: Chopra and Meindl, (2007)

Importance and objectives of the supply chain

The objective of every supply chain is to maximize the overall value generated (Chopra and Meindl, 2004). The value a supply chain generates is the difference between what the final product is worth to the customer and the effort the supply chain expends in filling the customer's request.

Customer satisfaction is the global goal of a supply chain. Individual supply chain components, on the other hand, strive to maximize their shareholder value by optimizing the Return on Investment (ROI) of their investors. ROI, or return on investment, measures a company's profit over a whole year (Jean-Marie PROTH, 2012). Additionally, he clarified the following tactical goals of the supply chain as follows:-

- It reduces the time needed to convert order into cash
- It reduce the total Work-In-Process (WIP) in the Supply Chain.
- Improving pipeline visibility, that is the visibility of each one of the activities of the Supply Chain by each one of the partners.
- Improving visibility of demand by each one of the partners.
- It improves the product or service quality.
- Minimizing the running costs.
- Service improvements

Strategies in the supply chain

There's some truth to this definition, but supply chain strategy really is broader; it defines how the supply chain should operate in order to compete. Supply chain strategy is an iterative process that evaluates the cost benefit trade-offs of operational components (UPS Supply Chain Solutions, 2005). The supply chain strategy constitutes the actual operations of that organization and the extended supply chain to meet a specific supply chain objective.

Developing a Supply Chain Strategy

There are several steps involved in the developing of the Supply Chain Strategy as said by UPS Supply Chain Solutions, (2005) .These are;-

- **Understand the Business Strategy**

The first step is for supply chain executives to clearly understand how the enterprise chooses to compete. This is important not only for the obvious reason of working off the “same play book,” but also for the reason that it forces the supply chain operation to see itself as a customer facing entity serving the competitive goals of the enterprise—not merely an operational department

- **Assess the Extended Supply Chain**

The next step is to conduct a detailed, realistic assessment of the capabilities that exist within the organization and even the extended supply chain. Begin by closely scrutinizing your organization's assets and evaluate how well they support the strategy. A formal supply chain assessment by a non-biased outside party may assist you in better understanding your operational strengths and opportunities for improvement. Look for a firm that can provide you with operational benchmarks both inside and outside of your industry in order to gauge core competencies. Once the assessment is complete, assemble a team to review and prioritize recommendations, validate the opportunities, define the risks, and the requirements for implementation. Ultimately, if there is a disparity between the supply chain strategy and the operational assets, you may have to make capital investments.

- **Develop an Implementation Plan**

There is a need of having a good plan for the further implementation of the activities and strategies selected to achieve the intended goal as far as supply chain is concerned.

Factors affecting or challenges in the supply chain activities

There are various challenges facing the supply chain activities. They have been described by different authors.

The following are the challenges of supply chains as obtained from IBM Global Technology Services, (2007).

- Time, language and cultural differences within the supply chain
- Legislative differences, e.g. data protection act and safe harbour, employment law, tax regime
- Longer and more complex supply chains
- Transport, infrastructure and communications
- Longer and less reliable lead times when sourcing from the Far East
- More demand for greater product variety with stocking of each variant
- Contrary pressures of lower stock holding costs versus high customer service
- Shorter product life cycles
- Skills – where do our starter jobs come from?

Drivers of supply chain performance

The company's supply chain performance requires achieving the balance between responsiveness and efficiency that best meets the needs of the company's competitive strategy for the customer satisfaction and sustainable development. To understand how the company can improve supply chain performance in terms of responsiveness and efficiency, we must examine the cross functional drivers of supply chain performances which are; facilities, inventory, transportation, information, sourcing and pricing are explained as follows (Chopra and Meindl, 2007).

- **Facilities** are the actual physical locations in the supply chain network where product is stored, assembled, or fabricated. It involves the production sited and storage sites which are very important to customers' satisfaction. Example; the near the storage sites to customer the better the performance as well as the more efficiency the production sites the better the performance and more profitable.
- **Inventory**, encompasses all raw materials, work in process and finished goods within a supply chain. Changing the inventory policies can dramatically alter the supply chain efficiency and responsiveness, thus inventory should be well treated as one of the important driver in assuring good supply chain performance as concerned.
- **Transportation** entails moving inventory, services from one point to another point in the supply chain. Transportation choices have a large impact on supply chain responsiveness and efficiency to maximize total supply chain profitability. For example the company can use the fastest mode of transport but at high cost or it can suggest using the slower mode of transport but at affordable cost and cheaper which results to the maximization of the profitability in the supply chain.
- **Information** consists of data and analysis concerning facilities, inventory, transportation, costs, prices and customers through out the supply chain. It is potentially the biggest driver of performance in the supply chain because it directly affects each other drivers, thus marking the supply chain more responsive and efficient.

Chopra and Meindl, (2007) also said that, information is the key supply chain driver because it serves as the glue that allows the other supply chain drivers to work together with the goal of creating an integrated, coordinated supply chain. It is the crucial to supply chain performance because it provides the foundation on which supply chain processes execute transactions and managers make decisions. Without information, a manager cannot know what customers wants, how much inventory is in stock, the service required.

Therefore information makes the supply chain visible to a manager to improve supply chain performance. Information should have the following characteristics to be useful when making supply chain decisions; it should be accurate giving out the truth picture of the state of the supply chain, it should be accessible in a timely manner and it should be of the right kind, thus it can be used in decisions and other performance.

- **Sourcing** is the choice of who will perform a particular supply chain activity such as production, storage, supplying, transportation, or the management of information. Sourcing decisions will affect both the responsiveness and efficiency of a supply chain. For example, after Motorola outsourced much of its production to contract manufacturers in China, it saw its efficiency improve but its responsiveness suffer because of the long distance. Also during sourcing you need also to consider the benefits in relation to the costs that will be incurred.
- **Pricing**, determines how much the firm will charge for goods and services that it makes available in the supply chain. Pricing affect the behaviour of the buyer of the good or services, thus affecting the supply chain performance. For example, if a transportation company varies its charges based on the lead time provided by the customers, it is very likely that customers who value efficiency will order early and customers who value responsiveness will ne willing to wait and order just before they need a product transported. Early orders are less likely if prices do not vary with lead time.

Performance evaluation of the supply chain

It is believed that, a well crafted system of supply chain metrics can increase the chances for success by aligning processes across multiple firms targeting the most profitable marketing segments and obtaining competitive advantages through differentiated services and lower costs. The lack of proper metrics for supply chain will result in failure to meet customer expectations, poor performance and conflicts in the supply chain. Managers need to see the areas where the supply chain performance can be improved so that they can focus their attention and obtain high level of performance (Lambert and Pohlen, 2006).

Coordination in the supply chain

Supply chain coordination improves if all stages of the chain take actions that together increases total supply chain profits. It requires each stage of the supply chain to take into account the impact its actions have on other stages (Chopra and Meindl, 2007). The authors say, lack of coordination occurs either because different stages is delayed and distorted, thus different stages of a supply chain may have conflicting objectives if each stage has a different owner where by each stage will maximize its own profits, resulting inactions that often diminish total supply chain profits.

Effects on performance of lack of coordination

A supply chain lacks coordination if each stage optimizes only its local objectives as said before by Chopra and Meindl, (2007). Each stage of the supply chain in trying to optimize its local objective; takes actions that end up hurting the performance of the entire supply chain and results to the decreasing of the supply chain profitability this may be due to the results if information (as one of the main driver) distortions occurs within supply chain.

The following are some effects of lack of coordination in the supply chain by Chopra and Meindl (2007).

- Manufacturing costs will increase
- Inventory cots will also increase
- Increase replenishment lead time
- Increase in the transportation cost
- Labour costs for shipping and receiving will increase

- The level of product availability will decrease
- The relationship across different stages in the supply chain will be destroyed

Overview of the Supply chain management

The Supply Chain Management is a wider concept than Logistics thus the management of up streams and downstream relationship with suppliers and customers to deliver superior customer value at less cost to the supply chain as whole achieving more profitable outcome for all parties in the chain (Christopher, 2005). He said whilst the phrase 'SCM' is now widely used, it could be argued that it should really be termed '*demand chain management*' to reflect the fact that the chain should be driven by the market, not by suppliers. Equally the word 'chain' should be replaced by 'network' since there will normally be multiple suppliers and, indeed, suppliers to suppliers as well as multiple customers and customers' customers to be included in the total system.

Supply chain management practices

Li et al., (2005) and Li et al., (2006) define SCM practices as a set of activities conducted by organisations to promote an efficient management of their supply chain. According to Pires (2004), SCM practices are related to initiatives for changing the management of business processes in the supply chain. Also Vaart and Donk (2008) state that supply chain practices are considered tangible activities or technologies that play an important role in focal company collaboration with its suppliers and customers.

Also SCM is the design, maintenance and operation of supply chain processes for satisfaction of end users (Christopher, 2002). It involves, planning, organizing, execution, control and monitoring of Supply chain activities with the objectives of creating net value, building a competitive infrastructure, leveraging world wide logistics. synchronizing supply with demand and measuring performance globally.

Therefore SCM is all about having the right product or service in the right place, at the right price, at the right time and in the right condition to the expected customers as required.

The following are the importance of the Supply Chain management in the business operations in regard to service industries for the proper performance and increase in competitive advantages in the competitive market and sustainable growth of the company's:-

• Reducing costs

Supply Chain Management will enable the company to reduce the cost of performance, for example; the company will be able to select the appropriate means of transporting products at reasonable price/cost, also goods will be well managed from the point of supplier to the end-users avoiding other additional costs concerning damages and also proper inventory managing thus results to the reduction of the inventory holding costs. The results will be the increasing the profits margins (Johnston, 2007).

• Quality control

The supply chain management will enable the company to assure the proper quality of different products as well as services are delivered to the end users by managing the means of transport used, ways, and other distribution strategies to avoid negative results like damages, theft, testing of the products before they reach to the required destination. All these will protect the product quality as targeted by the company and finally produces full customer satisfaction for the gaining of more competitive advantage in the market place (Christopher, 2002).

- **Speed**

This has two meanings in a supply chain context as said by Johnston, (2007).

First is how customer can be served as well as respond to the requirements such as the orders made. The management should know that it is an important element in any business ability to compete. However fast customer response can be achieved simply by over-resourcing or overstocking within the supply chain. For example very large stocks in a retail operation can reduce the chances of stock out to almost zero, so reducing customer waiting time virtually to zero.

Second, Speed is the time taken for goods and services to move through the chain. So the supply chain management will ensure quick and proper movement of materials as well as products. For example, products that move quickly down a supply chain from raw material suppliers through to retailers will spend little time as inventory because to achieve fast throughput time, material cannot dwell for significant periods as inventory which results to the reduction of the working capital requirements and other inventory costs in the supply chain of the company.

Factors affecting SCM and Solutions as recommended by other authors

- **Customer service**

Effective supply chain management is all about delivering the right product in the right quantity and in the right condition with the right documentation to the right place at the right time at the right price. If only it were as simple as it sounds (Chopra and Meindl, 2007).

- **Cost control**

Supply chain operating costs are under pressure today from rising freight prices, more global customers, technology upgrades, rising labour rates, expanding healthcare costs, new regulatory demands and rising commodity prices. To control such costs there are thousands of potential metrics that supply chain organizations can and do measure. Managers need to zero in on the critical few that drive total supply chain costs within their organizations (Johnston, 2007).

- **Planning and Risk Management**

Supply chains in time to time must be assessed and reshaped in response to market variations, including new product launches, global sourcing, new acquisitions, credit availability, the need to protect intellectual property, and the ability to maintain asset and shipment security. In addition, supply chain risks must be identified and quantified. SCC members report that less than half of their organizations have metrics and procedures for assessing, controlling, and mitigating such risks (Christopher, 2005).

- **Supplier or partner relationship management**

Performance expectations and results can be measured and communicated differently in different organizations, or even within the same department. Trust begins when managers let go of internal biases and make a conscious choice to follow mutually agreed upon standards to better understand current performance and opportunities for improvement (Murray, 2012).

- **Talent**

As experienced supply chain managers retire, and organizations scale up to meet growing demand in

developing markets, talent acquisition, training, and development is becoming increasingly important. Supply chain leaders need a thorough understanding of the key competencies required for supply chain management roles, specific job qualifications, methods for developing future talent and leaders, and the ability to efficiently source specific skill sets (Chopra and Meindl, 2004).

Performance evaluation of SCM

Managers need to see the areas where the supply chain performance can be improved so that they can focus their attention and obtain high level of performance (Lambert and Pohlen, 2006). The measurement have been described in the frame work under several steps as follow;-

- **Developing profits and loss statements,**

It involved the development of the customer and supplier P&L statements that will show the relationship of the amount earned and spent. It provides a clear picture on the relationships on how profitability is and affects the performance in the supply chain.

- **Realign Supply Chain Management Processes**

The P&L statements developed will provide the measure of supply chain management performance and can be used to align performance across processes and firms. The supplier's P&L reflects the resulting total cost as well as changes in assets (because of charges for assets employed), revenue and profitability.

Empirical Studies

The proper supply chain of services in services industries have been so important for the development of the industry or respective organization. It have contributed in the maximization of profits and further increase of production. Also there have been great needs for the proper management of the supply network as concerned.

There have been various studies conducted by several individuals worldwide assessing and exploring the effectiveness as well as performance of the supply chain in the service industry for the customer satisfaction and development of the industry.

The following are the empirical studies done by different researcher in related to the study:

Abdulhussein, (2011) in his study of analyzing the factors hinders supply chain activities he concluded that, the effective management of supply chain is not an easy task even in developed countries and when coming to developing countries like Tanzania, supply chain would be very challenging tasks so there is a need to develop effective strategies in dealing with the ground reality problems to increase the efficient of supply chains in Tanzania.

Dahlberg Global Development Advisors and the MIT-Zaragoza International Logistics Program, (2008) in production of the joint research paper a study carried out at with the title, The Private Sector's Role in Health Supply Chains: Review of the Role and Potential for Private Sector Engagement in Developing Country Health Supply Chains a case of Ghana and Zambia. They concluded that, the use of private sector supply chain services is increasing slowly in African countries like Ghana, Zambia, with best practices coming into the public sector, either through direct implementation by consultants to the public sector or through outsourcing of supply chain services to providers who have implemented private sector best practices. Therefore there is a need for the respective government to support the private sectors in improving the supply chains for services to provide customer satisfaction, saves life and further country's development.

Elsevier, (2003) of USA, in conducting his research with title of supply chain performance measurement Said that, there should be clearly effort focused on carefully managing supply chains for the increase of revenue, thus financial benefits for participating firms as far as supply chain in service industry is concerned. The proactive approach to SCM is advisable for firms wanting to enhance competitiveness. He said that, the effective SCM help to win customers and improve customer service. This is why we believe it is important to assess performance in SCM and the reason they developed the SCM performance measurement framework as the means of developing more strategies for effective performance.

According to BM Corporation's (2008) research on supply chain risk management in the United States, the supply chain is becoming more complex and global, posing additional risks and problems. Consumer needs are always evolving, and new market penetration frequently necessitates a totally new strategy for product and service segmentation as well as consideration of related governmental, cultural, and environmental factors. He persisted in emphasizing the importance of risk management in supply chain operations by outlining several advantages for management in terms of foreseeing and developing better ways to mitigate risks that are anticipated to arise inside a certain company. The benefits include shorter recuperation times, fewer interruptions, and the reduction of unforeseen and possible expenses. As a result, keeping an eye on possible, predictable, and even uncertain risk elements while monitoring and managing supply chain events typically results in evidence of an improvement in overall supply chain performance, which is required for the growth of the industry and the maximization of profit when it comes to service supply.

Jacob, (2008) of Malaysia in his research of exploring the Impact of Supply Chain Practices on Competitive Position of Manufacturing industries in Malaysia, he said that most industries and other companies have not realized the full potential of efficient Supply chain management, Even the companies that practice SCM, do not use advanced ideas like supply chain teams, EDI, information sharing and others. The effects of globalization have changed the expectation level of the customers. Many of the factors like quality that were considered as "order winners" a decade ago are no longer winners but only qualifiers. The customers expect more at reduced cost. A sure way to cut costs and improve service is by having effective and efficient SCM. Therefore there is a great need for both service and manufacturing industries to have clearly view and managing the activities involved in the supply chain by having good SCM for the efficient and effective performance.

RESEARCH DESIGN AND METHODOLOGY

Introduction

The study involved both primary and secondary data where the researcher had several ways to collect data like interview, questionnaires and observations to assure enough information was taken and recorded.

Data Acquisition

The study included different staffs of AUWSA. The staffs were mainly those from the management, operations and technical and sales/bills payments. Also selected customers were involved in the data acquisition for the collection of the appropriate information required based on the study and objectives concerned.

Research Techniques

Both the Qualitative and Quantitative techniques were involved

Quantitative data is predominantly used as a synonym for any data collection technique (such as a

questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data (Saunders et al, 2009). **Qualitative data** predominantly used as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorising data) that generates or uses non-numerical data, it refers to data other than words, such as picture and video clips (Saunders et al, 2009). The qualitative provided detailed information about the problem as they were more realistic because of their exhaustive and holistic in nature-multiple realities. The Quantitative based on numerical and standardization measurement.

Sampling Technique

The following are the sample technique used in the study:

Purposive sampling

It involves choosing people whose views are relevant to an issue because you make a judgement and or your collaborators persuade you, that their views are particularly worth obtaining and typify important varieties of view point as far as our study is concerned (Jankowicz, 2005)

Sample size

It involves selecting samples of different number depends on the need of the respective data as required. In finding the sample size for data acquisition, the study approached only those individuals capable of providing relevant information on activities involved in the supplying of water services. In doing so, a list of staffs and customers as concerned were compiled. The criteria used to come up with the staffs and customers who can participate in the study were:

- Capability of providing information on various activities involved in the supply of water services to customers.
- How positive they were ready, familiarity of staff and customers. This was achieved by first talking and asking them if they could participate in the study by sparing their time in sharing together and giving out information as required.

The sample selected for the data collection are described in the table 3.1 and table 3.2 below:

Table 3.1: Sample size analysis in questionnaire response from the study conducted

AUWSA		
Group	Issued	Returned
Administration staffs	2	1
Sales (Bill payments) staffs	2	1
Customers	30	26
Technical (engineering) Staffs	2	1
ICT (information and communication), reception staffs	2	1
Total	38	30
% of response	100%	79%

Table 3.2: Sample size analysis in interview attendance from the study conducted

AUWSA		
Group	Invited in the interview	attended

Administration staff	2	1
Sales (Bill payments) staffs	–	–
Customers	20	12
Technical (engineering) Supplying	1	1
ICT (information and communication), reception staffs	–	–
Total	23	14
% of response	100%	61%

Source: Findings and results obtained from AUWSA and customers, (2023)

Treatment of Data

Upon conducting a thorough analysis of the research data, the initial questionnaire results were categorized into several groups, such as customers and personnel. Every organization supplied the necessary information. To do this, one variable at a time was taken into account. Excel and other Microsoft Office products were used for the questionnaire analysis. After that, a qualitative analysis of the documents, observations, and interviews was conducted to determine how well they corroborated the survey results.

Data Reliability and Validity

The researcher investigated a number of sources, including documents, citations from numerous publications, websites, and visuals and observations, as proof for the information provided or documented. In order to ensure that data are handled appropriately and that accurate information is obtained, the researcher also employed a number of programs, including Microsoft Office Word and Excel as well as the SPSS package, which set and imposed a number of formulas connected to the study’s data. Additional techniques used included proofreading, checking for consistency, allowing characters, checking for range (months should fall between 1 and 12), and checking for spelling and grammar.

Research Ethics

The researcher formally requested authorization from the management to obtain data from the many departments engaged in the study area and to gather pertinent data for the issue in an official letter. The management gave their approval and consented to the authority’s conducting research by gathering the necessary data in accordance with the goals. Most society depends on data obtained through research as far as modern technology and globalization is concerned, and our daily lives intertwined with decisions and acts that are based directly or indirectly on information compiled from research data (Shamoo and Dunigan,2000).The study was conducted in an appropriate manner that respects the privacy and freedom of the respondent. In addition, the author obtains informed permission of the respondents who participated in answering questionnaire and interview, also the author managed to avoid some things that may oppose the lawful interest of the respondents. Confidentiality was assured to respondents and their names were not revealed in the study instead remained anonymous. Respondents were supposed to fill and give information willingly without any force or strictly rules applied.

RESEARCH FINDINGS AND DISCUSSION

This findings and discussion of the data gathered in order to address issues related to the study as follows:-

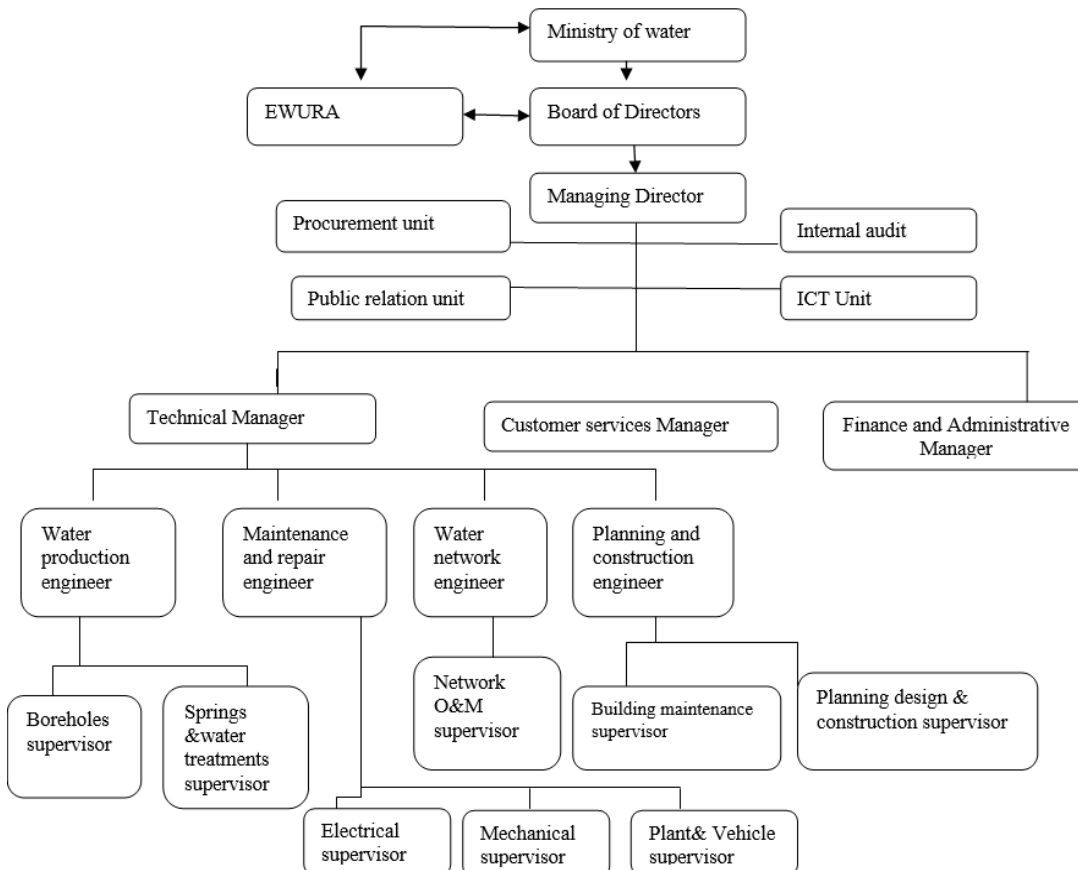
The activities involved in the supply chain of water services

In order to understand and know various activities involved in the supply chain of water, personal interviews

and other questionnaires were performed and given to the administrative staff officer, one engineering staff at the technical office and sales and bill payment staff. The activities involved in the water supply services were divided and performed by other staffs and specialists involved. The management said that the Authority has a total of 181 employees working and more than 50 employees are concerned in the water supply service for the customer satisfactions and the work is well performed by each employee.

The chart below describes the organization chart of AUWSA showing different departments responsible for the water supply services.

Figure 4.1: Shows the AUWSA organization chart



Source: AUWSA documents, (2023).

The following are other activities involved in the water supply as responded and performed by the departments concerned:-

- New water connections services from the authority to different customers at the costs fixed by the authority
- Alert customers on their bills and collecting them from the authority offices selected (bills payments office) where by each customer is supposed to come and pay after being informed through the postal address or other means like; vehicle public announcements
- Solving customers complains and other problems such as bills problems(overcharges), pipe cut
- Reconnections and fixing of lick ages to customers
- Production and further treatments of water from the authority water sources (boreholes rivers and springs) for the proper health of customers as concerned
- Maintenance and repair of AUWSA infrastructure involves water sources, supply pipes, generators involved in pumping water to customers, electrical connections involved in the supply system

Also, the researcher had a time for the short observation on 8th for 1.30 hours and 9th August, 2023 for 2 hours observing how different activities AUWSA is conducting as far as water supply service is concerned. The researcher found other activities such as; water connection pipes at the urban areas along side the main road to Njiro and near by AUWSA on the way to Dar-express stand. The technical staffs were shifting, repairing and connecting the main pipes due to the road construction taking place. Further more the researcher had a good time observing the way customer were paying their bills, complaining on their bills, complaining on the shortage of water. Not only that also the researcher had observed the way AUWSA staffs are collecting bills from customers, recording data, collecting and packing pipes and other equipments to different AUWSA vehicles from AUWSA to the sites. So these were some activities the researcher observed for the two days mentioned above.

The major strategies and strength used by the authority to meet customers' needs and solve other problems

The researcher developed several questionnaires and interview questions which enabled to obtain the required information on the objective concerned and the respond was 100% that AUWSA has its strategies and strengths as the tool for the efficiency and effective performance.

The following were the results and other findings obtained from the departments as involved in exploring the major strategies and strength used by AUWSA to meet customers' needs and solve other problems as far as water supply services is concerned:-

- AUWSA has developed a special program and unit of solving customer complaints and other problems by having the public relations unit and customer service section intentionally for informing and responding quickly to customer through mobile phones, emails and direct delivery notes by their staffs. Also through direct conversations by the customer if required
- Good location, accessibility of the authority which favours customers to reach easily direct to the offices to get services. Also due to lack of competitors as a respond from the administration, it has managed to develop and increase more revenue due to the reason of having a good number of customer depending on the service provided which has enabled the authority to develop.
- Furthermore AUWSA has a system of outsourcing skills, employees and other special equipments which increases efficiency and effectiveness in the performance assuring customer satisfactions. Different employees from outside the country can be consulted and requested to come and introduce either a new program of operation and train the employees and he/she will be paid as agreed. This has enhanced creativity and innovation in the authority.
- Also the authority has a system of assuring all employees are informed and updated for any special or urgent event required through the use of outlook and emails, land line phones which are internal line connected in each office (departments). This also included the self-client service and automatically reply to some inquiries through the use of different apps in individual clients phones where he/she can access at anytime, anywhere been without visiting the offices.
- The presence of good and enough equipment required in the water supply such as heavy water machines pump generators despite it depends on the presence of electricity as most use electricity, special meter reading machines (which reduces errors in recording water bills results to reducing customer complains) , standby mobile bikes and vehicles and vehicles for staffs and other important equipment required. It has been strength to the authority for the assurance of better performance and increase employee morale in performance.
- Also AUWSA uses experts who are skilled and experienced in the related fields in order to assure better services to customers.
- The use of full cost recovery method thus the expenditure is due to the earnings which help the authority to operate at less cost and increase more profit

- Also the authority has a special program of capturing and recording all customer bills as collected by the experts and later before payments they are sent to individual phone for approval then after payments every customer will be provided with a special copy (through SMS) showing all the payments made as an evidence for any problem that will occur. This have helped and supported the authority to solve various problems concerning customers' water bills.
- Pre -informing customers in case there is any water shortage in days to come through individual phone, Medias or public announcement so that they can be prepared to reduce future complaints on water shortage.

Therefore the above statements are the strength and other strategies used as explored by the researcher which enabled AUWSA to perform its activities vey well in assuring customer satisfactions as far as the water supply service is concerned.

Also from the AUWSA (2011-2016) documents as the mod term strategic plan the former Arusha Municipality obtained City status from July, 2010. On this basis, Arusha City has increased AUWSA's area of jurisdiction from 93km² to 208km² more than double the original service area. The Authority is therefore forced to review its plans and strategies to accommodate these changes. The specific actions will be to: – Improve existing water sources; develop new water sources; prepare plans for future water supply; expand the water distribution network; maintain international water quality standards; reduce NRW while improving billing efficiency, and develop and implement a maintenance plan.

Therefore the authority expects more improvements, good outputs for the coming period and all the outputs will be measured by various indicators such as; Ratio of production against demand (%); Quality of water produced against Tanzanian Standards; Average hours of water supply; Service coverage, and Non-Revenue Water.

The Critical Issues involved in related to the study as the future plan by AUWSA

A variety of important issues were raised during the review of our recent initiatives, our Stakeholder analysis, self assessment and trend analysis. These issues were synthesized to create a list of strategic issues as follows:

- How should AUWSA increase revenue collection (generally) and specifically, continue to improve the billing system while sustaining universal metering and move towards full cost recovery.
- As competition for skilled and qualified staff increases, how can the authority attract and retain staff as well as solve the problem of the labour turnover. Specifically AUWSA aims at performing the following;-Proactively conduct capacity building programmes, continuously equip our staff with modern tools, provide them with adequate working space and constantly review staff remuneration packages while involving and empowering them, and
- How the authority would streamline our organizational structure, outsource non-core activities, design and implement other cost reduction measures in order to achieve Authority's ultimate goal of improving service delivery efficiency.
- How to increase water production to meet demand from the previous 53,030m³/d to 75,000m³/d for the new service area. Specifically what should the authority do to; develop new water sources – surface, ground water and rain water harvesting and expand the distribution network while putting into consideration environmental conservation measures.
- While increasing production the authority plans to expand the current distribution network (248.88km), maintain the existing network and achieve 75% water supply coverage from the present 44% and supply water for 24 hours.
- What measures should AUWSA institute to reduce Non Revenue Water (NRW)
- How can we utilize modern technology in digitizing our water and sewerage distribution network and

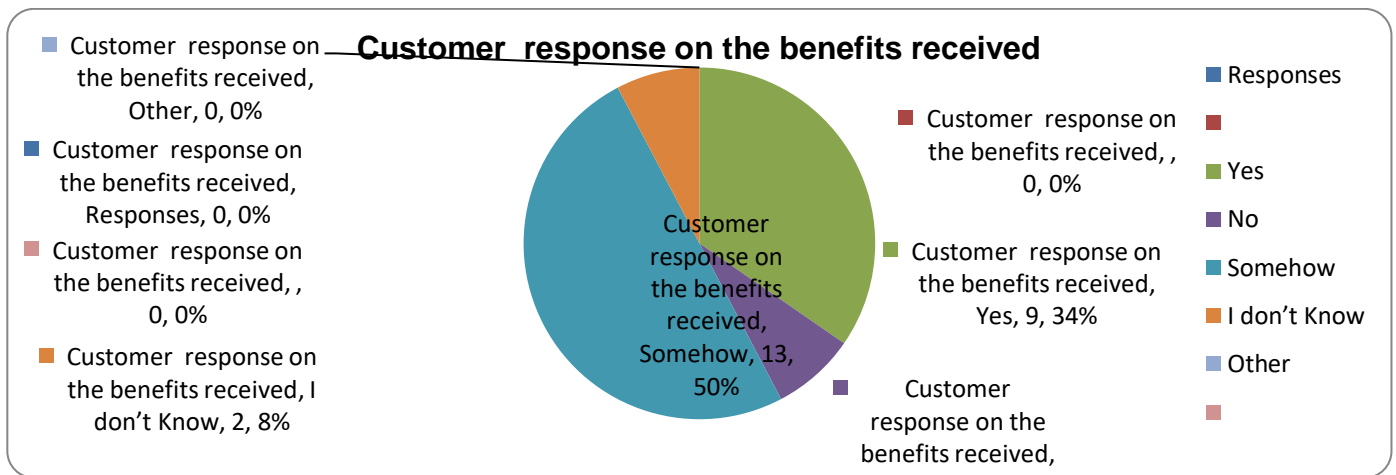
keep customers’ records on digitized maps, increasing billing and revenue efficiency, water point mapping and finally but by no means less important, how should we continue building strategic alliances with partners and stakeholders

The benefits received by customers from the service offered by AUWSA

Respond towards whether customers have received benefits and the specific benefits obtained are further described with diagrams and small explanations based in the following questions as asked to different customers after filling the questionnaires and attending interview

• **Response towards benefits received from the authority**

Figure 4.2: Describe the percentage of customer response towards receiving the Benefits from AUWSA

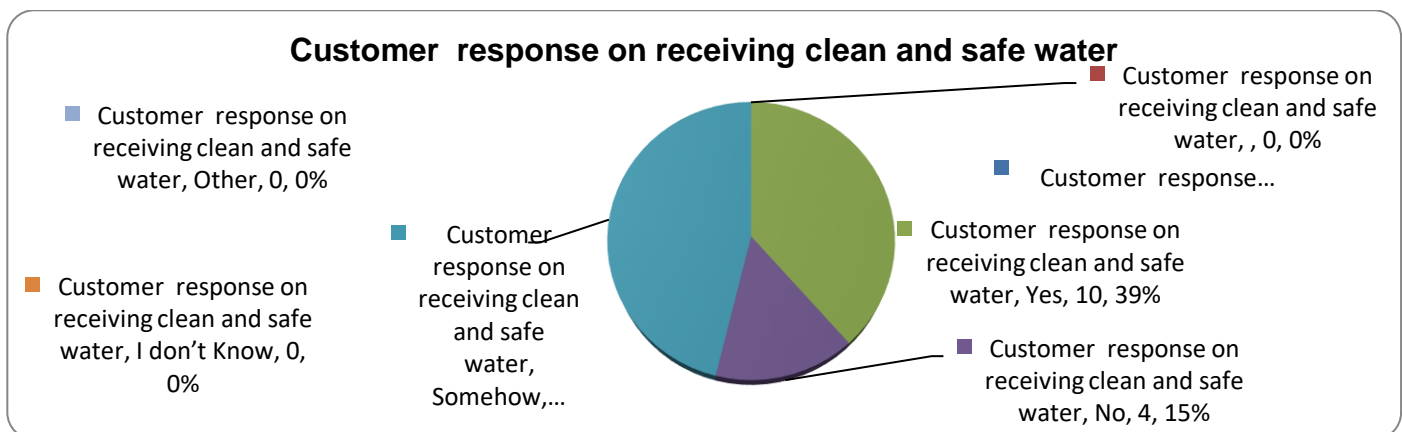


Source: From the findings obtained from respondents, (2023)

When all customers completed the surveys, 26.50% of them claimed to have benefited in some way from the authority’s provision of water supply services.34% of customers said they had received advantages without any issues or reservations.8% of consumers claimed they were unaware of them, while 8% stated they had not yet gotten any benefits.

• **Response towards receiving clean and safe water, the respond was as follow in figure 4.3**

Figure 4.3: Describe the response towards receiving clean and safe water

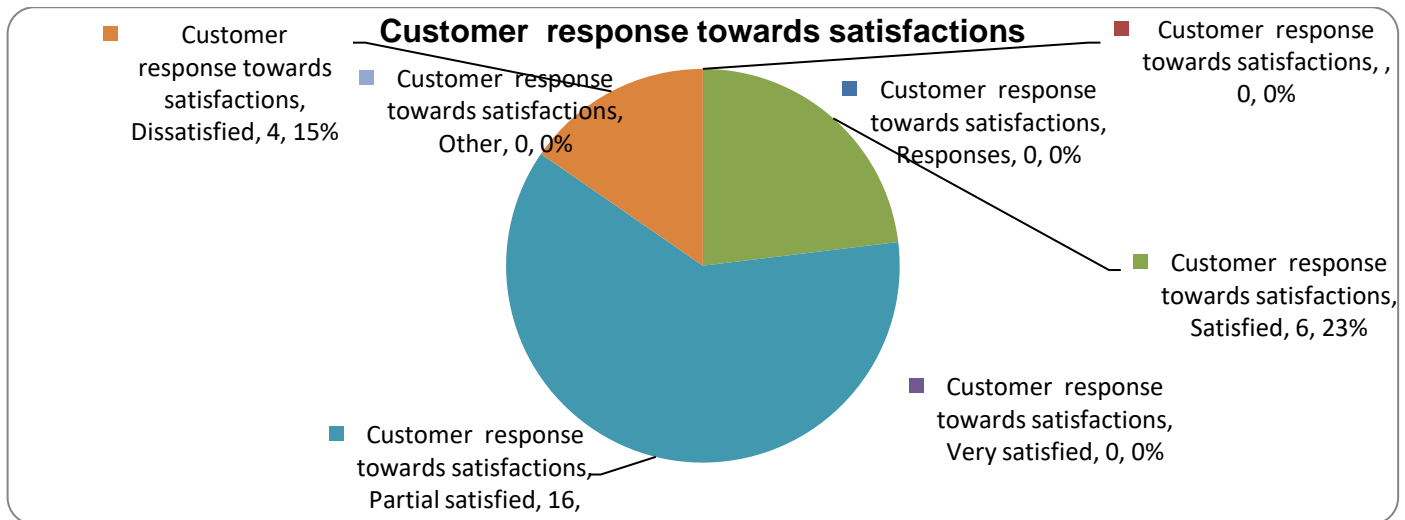


Source: From the findings obtained from respondents, (2023)

According to the data, nobody of the clients chose “other” or “I don’t know. “Only 15% of all customers who completed the questionnaires said they had not been receiving clean and safe water for their daily needs, whereas 46% of all customers said they had somehow received clean and safe water, making it not very safe and clean to use. 39% of all customers said they had been receiving clean and safe water and had no problems with the water.

• **Response by customers towards satisfaction on the service offered**

Figure 4.4: Describes the response towards satisfaction on the service offered



Source: Findings from respondents, (2023).

Neither of the customer responded were very satisfied with the water service offered,15% said are dissatisfied,23% said are satisfied and finally 62% responded that they are only partial satisfied from the waters service offerd by the auhtority.

All the customers involved where from domestic, business one like the one with hotels, shops, hospitals and other institutions like schols who do use the water service everyday in their daily activities.

Also the response from the intevieew perfromed,10 customers from the total of 12 said that they have just received some benefits such as; water connection for domestic uses which is somehow clean and safe for use ,water for irrigatioon in farming activites which have somehow enable them to survive in their daily life.

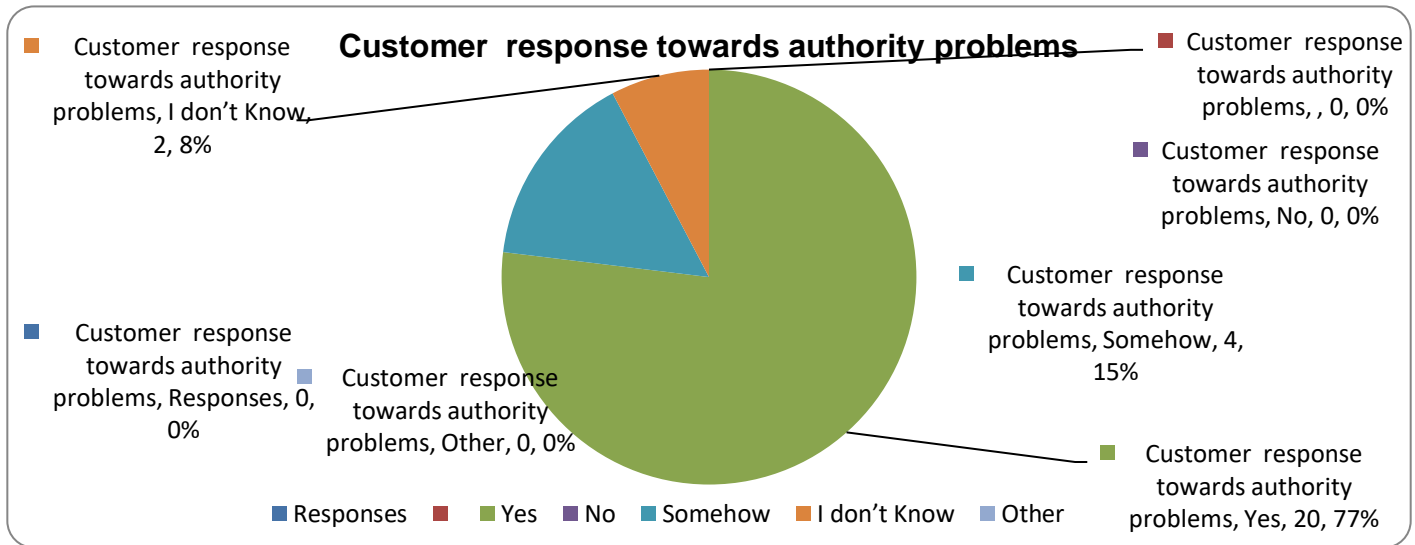
Although there were some benefits as responded by customers, some problems have been given below with their suggestions. The problems where such as;

- The reading of water Meter thus mis recording of the meter number which results to the over charging of monthly customer bill
- Water Shortage with no prior information given led to more clinets complains
- Poor or Late response towards customers problem

Therefore customer responded to the problems with some comments as follow:

- Prior information on water cut due to technical issues to create awareness to customers
- Accurate meter reading should be practice thus client should approve the bill before issued
- Daily and Quick response to clients needs, problems

Figure 4.5 Describes responses by customers towards authority problems



Source: Source: Finding from respondents, (2023)

The above figure describes the response of the customers towards authority problems. Customers were asked to select whether authority has problems and requires to changes. The response was; 77% of total customer returned their questionnaires said yes, thus the authority has problems and needs to change to improve performance. 15% said somehow the authority has problem and it should somehow change some things and 8% of customers said they do not know whether AUWSA has problems and needs to change. Lastly neither of the customer responded No and Other.

Swot Analysis

In order to determine the challenges involved, it included analysing the internal and external elements that affect AUWSA and determining its strengths, weaknesses, opportunities, and threats. Through the use of questionnaires, interviews, documents, and direct observation, the researcher gathered information on both internal and external aspects. The following were the findings:

Strengths of AUWSA

- The authority is at the good position thus it has no competitors as a response from the administration where by it has managed to develop and increase more revenue due to the reason of having a good number of customer depending on the service provided
- Also the authority has a system of assuring all employees are informed and updated for any special or urgent event required through the use of outlook and emails, land line phones which are internal line connected in each office (departments).
- The presence of good and enough equipment required in the water supply such as water pump generators despite it depends on the presence of electricity as most use electricity, special meter reading machines(which reduces errors in recording water bills results to reducing customer complains) and other important equipments required. It has been a strength to the authority from the assurance of better performance and increase employee morale in performance.
- The presence of good number of qualified and experienced employees who are well distributed in performing different tasks involved as far as water supply service is concerned for example good IT experts and other technicians, good number of engineers
- Good administration, competence in all field by assuring all tasks are well accomplished and for any

problem rise on the employees performance, the HR departments is very quick in resounding towards and solve the issue

Weaknesses further analysed

- Late reply in client queries to departmental sections which created misunderstandings and quarrels to the customers
- Un equal and fair tasks allocations and distribution among employees avoid workload, thus one departments can have more work compared to other departments
- Lack of advanced technology in the water supply chain such as security and tracing system that could assist in the water loss control, water pipes damage tracing, fuel control and other equipment involved.

Opportunities analysed

- There are enough water sources surrounding the city that could help water tapping such as rivers, bore holes, springs and unlimited control as its under the government so there is less restriction compared to other normal citizen on the usage of the sources involved
- More customer who need the service and depend full on AUWSA for the water supply service as they are no competitors at all
- The support availability of government support each financial year I expanding and improving service

Threats or Challenges that were analysed

- Also water theft, thus stealing which involves local connection and collection of authority water without the special permission or connection from the authority have been a great challenge faced resulted to the decrease of revenue
- Lick ages between the service and main line connected to customer it has been a great challenges and it may be due to poor connection made or loosing of the pipes connected due to rust resulted to the failure of AUWSA to capture and supply (sell) 100% water as expected as more than 15% of water produced have been lost due to the lackage. This is what is know by non-revenue water to the authority thus being lost with non payments
- Lack of understandings to customers towards various issues rose such as bill payments, shortage of water in their residents. the authority always tries to explain and give precautions for any problem raised but on the other side customer have been hard to understand unless they take time and later on they now accept and understand the situation
- Labour turnover for 02. % as said by the administration fro the past period. Although it has been seen for vey less % but in some extent it has been affecting the normal performance and resulting to the decrease of revenue, time and cost consuming in recruiting new applicants and also late delivery to customer complains/problems due to the absence of employee.
- Change in weather which have affected the performance and normal production of water for example during the dry season the authority have been producing less litres compared to rainy season ((32,000m³/day in dry season and 60,000m³/day during the rainy season) which have resulted to the shortage of water supplied to customers led to the increase in customer complaints on water shortage.
- Slow response in water bills payments. Some customers take more time in paying their bills thus exceeding the time given by the authority which forces AUWSA to incur other costs and time consuming in enforcing and insisting the payments
- The global warming effects have seriously affected the AUWSA water sources
- Power rationing (electricity problems) which has affected the water production and continuous apply to customers thus increased water shortage and customer complains. For example; the average water production for the third quarter was 34,471.274m³/day against the budgeted 40,455m³/day. However, in some cases, this low production was caused by power rationing, shortage as described

from the third quarter report financial year 2021-2022 (AUWSA, 2023).

CONCLUSION

It is a crucial issue to explore the effectiveness of the service supply chain. However, the study has managed to explore and address various issues related to the performance of the water supply services to customers using the case study AUWSA and a number of customers involved. It has been found that the authority performs different activities involved in water supply services in assuring full customer satisfaction but there are some problems that have been observed towards performance which tend to decrease the effectiveness in daily performance. Also from the customer perspective and response given, it has been found that, only 23 percentage of customers are satisfied, 62 percentage are partial satisfied and 15 percentage are not satisfied at all. Furthermore, it was found from the staffs response that the authority have somehow received the achievements in contrary to the expectations due to some problems that have been shown in chapter 4 which gives out the full picture that they have not gain full effective performance as expected.

Therefore, the authority must work much harder to ensure that the supply chain is managed properly by developing good plans, strategies, and procedures for conducting activities pertaining to the provision of water supply services. In numerous disciplines, learning and accepting adjustments when necessary is also important. All of these will help the authority provide complete customer satisfaction, strengthen its competitive edge, establish solid reputations, and improve the efficiency with which it provides water services.

RECOMMENDATION

Therefore the study has shown that the authority stills needs to improve its performance as far as water supply service is concerned necessary for the customer satisfaction. Management need to see the areas where the supply chain performance can be improved so that they can focus their attention and obtain high level of performance as said by Lambert and Pohlen, (2006).

The following are the recommendation and areas that AUWSA can follow and see for the increase of the effective performance and further customer satisfaction.

- Seeking more support from the government in financial issues which will enable the authority to have good number of specialists and other employees required with good remunerations, purchasing of more technological equipments required in water supply services
- The authority should encourage in motivating employees by providing some incentives like; bonus rewards, long and short courses trainings for the efficiency performance and building team.
- The authority should introduce well advanced system of tracing the water pipes for the securing and easily discovering of any lickages, problem happen in the connection instead of waiting and receiving information from customer or after surveying
- Also allocating good system such as online, email, permanent telephone number of receiving more suggestion and comments from customer as challenges and finding new ways of solving as well as accepting changes wherever necessary for the better performance.
- Furthermore the management should be able to identify risks that are expected during the supply services for the creation of future mitigation strategies to avoid obstacles or problems during performance. This will help to increase the effectiveness of the services. Risks are such as fire explosions, theft, electricity cut.

LIMITATION OF THE STUDY

The researcher faced the following limitations in conducting the exercise;

Low Response rate

Low response from the management and other employees of the Organization was an obstacle to the researcher during the study. Some respondents were not willing to cooperate and were unable to fill the questionnaires as appropriate and return them on time. Also not all the returned questionnaires were filled in as required by the researcher due to the low knowledge they possess despite the researcher selected them by believing their position and ability to express, fill the questionnaires as required.

Language

Language was also one of the problems faced especially during data collection from customers, some customers can only read, speak and write in Kiswahili. So the researcher had a challenge to interpret and further explain on the study especially the questionnaires and interview as required

Shortage of enough Time to respondents

Also the researcher faced a problem of time, thus some respondents like customers and other respondents from the Authority such as technical departments' staffs had been so busy and they had only short time to fill the questionnaires and no time to listen or being interviewed as required and invited.

Lack of familiarity with staffs, customers;

Due to the lack of familiarity, it was somehow hard to understand each other and create a confidence between customer, staffs and researcher. The technique used was to have pre-communication with staffs to create awareness and build relationship. Also getting more time explaining and building awareness to customers which consumed more time.

Financial issues

It is also one of the problems that the researcher faced in conducting his research as due to the rise of other costs from the budget set and other price fluctuations which appeared such as more transport costs during data collection period, meals, communication, materials involved especially in stationary such as photocopying, printing.

AREAS FOR FURTHER RESEARCH

The future study in this area can focus to evaluate in the following issues:

- Assessing the challenges or problems facing the supply chain in the service industries or organizations offering the service. In the study however it has only briefly discussed some problems facing in sec 4.2.3, chapter 4. Therefore, it is proposed that a future study should be carried out to explore more on this area.
- Examining the factors influencing the proper supply chain for the development of the service industry.
- Explore the major roles played by the management in assuring proper supply chain of service in the service industry as concerned. The study has just shown the activities performed by different departments in the supply of water services rather than examining the contribution of management.

Therefore, it is proposed that a future study should be carried to explore more on the contribution of management

CRITICAL EVALUATION AND CONSIDERATIONS

Small sample size

Only 30 questionnaires were issued to customer and only 26 returned and 22 were expected to be interviewed but only 12 attended while they are more than 1000 customers involved. Considering the large number of customers of more than 1000, shows that this sample size was still small and all these is due to time schedule, shortage of enough time. Also only 1 technical staff, 1 administration staff, 1 sale and bills payments staffs responded in the questionnaires. As a result, some of findings may not give a correct picture of the situation of the effectiveness of water supply services to customers. Therefore, generalizability of the study may be a problem.

- **Design of questionnaire**

The design of questionnaire was another problem in this study. There was no time allocated for piloting the questionnaire and also the language used was only English. Also most of the questions were closed ended were respondents were not given more areas to have more elaborations, for example customer questionnaires appendix 5.

- **Access to technical staff**

As the research was conducted the research and collecting data, there was a problem of getting the technical staff to attend interviews and even filling the questionnaires and most the time they were at the sites working.

- **Shortage of enough Time**

The dissertation time was not enough for the researcher. The time as so limited that the researcher could not be able to extend more time on data collection, more survey and investigation on the study.

SUGGESTED SOLUTIONS TO THE PROBLEMS FOR THE FURTHER BETTER RESEARCH WORK

In order to improve the results of this study, the following are some suggested solutions to the problems:

- The design of questionnaire needs to include both open and ended as well as both languages, Kiswahili and English or other respective language according to the specific group targeted
- The use of more interviews need to be extended to other expected researcher in order to obtain a clear picture of the expected study
- There is a need to increase the sample size so as to get more information and good picture of the study. There are some issues concerning the technical were not well addressed by the respondents, this showed, if their number could have been increased, there has been some elaboration on the issue.
- Increase and further extension of the dissertation time for the researcher to have more time in data collection, surveying and performing other activities related to the study for the accurate and more precise findings

ACKNOWLEDGEMENT

We would like to acknowledge the contribution of all participants in this study. Our appreciation to our supervisors for their guidance as well as to the authority management for the access of data collections and good cooperation towards conduction of the study.

REFERENCES

1. AUWSA,2023[online] available from<www.auwsa.or.tz> [accessed on 23rd Nov,2023]
2. Camden (2008) What are Research methods,[online] available from <<http://sociology.camden.rutgers.edu/jfm/tutorial/methods.htm>> [accessed on 21 Oct,2023]
3. Chopra, S. and Meindl,P. (2004) Supply Chain Management, 2nd Ed. Upper Saddle River: Pearson Prentice Hall
4. Chopra, S. and Meindl,P. (2007) Supply Chain Management, 3rdEd. Upper Saddle River: Pearson Prentice Hall
5. Christopher, M. (1992), Logistics and Supply Chain Management. London: Pitman Publishing
6. Christopher, M. (2005) Logistics and Supply Chain Management, 3rd Edition. London: Pearson Education Limited
7. Christopher, M. (2005) Logistics and Supply Chain Management, 3rd Edition. London: Pearson Education Limited cited in Kersten et al.,(2006b) Managing Risks in Supply Chains [online] available from
8. Christopher, M. (2005) Logistics and Supply Chain Management.3rd Edition. London: Pearson Prentice Hall
9. Council of Supply Chain Management Professionals (2011) [online] available from <<http://www.careersinsupplychain.org/what-is-scm/importance.asp> >[accessed on 12nd of Nov 2023]
10. Dalberg Global Development Advisors and the MIT-Zaragoza International
11. De Toni, A., Tonchia, S. (2001), Performance measurement systems: Models, characteristics and measures. International Journal of Operations & Production Management 21
12. Denscombe, M. (2007) The Good Research Guide, 3rd Edition. Buckingham: Open University Press
13. Ehow, (2012), What Is the Importance of Supply Chain Management? [Online] available from<<http://www.ehow.com/about/6122754/importance-supply-chain-management.html> > [accessed on Jan, 2024]
14. Ganeshan and Harrison at Penn State University in their article An Introduction to Supply Chain Management published at (http://silmaril.smeal.psu.edu/supply_chain_intro.html)
15. Ghauri, P. and Gronhaug, K. (2005) Research Methods in Business studies: A practical Guide, 3rd Edition. Harlow: FT Prentice Hall. Cited in Saunders, M., Lewis, P. and Thornhill, A. (2009) Research methods for business students,5th Edition, England: Prentice Hall
16. IBM Corporation, (2008) [online] available from <ftp://ftp.software.ibm.com/common/ssi/sa/wh/n/gbw03015usen/GBW_03015_USEN.PDF > [accessed on 21st September,2023]
17. Jacob,G (2008) An Empirical Study on the Impact of Supply Chain Practices on Competitive Position of MNEs in Malaysia [online] available from < <http://econ.upm.edu.my/ijem/vol2no2/bab10.pdf>> [accessed on 21st September,2023]
18. Jankowicz,A.D. (2005) Business Research Projects,4th Ed.UK: Thomson learning
19. Jean-Marie PLOTH, Supply Chain [online] available from <http://dmst.aueb.gr> [accessed on Nov, 2023]
20. Kahn, R. and Cannell, C. (1957) The Dynamics of interviewing. New York and Chichester: Wiley cited in Saunders, M., Lewis, P. and Thornhill, A(2009), Research methods for business students,5th Edition, England: Prentice Hall

21. Kelly, M. (2011) The difference between effectiveness and efficiency [online] available from <<http://www.vceit.com/pages/effective-efficient.htm>> [accessed on Nov, 2023]
22. Kothari, C.R.(2004) Research Methodology,Methods and Techniques,2nd Edition.India:New Age international Publishers
23. Lambert, D. and Pohlen,T. (2006) Supply Chain Management: Processes, Partnership and performance,3rd Edition, United States of America: Supply chain Management Institute
24. Lambert, D.M, Stock, J.R and Ellram, L.M (1998) Fundermental of Logistics Management, Irwin/McGraw-Hill, Boston, MA
25. Magigi, W. and Kazungu, I.(2012), How to write Research Reports, Tanzania: Thrust Publications Ltd
26. Martyn Shuttleworth ,(2009) [online] available from <<http://www.experiment-resources.com/what-is-a-literature-review.html#ixzz20yT9xmBQ>> [accessed on 18th Nov, 2023]
27. M (2012) Logistics/Supply Chain Guide [online] available from <http://logistics.about.com/od/supplychainintroduction/a/into_scm.htm> [accessed on 12nd of Sept 2023]
28. Quick MBA,2012, Strategy Management,[online] available from
29. Rushton, A., Oxley, J. (1989) Handbook of Logistics and Distribution Management. London: Kogan Page Ltd.
30. S. Li, B. Ragu-Nathan, T.S. Ragu-Nathan, S.S. Rao. (2006) The impact of supply chain management practices on competitive advantage and organizational performance Omega, 34 (2006), pp. 107–124
31. Saunders, M., Lewis, P. and Thornhill, A. (2009), Research methods for business students,5th Edition, England: Prentice Hall
32. Selltiz, C.S., Wrightsman, L.S. and Cook, S.W. (1981) Research Methods in Social Relations, London: Holt, Rinehart & Winston Cited in Jankowicz, A.D. (2005), Business ResearchProjects,4th Ed. UK: Thomson learning
33. Stewart, D.W. and Kamins, M.A. (1993) Secondary Research: Information Sources and Methods, 2nd Edition. Newbury Park, CA: Sage cited in Saunders, M., Lewis, P. and Thornhill, A. (2009), Research methods for business students,5th Edition, England: Prentice Hall
34. Water Supply and sanitation in Tanzania [online] available from
35. What is risk [online] available from
36. Whatisriskmanagement.net. The Importance of Risk Management to business[online] available from<<http://www.whatisriskmanagement.net/>> [accessed on 27th Oct,2023]