Ministry of Education and Science of Ukraine

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DEPARTMENT OF ECONOMICS, ENTREPRENEURSHIP
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MASTER THESIS

Topic: **Impact of green supply chain on organizational performance.**

Specialty 073 «Management»

Study program 8.073.00.09 "Business Administration"

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«___» _____ 20__ .

ASSIGNMENT

for the master thesis

Student of group *BA-m-91Ah/1i, 2 year of study, FEM*

Specialty 073 "Management"

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ABSTRACT

The Green Supply Chain has become a global issue due to its negative effects on the ecological environment, the economy and general livelihoods. GSC is widening the conventional supply chain to incorporate practices aimed at reducing the environmental effect of a product during the whole cycle, such as green construction, cost savings, the removal of hazardous materials and the recycle and re-use of goods. This research aimed to examine the impact of GSC on the performance of organizations with a concentration on the Greater Accra Metropolitan Region.

The analysis used a detailed cross-section design. A basic random sampling technique was also used for the survey of fifty (50) respondents. Data was analyzed using the Statistical Package for the Social Sciences (SPSS).

The study finds that the environmental effect of GSC on organizations is also significant. Again it was discovered that GSC has an economic and operational effect on organizations, but not to a very significant degree. Finally, it was revealed that the organizations are taking GSC steps to minimize or reduce the detrimental impact SC has on the environment, the economy and the organization itself.

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LIST OF ABBREVIATIONS

SCM	Supply Chain Management
SC	Supply Chain
GSCM	Green Supply Chain Management
GSC	Green Supply Chain
GWP	Green Warehouse Practice
EU	European Union
EMS	Environmental Management system
GAMA	Greater Accra Metropolitan Area
SSHJ	Social Sciences and Humanities Journal
SPSS	Statistical Package for the Social Sciences
HND	Higher National Diploma
Org	Organization
Fig	Figure

INTRODUCTION

This chapter encompasses the background of the study, problem statement, research objectives and research questions, Justification of the study, scope of study and limitation of study.

Background of study.

In current times, environmental consciousness has become increasingly relevant, according to Dunning (1993), as demonstrated by examples from both everyday life and business practices. Around the world, organizations are also attempting to integrate their industry into a more sustainable system. Thus, environmentally friendly SCM has arisen as an important philosophy of the company. It helps to achieve the goals of corporate revenue and market share by reducing the costs and impacts of the environment while modifying the environmental efficacy by these organizations and their partners. The competitive and global aspects of these two subjects cannot go unnoticed by companies as a synergistic combination of environmental and SCM. For example, multinational corporations have developed global supplier networks to take advantage of country-industry-specific characteristics to create viable benefit.

Laosirihongthong, Adebanjo and Tan (2013) indicate that in academic literature, ecological concerns and the implementation of green initiatives in the SC have been a contentious topic. The developing intrigued within the environment and climate alter and the endeavors by governments and organizations around the world to diminish their natural affect reflect this interest. According to Sarkis, the assimilation of environmental challenges and SCM has been a flourishing subfield over the past two decades (2012). Despite its growing popularity in developed countries, many areas of GSCM also needs more study, especially as regards the greening of the SC has been recognized as a principal subject of sustainable SCM.

Environmental concerns have grown and travelled quicker than forest fires, country by area and region to world-level territories, which are a serious cause of climate alteration and global warming. In addition to natural resource shortage, air and water pollution have a bad effect on fauna and flora, human life with numerous diseases that they certainly cause, such as ischemic/ischemic heart disease, lung cancer, chronic pulmonary obstruction disease, stroke, dracunculiasis, Cholera, Hepatitis, Typhoid fever, and Norovirus. If the idea of the GSC takes place by the introduction of green practices in business processes, environmental degradation that regulates emissions of air, water and waste is mitigated. Undeniably, enhancing environmental sustainability is the rudimentary philosophy behind the green concept, but businesses embrace the green concept as a vision of multi-tasking. Since the GSC can minimize carbon and production expenses and can also improve economic growth, create a competitive edge in terms of increased customer satisfaction, a good reputation and prestige, and offer better options for their products to be sold to environmentally sustainable countries (Syed, 2018).

Beamon described Green Supply Chain (GSC) is the expansion of traditional supply chain to include activities aimed at minimizing a product's environmental consequences throughout its entire cycle such as green design, saving resources, reducing harmful materials and recycling and reuse of products (Qorri et al., 2018a). While some early researchers focused on models of carbon emissions and contamination studies, until the past decade, "green" as a term was not institutionalized. GSC is a term that incorporates green sourcing, packaging goods environmental management, environmental circulation, marketing, and reverse logistics. Hervani et al. (2005) may have been the first scholar to fit a concise definition of the GSC. However the concept of Sarkis (1998) was much narrower in focusing on a mixture of an environmental company's operations and reverse logistics, and stressed the value of the latter (Hassan et al., 2016).

GSCM is described by Matthew et al. (2019a) as an idea of incorporating sustainable environmental processes into the conventional supply chain. It incorporates sustainability thinking into the operation of SCM. The entire process, including preparation, acquisition, production, use and reverse logistics, is built into it. It is an area that is changing fast-moving, and multidisciplinary.

Aslam et al. (2018) notes that the idea of GSCM is based both on environmental conservation and on SCM literature (Zhu, Qu, Geng, & Fujita, 2017). Literature on environmental sustainability notes that by implementing environmentally sustainable structures, companies can protect the environment. By introducing the green aspect to it, GSCM adopts the concept of supply chain leadership (Frödell, 2011). GSCM is described as the managing of SC in such a way that their adverse environmental effect can be minimized. GSCM activities not only aim to keep the world friendly for companies, but also help to optimally exploit natural capital to increase the profitability of businesses.

Problem statement.

Exponential increases in industrialization have led the world to environmental destruction in the last two decades. Not only does industrial waste harm human health, but it is still a threat on the global environment. Traditionally, SCM has been seen as a mechanism in which raw materials are processed into finished goods, and shipped to the end customer. Natural resource mining and exploitation are included in this process. Nowadays as regards environmental sustainability, most companies are beginning to go green in their business. The greater value of green technology implementation in corporate processes has been realized, and has also impacted vendors and consumers (Puviyarasu, 2016).

Some writers have envisaged major advantages in relation to GSC practices. GSC practice is still a myth to be followed by most businesses in developed countries, as they still retain traditional supply chain practices with either little or no

concern for the environmental effects. It should be remembered that the introduction of the 'green' definition to the SC does not inherently alter the entity's traditional supply chain. Recent studies on GSCM practice have shown that collaborative partnerships between producers and suppliers are strengthened and how the gap can be bridged to facilitate managerial decision-making (Ekane and Nshimirimana, 2012).

It is without reservation that most organizational operations have many impacts on the environment, the economy and as a matter of fact, on a nation as a whole. With organizations managing their operations without integrating greening into their whole supply chain scheme, it is becoming more precarious.

However, organizations' incorporation of GSC into their management structure has a number of effects on the efficiency of organizations. Practicing GSC in a management structure of an enterprise would undoubtedly be of benefit to those companies involved if it is handled appropriately and effectively.

Research objectives

This thesis aims primarily to analyze the impact of GSC on organizations' performance. Specifically, the objectives are to;

I. Find out whether greening in the SCM has any impact on organizational performance.

II. Find out if participants have knowledge of GSCM.

III. Examine if the activities of the GSCM have an impact on the efficiency of the company.

IV. Illustrate measures taken in an organization’s GSCM.

Research questions

i. Does GSC have any impact on organizational performance?

ii. Do you understand GSCM and its practices?

iii. What consist of organizational performance in a GSC?

Scope of study

This very study evaluates GSCM and GSC performance. Also, this research work focuses on some of the well-known green practices which are been inculcated by organizations in recent times. Some of GSCM practices are; Green transport, green manufacturing, green design, green warehousing, etc. This study further examines the associated impacts that these green practices have on organizations which use them. Lastly, this research examines if organizations take some GSC measures.

Justification of study

The aim of this research is fundamentally to evaluate the effect of GSC on the performance of organizations. Also, to specifically spell out if most people do know and understand GSCM and green practices. There are many reports and strategies discussing the management of the GSC and the environmental consequences. This study aims to address how companies handle green practices and also adopt them. This study will also find out whether organizations take any GSCM measures. This study will help to:

Encourage organization which are not practicing "greening" in SCM system, the importance of greening their supply chain management.

Limitations of the study

There are several limitations to the study of this very thesis. Some such limitations faced in this study are;

i. The unwillingness of some organization to provide information.
ii. Inaccurate information being given out.
iii. Inability to collect data from organizations personally.

CHAPTER 1. Theoretical approaches of Green Supply Chain formation

1.1. Green supply chain management (GSCM)

The concept of GSC originates from the notion of green purchasing proposed by Webb in 1994. GSCM, or sustainable management of the supply chain, is a holistic theory newly introduced to help businesses and policymakers enhance the environmental sustainability. In terms of goal, management framework, business model, business process, and usage pattern, GSCM is distinct from SCM. The growth of GSCM can be a result of increasing understanding of increasing waste, carbon emissions and worsening environmental standards among governments, companies and consumers (Matthew et al., 2019b).

GSMC is described as incorporating environmental consciousness into the management of the supply chain, involving product design, procurement and selection of products, production processes, distribution to customers of the finished product and end-of-life management of a product after its valuable life. (Al-Zu'bi, 2014).

Aslam et al. (2019) points out that GSCM includes integrating sustainability thinking with SCM, comprising of product design, selection and sourcing of components, production processes, distribution to consumers of finished goods, and recycling after use. GSCM is not just about being eco conscious, but also about being a driver of economic merit and honest market sense.

Hervani, Helms, and Sarkis (2005) note that the idea of ecological sustainability has been regarded by many studies as a basis for researching management practices in both institutional and strategic contexts. Other reports have explored the greening of supply chains in multiple contexts as part of this initiative, including product design, process design, production, and a diverse mixture of these components. Not unexpectedly, GSCM finds its meaning in the management of the supply chain. The

inclusion of the green aspect of SCM includes discussing the effect of SCM on the natural environment and its relationships.

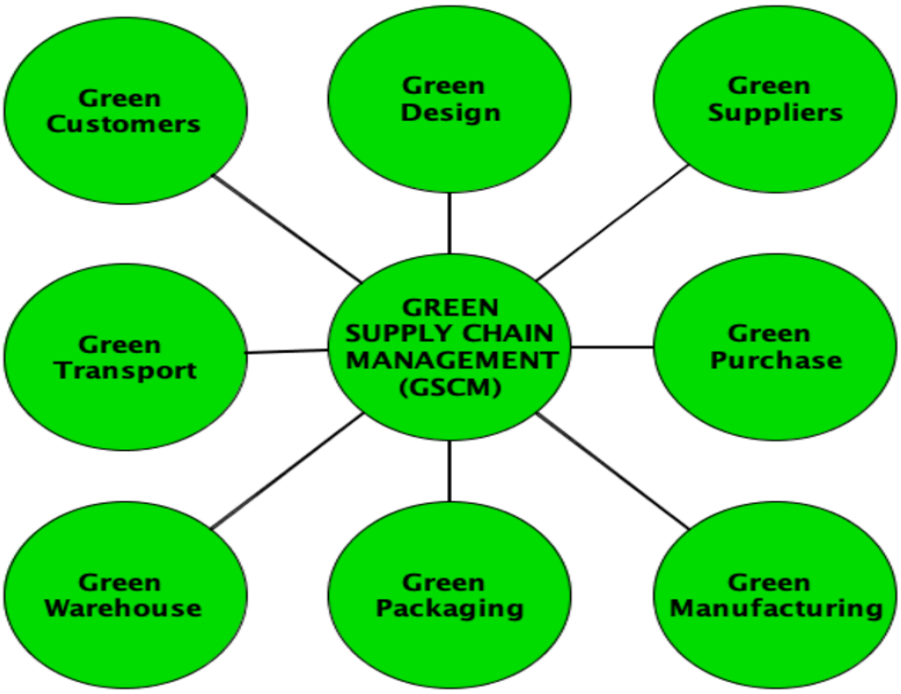


Figure 1. Components of GSCM (based on Fritz M. M. C. 2019)

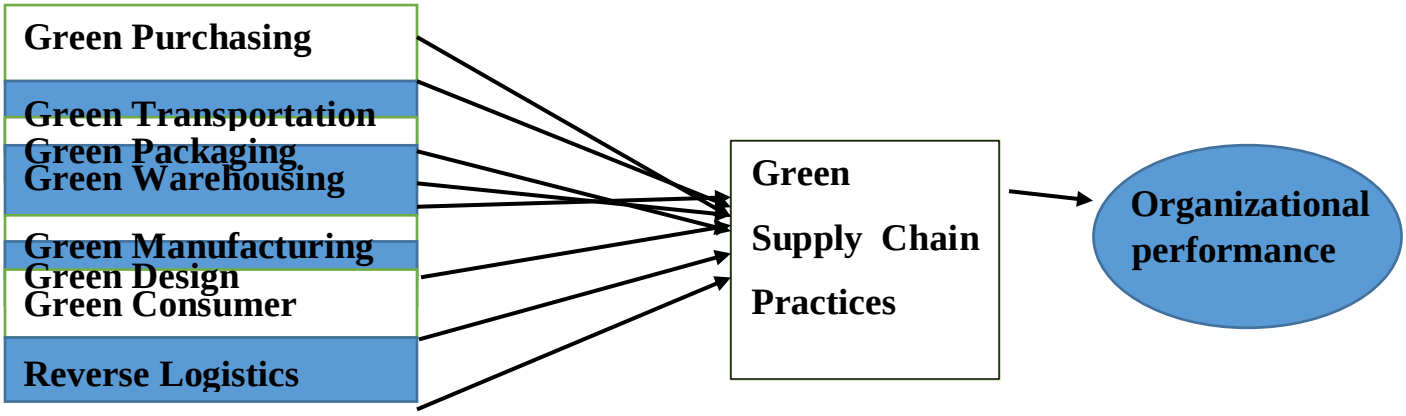
1.2. Green practices in supply chain management.

The activities of the GSCM are steps that companies adapt to conform to environmental regulations, minimize detrimental impacts on their processes and improve the efficiency and performance of the SC. GSCM practices also include coercive and vulnerable initiatives, and both inter-organizational and intra-organizational practices should be incorporated. Such approaches enable the focal company to cooperate with suppliers and customers (Qorri et al., 20).

GSCM has been operationalized by researchers in numerous ways. In terms of green development, green supply range, green buying, green architecture, reverse logistics, and green delivery, GSCM can be operationalized. Another range of GSCM practices covers internal environmental protection, eco-design, green buying, collaboration with clients, and recovery of investments Foo et al. (2019).

Cost minimization is viewed as the most important factor for businesses to conform to green standards of their supply chain operations. The development of GSC strategies would continue to reduce the cost of reused, recycled and remanufactured products for packaging, components and items. In the other hand, to improve social productivity, corporations also adopt green standards in their business activities. Without compromising environmental beauty, societal achievement requires improving the level of people's way of living. In addition social success involves enhancing the credibility of businesses and improving environmental quality, as well as reducing risks to the environment.

Figure 2. Research Framework model



There are many green practices that are used by companies to increase their efficiency and income, as well as environmental growth in their everyday businesses and supply chain operations. Some of the well-known green practices outlined by

various scholars, such as (Syed 2018, Gábriel 2016, Dube et al., 2011, Darnall et al., 2012, etc.), are below.

- Green material sourcing/purchasing

Green sourcing means the procurement or acquisition of goods and products with eco-friendly characteristics such as reusability, recyclability and non-use of dangerous/dangerous chemicals that are enviable. With growing environmental protection issues, procurement professionals have been inspired to rethink their current sourcing, purchasing strategy and environmental sustainability effect. The task of eco-friendly buying is that recycling and remanufacturing are involved. In addition, Min and Galle stressed that green procurement increases recycling, remanufacturing and other supply chain operations to facilitate waste reduction. To investigate the influence of green policy on the environmental and financial results of firms, Carter and Rogers conducted analysis. They concluded that because of the effective realization of the green buying approach, the expense of goods is decreased and the environmental efficiency and financial performance of businesses is improved with a decent reputation obtained in the industry.

Eco-friendly sourcing has a positive relationship with the operational and environmental performance of companies. Green purchasing was split into five major aspects: design management, supply chain management, environmental authentication and environmental and external management. They found that green buying increased the productivity of the companies as a whole. The introduction of green buying in the SC and market processes is a reliable tool for reducing land, air and water emissions.

- Green transportation

Green transport is a modern concept and a target of practice, explicitly referring to the urban transport system that is convenient, safe, proficient low pollution,

humanized and diversified. It adapts to developments in environmental growth, is driven by public transport and co-ordinates with the climate and urban development of the environment. Along with the sustainable development framework, which is the transition from vehicle-oriented to people-oriented the green transport concept is proposed. The reduction in the use of individual motors, the increased use of cycling, bicycles and public transit, and the use of renewable energy and vehicles was promoted by green transport. It is a low cost and pollution-free transportation system that saves all modes of travelers from ground and space. Not only is green transport a low-carbon and environmentally friendly mode of travel, but it is a return to a safe and recreational lifestyle. The construction of green transport infrastructure is ideal for the comprehensive use of resources to reduce traffic congestion, to reduce energy consumption in order to save energy, to reduce exhaust emissions in order to improve air quality, to cut emissions in order to reduce greenhouse impacts and to create viable cities in terms of improving environmental health.

Walking, riding, frequent public transit and rail transport are part of the green transportation scheme. Green transport vehicles comprise various low pollution automobiles from a transport vehicle viewpoint, such as dual-energy vehicles, natural gas vehicles, hybrid vehicles, hydrogen power vehicles, and solar energy vehicles. Green mobility also comprises numerous types of electrified transport equipment, such as trolley buses, tram cars, commuter rail and metro trains (Li, 2016).

- ❖ Green Packaging

Packaging design is crucial for achieving the environmental goals of a company. While it addresses such needs specifically related to the delivery of the product, it is not part of the actual service that the product provides. In either case, in several ways, it affects the climate. Concerning packaging, the following principles can apply. Limit packaging to the appropriate size and style of packaging for replenishing or recycling and where necessary, use standardized packaging. In reorganizing the

packaging strategy, Xerox has changed its packaging and set up centers for packaging reuse in the United Kingdom, the Netherlands and the United States. Moreover to eliminate waste, the volume of internal packaging has been limited.

- Green warehousing

Through coping with all potential practices involved, green supply chain and logistics have minimized the environmental effects, one of which is warehousing. It serves to safeguard the environment morally and to conform to the lowering in operational costs in the long term by practicing greener warehouse operations. The optimization of warehouse operations to be environmentally friendly may also be used to increase the company's performance and productivity. Warehouse is known as a distribution center in which goods from inbound and outbound as well as for many other purposes ranging from distribution to composite storage are housed at a specific location, a building or a logistics support center (Lew et al., 2019). Green industrial construction activities are often associated with the practice of green warehouses (GWP) and the research of GWP is significant because of its effect on the environment, the economy and society. Furthermore, the need for GWP in the logistics industry is of primary importance due to the growing pressure and environmental issues about carbon footprint (Wahab et al., 2018).

- Green manufacturing

A green manufacturing process can use inputs with minimal environmental effects, work with high productivity and produce the least amount of waste and emissions. Green manufacturing approach involves reducing the control of hazardous substances by the utilization of resources; decreasing the use of energy is energy-efficient technology and increasing the ratio of green energy and incorporating different types of material reuse into the disassembly, refurbishment, remanufacturing or recycling of the manufacturing process.

❖ Green design

Green design (or eco-design) seeks to reduce the effect of a commodity on the environment during its life cycle without compromising other primary product criteria, such as performance and cost. Green design, in other words, involves the design of goods or services with a certain knowledge of the environment. This is also a core concern for the EU. The main goal is to establish, in all Member States, a healthy, diversified and environmentally sustainable energy system, which is a complicated future objective. Green design involves the design of reuse, recycle or remanufacturing goods for decreased use of toxic materials and product design for resource performance.

❖ Green Consumer

A green customer is someone who, when buying green goods or services selectively, is mindful of his or her responsibility to protect the environment. A green consumer tries to maintain a healthy and safe lifestyle without jeopardizing the planet's sustainability and mankind's future. Today, 50 percent of consumers purchase green products, according to a recent study. Green buyers are supposed to be more cautious in their usage of energy, such as buying their items without wasting energy (Wijekoon & Sabri, 2020). Purchasing, reusable toilet paper, energy saving electricity bulbs, herbal cleaning items, recycled stationery, organic clothes are part of green consumption (i.e., organic cotton or hemp). It may also require the procurement of more robust goods that optimize electrical products and appliances for energy efficiency. Together these instances show the different buying and non-purchasing decisions that make up the overall green consumption of a person (Darnall et al., 2012).

❖ Reverse logistics

Green reverse logistics is the mechanism by which the end user (consumer) gathers the components or parts in order to recapture value or dispose of the materials

in an environmentally sustainable way. The chain is shielded in the opposite direction by reverse logistics. Activities such as waste recycling, collection of pieces, inspection, selection, sorting, direct reuse, reprocessing, redistribution, and disposal require green reverse logistics. Recovering goods, refurbishing items, and retrieving pieces that can be recycled or reused, such as precious metals, can provide a tremendous benefit to the world and the producer. In view of the above, the preference and effectiveness of these green activities depends on an organization's policies and capabilities (Mutingi et al., 2014).

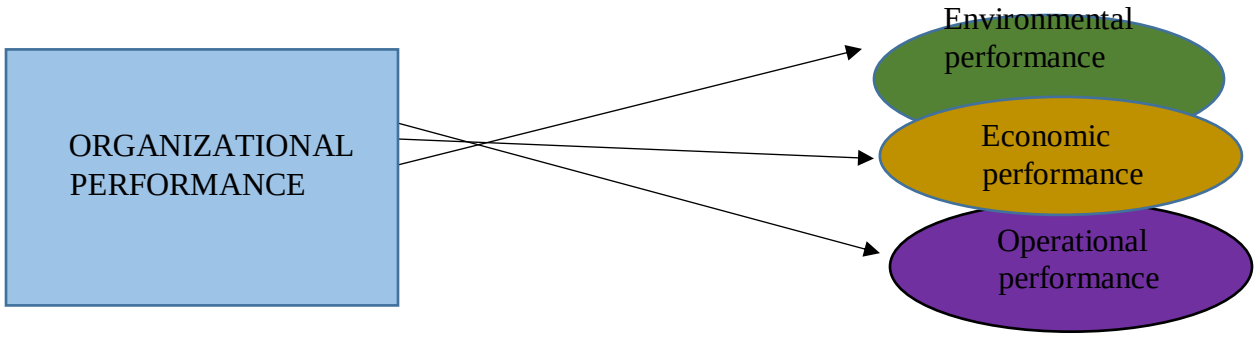
1.3. GSC on Organizational performance

Rha (2010) notes that over the past decade, GSCM has emerged as a vital aspect of environmental and supply chain policy for a variety of organizations. In recent years, several reports have analyzed the financial and ecological efficiency of GSCM. Walley (1994) indicated that many managers view environmental management as compliance with regulations when assessing tradeoffs between environmental and economic effectiveness. Some empirical research, however, has shown that substantial environmental management performance leads to lower production costs by eliminating waste (Allen, 1992). Rao and Holt (2005) observed that, organizations adopting GSCM in the South East Asia region gradually increased both efficiency and economic performance. An analysis showed that environmental success had a favorable impact on the economic success of businesses by raising market share and reducing costs. The reasons why the results of these studies differ from each other can be as a result of the variability of organizations and industries applying ecological management activities.

Ali (2014) argues that the natural, organizational and economic/financial efficiency of organizations can be enhanced through GSCM practices. Through implementing GSCM practices, businesses will increase their operating efficiency by

enhancing the quality of goods and improving distribution facilities. GSCM programs also allow businesses to enhance their environmental efficiency, such as lowering carbon emissions, removing waste from the end-to-end supply chain, reducing communication costs and encouraging reuse, recycle and remanufacturing through reliable and strong cooperation with suppliers. Integrated into the industrial plan of businesses, the environment management system (EMS) would assist companies to increase their environmental efficiency.

Figure 3: Areas of organizational performance



Organizational performance constitutes of environmental performance, financial performance, and organizational performance, in line with Diab et al. (2015).

Environmental performance involves and focuses on reducing air pollution, reducing waste water, reducing solid waste, reducing use of hazardous/harmful/toxic products, lessening the event of environmental incidents, and improving the environmental circumstance of an organization.

Economic/Financial performance requires and focuses on positive economic performance, reductions in material purchasing costs, decreases in energy usage costs, decreases in waste treatment fees, decreases in waste discharge fees and at the same time, attempts to eradicate negative economic performance, such as increased expenditure, increased operating costs, revenue, etc.

The **operational performance** comprises reduced costs and increased consistency, lower stock levels, reduced throughput time, enhanced responsiveness

and faster distribution (Azadeh et al., 2016). Any company needs to be operationally effective in it. This progress reflected in the increment in quantity of goods delivered on time, the decrease in inventory levels, the decrease in scrap rate, the promotion of the quality of products, the increased product line and the improvement of capability utilization.

CHAPTER 2. Research Methodology of Green Supply Chain formation

This chapter principally deliberates on the study technique that was used by the researcher to accomplish the research objectives. The chapter has been organized into several areas to give a clear outline for the utilization of the research methodology. The areas include research design, research area, study population, sample size and technique, source of data collection, research instrument, procedure for data collection and data analysis. Altinay and Paraskevas (2008) find out that in order to assess the hypotheses against empirical proof, positivist researcher attempts to take a separate approach from the study issue by using facts and organized methods.

2.1. Research Design

The cross-sectional layout was used for the analysis. This experimental design is an observatory research that entails collecting a subset of a population over a shorter span of time at a given period without the study setting being manipulated. The cross-sectional analyses were thus directed at presenting, at a given point in time, a 'snapshot' of the result and the features associated with it. This design is fitting for the analysis because it used the public's sampled thoughts to generalize the target population.

Quantitative research approach

In fact, the quantitative approach takes a positivist natural science paradigm and offers an external, empirical truth of social life (Bryman & Bell, 2007). According to

Hittleman and Simon (2002), quantitative study is distinguished by the use of statistical analysis to identify, compare and assign causalities. Generally quantitative analysis is known to be objective. To obtain knowledge about the universe, it utilizes numerical data. McMillan and Schumacher (2006) add that by using numbers, statistics, structure and power, this research technique maximizes objectivity. In this light, researchers conclude that the best way to measure the properties of the study phenomena is by quantitative tests, because quantification renders observation quite explicit (Babbie & Mouton, 2001). The reason for using this method is to measure organization's views in relation with the research subject because of its appropriateness. Secondly, since the observations may be applied in a large setting, a quantitative approach has been utilized.

Qualitative research approach

A methodical approach that requires discovery is qualitative analysis. In a natural environment, qualitative analysis is often defined as an unfolding paradigm that helps the researcher to assess a degree of detail from a high level of involvement in specific experiences (Creswell, 1994). A contextual analysis describes the social phenomenon being analyzed from the participant's viewpoint.

Again in order to define, explain, and interpret collected data, qualitative research requires decisive usage. Leedy and Ormrod (2001) thought that qualitative analysis is less conventional in concept, as it formulates and builds new theories. Qualitative study can also be interpreted as an efficient model that takes place in a natural environment that helps the researcher to establish a degree of detail by being highly active in real experiences (Creswell, 2003).

Within a poststructuralist model, qualitative research is performed. There are five qualitative research areas: case study, study of ethnography, phenomenological study, study of grounded theory, and review of material. These five fields are

descriptive of research focused on inductive reasoning and methodologies associated with it.

Qualitative analysis uses inductive reasoning to construct a base instead of deductive. It is from the observational aspects that answer concerns that the investigator seeks to clarify. A marked difference from quantitative analysis, where the investigator is solely outside the phenomenon being studied, is the close association between the observer and the results.

2.2. Research Area

The think about was conducted within the Greater Accra Metropolitan Region (GAMA). It is geologically found on the South-East Coast of Ghana on the Inlet of Guinea, which shapes portion of the Atlantic Sea. It amplifies from scopes 5°5′27″ N to 5°28′2″ N and extends between longitudes 0°4′58″ E to 0°37′2″ W (Figure 4). GAMA covers an add-up to region of 1497 km2 and houses the capital city of Ghana (Accra) and the country's most unmistakable seaport (Tema), making it the major financial and political center of the nation. It has experienced a fast populace development due to common increment and in-migration from other locales and the provincial hinterland. Correspondingly, the region is characterized by a tall populace thickness with a populace of 4.6 million individuals as of 2016 and a normal development rate of 3.5% per annum. Anticipated development appears that by 2040, the populace of GAMA will twofold to 10.5 million. A coordinate suggestion of the prior is that the locale will be beneath noteworthy weight to urbanize.

GAMA has experienced quick outward urban built-up development, which has driven to visit transformations from diverse land-cover sorts. The scene is for the most part characterized by undulating marsh with pockets of inselbergs. Environmentally, GAMA encompasses coastal scrubs, meadow and mangrove overwhelm, as well as little parcels of guinea savannah and sodden semi-deciduous

woodland. All of these are right now being debilitated by urban arrive extension (Akubia et al. 2020).

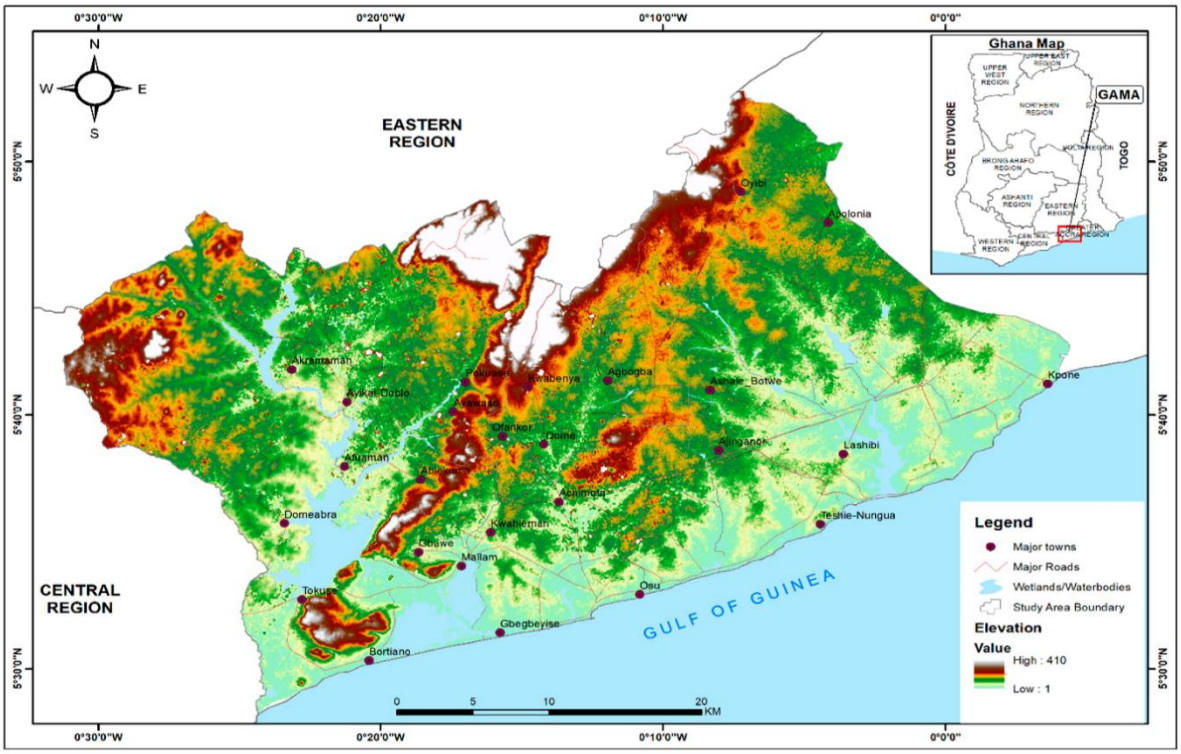


Figure 4: Study area location

2.3. Study Population

All organizations in Greater Accra area were included in the targeted sample population. However the emphasis was on organizations based in the metropolitan areas of Accra and Tema. Due to their industrious disposition, the reason for choosing organizations in these locations is. In Greater Accra region of Ghana, Accra and Tema are the places where most organizations or businesses can be found. The organizations in these zones are therefore ideally tailored to the targeted population.

2.4. Sample Size Determination

To assess the sample size of the population, researcher may use Taro Yamane's format and frequency distribution technique. This procedure for measuring the

sample size was developed in 1967 by statistician Tara Yamane to calculate the sample size of a given population.

Yamane technique;

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

Where: **n** represents the sample size

N represents the population under study

e represents the margin error (it could be 0.10, 0.05 or 0.01)

And the frequency distribution method is given as;

$P=^{F}/_{S} \times 100\%$

Where p = Percentage of the frequency

F = Frequency of the distribution

S = Sample size

100 = Constant

2.5. Sample size and Technique

A sample size of fifty (50) was used for the purposes of this study, where either one (1) or two (2) respondents are selected from an organization.

The method of choosing the correct people, items or events to represent the entire population is known as sampling. Basically, there are two types of sampling methods that are: probability and non-probability of sampling. The population elements have a definite, non-zero probability or probability of being picked for survey sampling. The components have no established or fixed likelihood of being chosen as subjects for non-probability sampling (Sekaran & Bougie 2016). For the purposes of this study, a simple random sampling technique (example of a probability sampling technique) was employed in selecting the organizations. The simple random sampling technique was employed because the population understudy are relatively homogenous in nature. Again any respondent has the same opportunity

to be chosen. In selecting a sample through simple random selection, it is apparent that the researcher cannot intentionally introduce sampling bias. Any bias, which may occur, would be by accident, as a result of chance. The likelihood of introducing bias by chance would reduce as the size of the sample selected increases.

2.6. Sources of Data Collection

The study made use of both primary and secondary data. Primary source of data is the data type made by the researcher especially to address the research problem (Malhotra & Birks, 2007). Primary data are firsthand information gotten for a research. This was achieved in the form of answers obtained from the respondents by the use of the questionnaire. Data collected already in books and reported in them are referred to as secondary information sources and are typically stored in archives, progress notes, annual reports, financial records, electronic and other related media (Bryman, 2008). For the purposes of this analysis, secondary data sources were primarily derived from books and journal articles related to the subject. Finally, other relevant and credible online sources such as Sage, Emerald, Elsevier, SSHJ, CenRaPS, etc. were access to retrieve more information.

2.7. Research Instrument

The questionnaire was used as the primary knowledge collection method in this analysis. It was designed using 5 point Likert scale based on "strongly disagree" as 1 and "Strongly Agree" as 5 at some sector of the questionnaire. The first section involves personal information of respondents. Again, the subsequent sections were based on each independent variable. The questionnaire was identified by Altinay and Paraskevas (2008) as being the most favored survey method. It was suggested that the questionnaire is a well-designed tool that offers a great means of collecting information from a wide number of respondents at an affordable cost. Another reason is that questionnaire survey provides great flexibility for the respondents and the researcher (Hair, Babin, Money & Samuel, 2003). A questionnaire allows the

researcher to obtain generalized findings from large sample size (Collins & Hussey, 2003). Finally, the advantage with a questionnaire methodology is its privacy, which allows respondents a greater opportunity to more candidly expose their reasoning, feelings, undesirable actions and mood (Hair et al., 2003).

2.8. Data Collection Procedure

A survey approach was used for the administration of data. A survey provides people with insights about who they are, how they think and what they do (Balnaves & Caputi, 2001). Furthermore, Zikmund (2001) refers to surveys as a quick, reasonably inexpensive and precise way of investigating a research phenomenon.

The researcher introduced himself to each respondent before data collection, and briefly explained the purpose of this study to each participant. Following from this, the researcher sought for the consent of each respondent to participate freely without no harm or material benefit in the study. Consent was mainly verbal. Participants were assured of their confidentiality and anonymity. The importance of candid responses was emphasized. The researchers presented the questionnaires to the respondents themselves directly after the briefing. A minimum of twenty minutes was allotted, during which the researcher was present to support the respondents when they had some trouble.

2.9. Data Analysis

Data collected was analyzed by using the Statistical Package for Service Solution (SPSS) version 20.0. The first stage of the analysis was to code all variables of the questionnaire into the SPPS program. In this research, a numerical coding system was used to convert responses of closed ended questions into numbers.

“Missing data” codes was employed where the question was not answered. In this research, questions with no answers were considered as missing data and excluded from the data analysis.

The next phase which followed is data entering. Thus, a process of inputting all responses on the questionnaire into the SPSS program. After this phase was the analysis of the data. During this stage, the researcher employed the use of a descriptive statistical analysis to present data in a form of frequency table, and charts and finally produced a report base on the figures derived from each frequency table and charts.

CHAPTER 3. Empirical findings and Analysis of Green Supply Chain formation

3.1 Demographic Characteristics

This chapter discusses the conclusions of the findings of the report. The analyses have been structured in accordance with the study objectives. Some respondents didn't answer questions 13a, 14a and 15a because of the fact that, they didn't strongly agree or agree to questions 14, 14 and 15. Hence, a missing value was marked as 99 in SPSS. A cumulative frequency of 50 responses was completely collected from the sector. Data obtained from the field were described and analyzed by the researcher using Frequency Distribution Tables, Bar Charts and Pie Charts. The details collected from the respondents are visually displayed here.

In assessing the study participants' demographic characteristics, 80.0 percent of the respondents were male, while 20.0 percent of the respondents were female. Results from this research suggest that more men are working in organizations rather than women in the field of study. Once again, 48.0 percent of respondents had been between 30 and 39 years of age, while just 8.0 percent had between 20 and 29 years of age. The results indicate that respondents are late-young and thus, in view of the high unemployment rate in Ghana, the manufacturing (secondary sector) is more viable for growth.

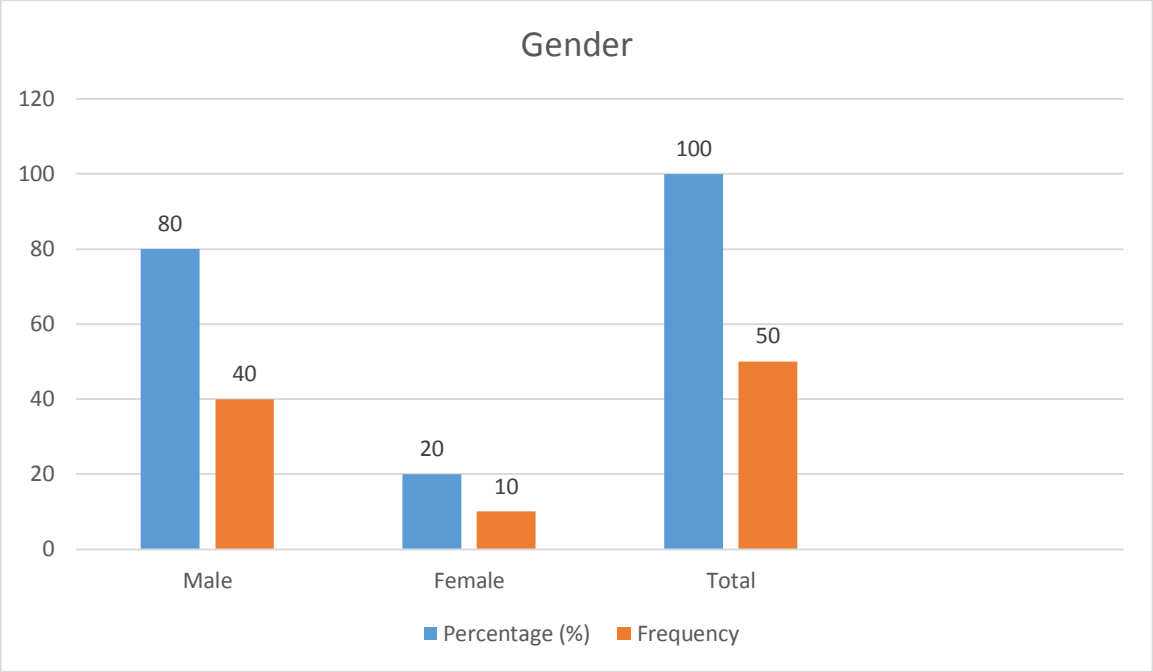
Table 1: Demographic Characteristics of Respondents

Variables	Frequency (n)	Percentage (%)
Gender		
Male	40	80.0
Female	10	20.0

Age		
20-29 years	4	8.0
30-39 years	24	48.0
40-49 years	15	30.0
50 years and above	7	14.0
Marital Status		
Single	20	40.0
Married	24	48.0
Divorced	6	12.0
Educational Status		
HND	3	6.0
First degree	15	30.0
Master's degree	16	32.0
Other	16	32.0
Type of Organizational Activity		
Manufacturing	35	70.0
Agriculture	9	18.0
Mining	6	12.0

Researcher field work, 2020.

FIG 5. A Bar Chart showing the Gender of respondents

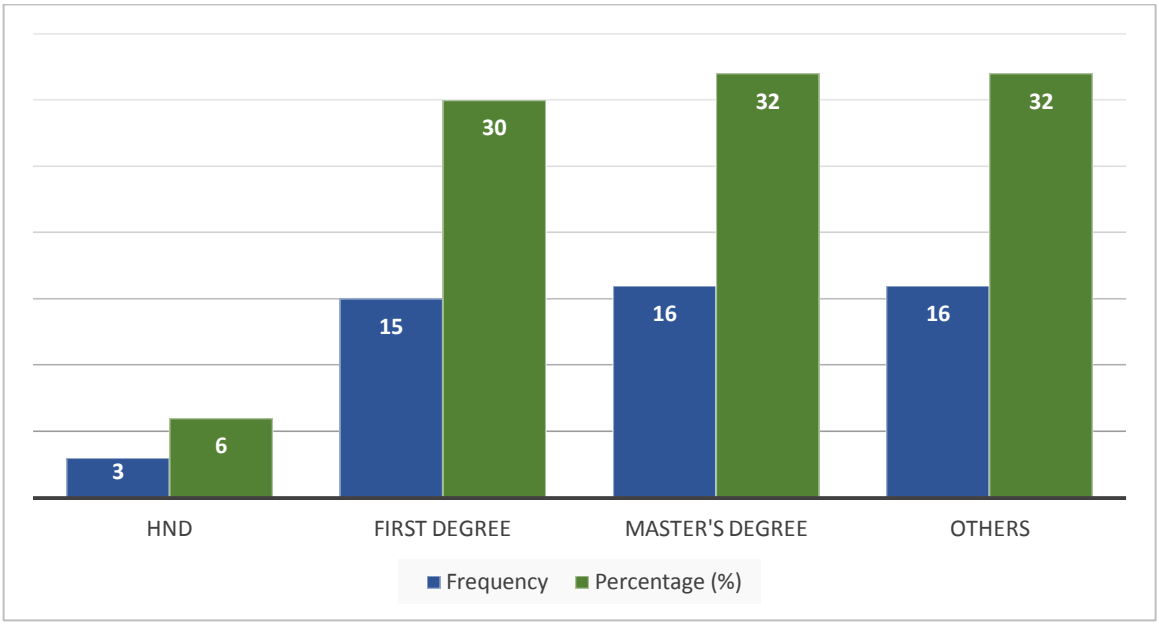


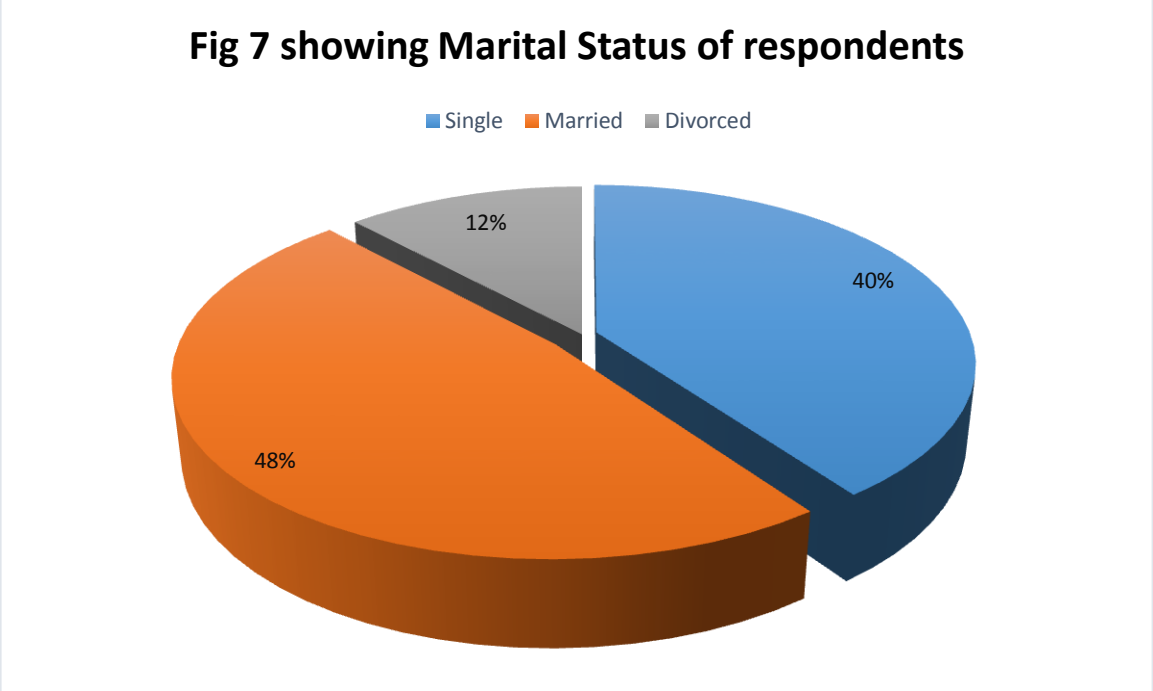
Researcher field work, 2020.

The study showed that 32.0% of the respondents had master's qualifications and 32.0% of the same participants suggested that they had other qualifications. Respondents who qualified first degree were 30.0%, and those who qualified with HND were 6.0%.This finding is indicative of the existence of high literacy rate within the study area. This calls for attention from government and various stakeholders within the metropolis.

It was also observed that 48.0% of those interviewed were married, while 40.0% were single. But 12.0% of those in question have divorced. The result is representative of the most possible rise in population in the research area in future, which is why social action policy should be prepared on time. This observation further indicates that the research field should cover social institutions such as schools and health services. Finally, the majority of respondents, 70%, are primarily engaged in manufacturing, while 18.0% are interested in agriculture, and only 12.0% in mines. The table and graphs below gives pictorial projection of the study.

Fig 6. Displaying educational status of respondents





Researcher field work, 2020.

3.2. Green Supply Chain Management and Practices

Table 2: Respondents knowledge of GSCM and practices

Variables	Frequency (n)	Percentage (%)
Do you understand GSC		
Yes	28	56.0
No	8	16.0
Maybe	14	28.0
Does your organization have any environmental friendly goals		
Yes	26	52.0
No	4	8.0
No idea	20	40.0
Environmental violations were avoided or reduced by GSCM		
Strongly disagree	3	6.0
Disagree	4	8.0
Neutral	15	30.0
Agree	18	36.0
Strongly agree	10	20.0
Organizations adopting GSCM helps to improve drastic climate change		
Disagree	2	4.0
Neutral	9	18.0
Agree	25	50.0
Strongly agree	14	28.0

Does your organization practice any green practices in SC		
Yes	13	26.0
No	8	16.0
Sometimes	26	52.0
No idea	3	6.0
Practicing GSC is beneficial		
Strongly disagree	1	2.0
Disagree	4	8.0
Neutral	13	26.0
Agree	20	40.0
Strongly agree	12	24.0

Researcher field work, 2020.

From the table above out of 50 respondents interviewed, 28 respondents said yes they understand the term GSC which represents 56.0%, whereas 8 respondents stated that they don't understand GSC representing 16.0% and 14 respondents which represents 28.0% stated that maybe they do understand GSC. It is observed that majority of the respondents 26 out of the 50 representing 52.0% answered yes their organizations have environmental friendly goals. Again, 4 respondents making up a percentage of 8.0% replied no, which means their organizations doesn't have any environmental friendly goals but, 20 respondents representing 40.0% had no idea if their organizations had any environmental friendly goals.

Furthermore, when respondents were asked whether GSCM has helped to prevent environmental violation charges, 6.0% of the respondents strongly disagreed, 8.0% of the respondents disagreed, and 30.0% of respondents neither disagreed nor

agreed, 36.0% which is the majority of respondent agreed and 20.0% of respondents strongly agreed. To know whether the drastic climate change improves by organizations adopting GSCM, no respondent strongly disagreed but 4.0% of the respondents disagreed while 50.0% agreed. Also, 28.0% strongly agreed but 18.0% neither disagreed nor agreed to this variable. To assess if organizations practice any green practices in the supply chain management, 26.0% of the respondents said yes, 16.0% of respondents said no, 6.0% had no idea and 52.0% which is majority of respondents answered sometimes. On how beneficial it is practicing GSCM, it was recorded that major number of the respondents, 40.0% of agreed that practicing GSCM is actually beneficial, whereas 8.0% of the respondents disagreed that it is beneficial. Only 2.0% of the respondents strongly disagreed and 24.0% strongly agreed. However, 26.0% of participants remained neutral, indicating that practicing GSCM is neither beneficial nor beneficial.

3.3. Impacts of GSC on Organizational Performances

Table 3: Respondents views of impacts of GSC

Variables	**Frequency (n)**	**Percentage (%)**
Organizational activities affects the ecological System, economy and firms		
Disagree	2	4.0

Neutral	10	20.0
Agree	19	38.0
Strongly agree	19	38.0
GSC has environmental impact on your organization performance		
Strongly disagree	2	4.0
Disagree	3	6.0
Neutral	15	30.0
Agree	20	40.0
Strongly agree	10	20
GSC has economic impact on your Organization performance		
Strongly disagree		
Disagree	3	6.0
Neutral	6	12.0
Agree	20	40.0
Strongly agree	12	24.0
Practicing GSC has operational impact On your organization performance	9	18.0
Strongly disagree		
Disagree	7	14.0
Neutral	5	10.0
Agree	28	56.0
Strongly agree	6	12.0
	4	8.0

Researcher field work, 2020.

From the table above out of 50 respondents interviewed, 2 respondents representing 4.0% disagreed that organizational activities affects the ecological system, economy and firms whiles 19 respondents representing 38.0% agreed. A number of 10 respondents representing 20.0% replied neutral. Also, 19 respondents which represents 38.0% strongly agreed.

Table 4. GSC environmental impact on organizational performance

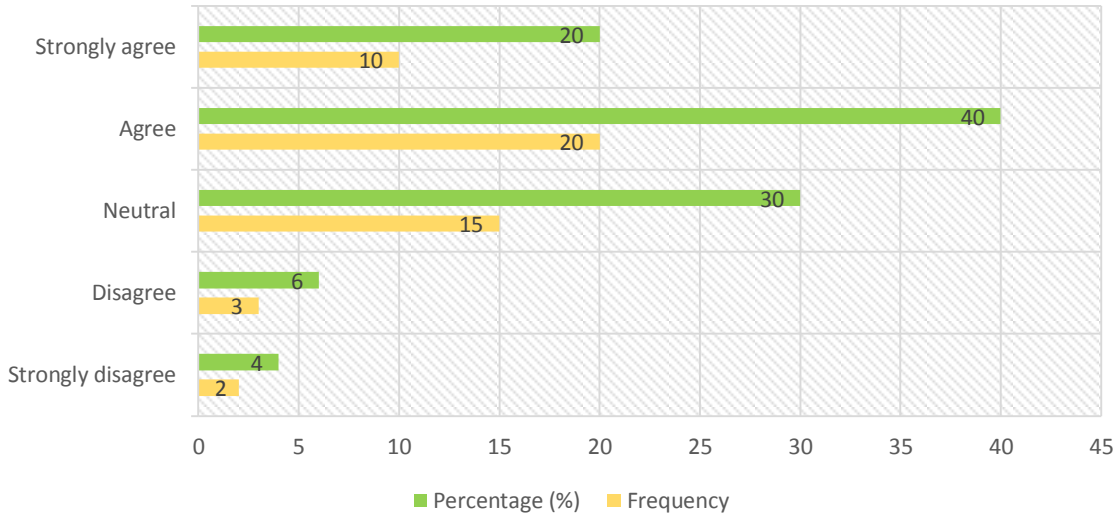
GSC impacts		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Clean water bodies	1	2.0	3.3	3.3
	Fertile grounds	2	4.0	6.7	10.0
	Healthy environment	2	4.0	6.7	16.7
	Improved climate	3	6.0	10.0	26.7
	Preservation of plant life	3	6.0	10.0	36.7
	Reduced air pollution	7	14.0	23.3	60.0
	Reduced land pollution	4	8.0	13.3	73.3
	Reduced traffic congestions	3	6.0	10.0	83.3
	Reduced water pollution	5	10.0	16.7	100.0
	Total	30	60.0	100.0	
Missing	99	20	40.0		
Total		50	100.0		

Researcher field work, 2020.

Deducing from the table above, 30 respondents which represents 60% agreed or strongly agreed that, GSC has impacts on the performance of organizations. Also, 20 respondents which represents 40% were not eligible to answer questions 13a because they strongly disagreed or had neutral opinion of questions 13. And this shows as missing on the table which was labelled 99 in SPSS.

The respondents who were eligible to reply this question stated various answers. Some of the responses are, reduced air pollution, reduced water pollution, reduced traffic congestions, reduced land pollution, preservation of flora and fauna, fertile ground, clean water bodies, etc. Out of 30 respondents, 7 respondents representing 14.0% which is the majority wrote reduced air pollution as an impact of GSC on organizational performance.

Fig 8. GSC has environmental impact on organization performance.



Researcher field work, 2020.

To understand if GSC has environmental impacts on an organization, majority of the respondents 20 representing 40.0% agreed, 10 respondents which represents 20.0% strongly agreed, only 2 respondents representing 4.0% strongly disagreed whereas 3 respondents representing 6.0% disagreed. A significant number of respondents 15 representing 30.0% neither agreed nor disagreed. The figure 8 above clearly demonstrates the responses.

Table 5. GSC economic impact on organizational performance

GSC impacts		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Decreased cost of purchasing material	3	6.0	14.3	14.3
	Decreased cost of storage	4	8.0	19.0	33.3
	Energy consumption decrease	3	6.0	14.3	47.6
	Increased in revenues	8	16.0	38.1	85.7
	Transportation cost reduction	3	6.0	14.3	100.0
	Total	21	42.0	100.0	
Missing	99	29	58.0		
Total		50	100.0		

Researcher field work, 2020.

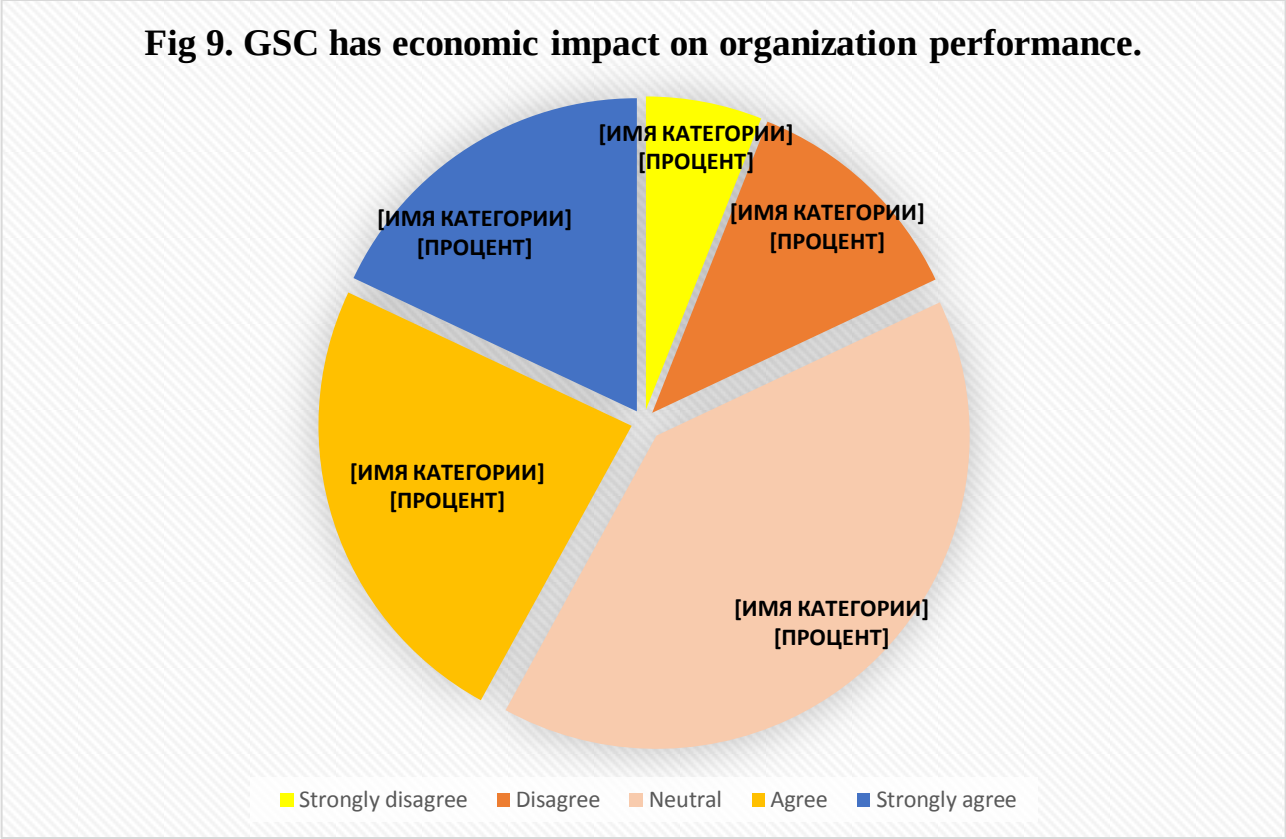
From the table above, 21 respondents, comprising 42.0%, agreed or strongly agreed that GSC would have an effect on the success of organizations. Also, 29

respondents comprising 58.0% were not able to answer question 14a because they either firmly disagreed or held a neutral opinion on question 14. And this is seen as missing from the table that was numbered 99 on the SPSS.

The participants who were entitled to answer this question gave different answers. Some of the responses include; decreased cost of purchasing material, increased in revenues, energy consumption decrease, decreased cost of storage, transportation cost reduction. Out of 21 respondents, 8 respondents representing 16.0%, the majority of whom identified increase in revenue as an effect of GSC on organizational efficiency.

To consider if GSC has economic impacts on the organization, 12 respondents representing 24.0% agreed, 9 respondents representing 18.0% strongly agreed, only 3 respondents representing 6.0% strongly disagreed, while 6 respondents representing 12.0% disagreed. However, 20 respondents which is the majority representing 40.0%, did not agree or disagree. The representation of the responses is clearly seen in Figure 9 below.

Fig 9. GSC has economic impact on organization performance.



Researcher field work, 2020.

Table 6. GSC operational impact on organizational performance

	GSC impacts	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Conservation of resources	1	2.0	10.0	10.0
	Improvement capacity utilization	1	2.0	10.0	20.0
	Increase in output	3	6.0	30.0	50.0

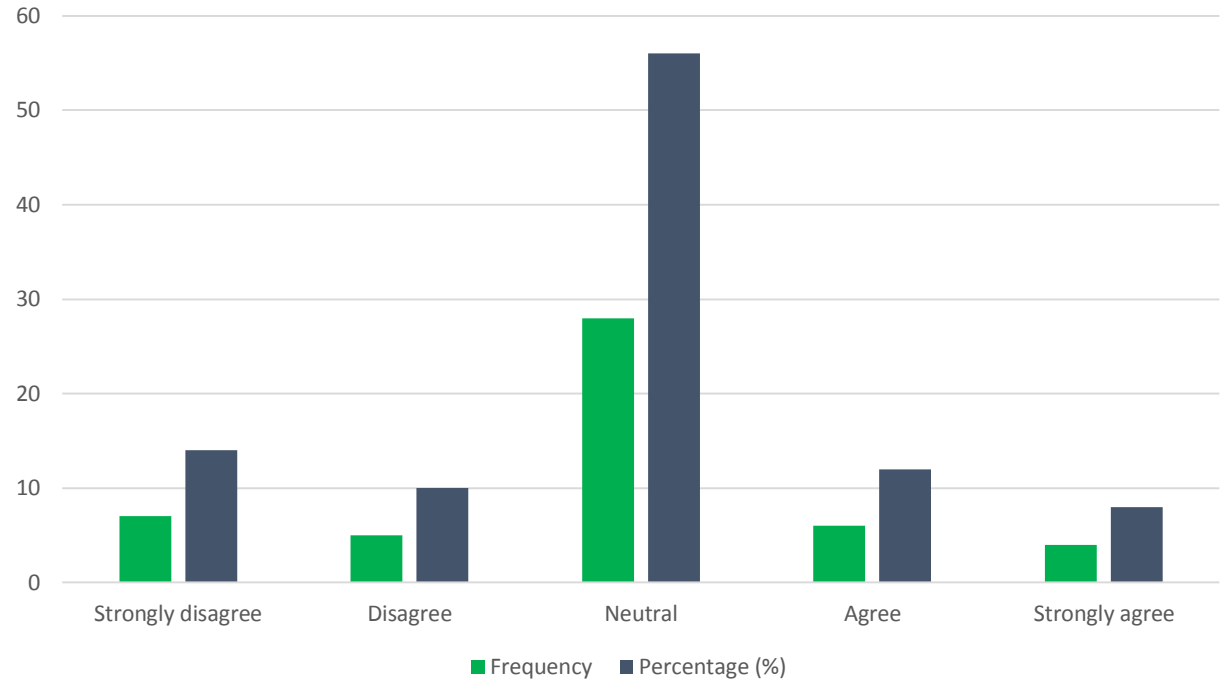
	Increased in efficiency	2	4.0	20.0	70.0
	Product Long time storage	3	6.0	30.0	100.0
	Total	10	20.0	100.0	
Missing	99	40	80.0		
Total		50	100.0		

In the above table, only 10 interviewer members decided that the GSC has an impact on organizations' output, comprising 20 percent of the participants. Also, the majority of 40 people who account for 80% did not answer questions 15a, since they deeply disagreed or hold a skeptical view on questions 15. And that indicated on the table as missing.

There were different responses from respondents who were required to answer this question. Some of the outcomes include; Increased in efficiency, improvement capacity utilization, increase in output, product long time storage, conservation of resources. Of the 30 respondents, the mass of which responded that increase in output and product long time storage were the impacts of GSC on organizational performance.

To acknowledge whether GSC has an economic impact on organizations, 6 respondents representing 12.0 percent agreed, 4 respondents representing 8.0 percent strongly agreed, 7 respondents representing 14.0 percent strongly disagreed, whiles 5 respondents representing 10.0 percent disagreed. However the majority of respondents 28, representing 56.0 percent, did not agree or disagree. The answers of the participants are clearly illustrated in Figure 10 below.

Fig 10. GSC has operational impact on organization



Researcher field work, 2020.

3.4. Green Supply Chain Measures Taken

Table 7. Measures taken to limit the consumption of water, electricity, gas and fuel during the manufacturing or disposal process.

	Frequency	Percentage %
Strongly disagree	1	2
Disagree	2	4
Neutral	7	14
Agree	21	42

Strongly Agree	19	38
Total	**50**	**100**

Researcher field work, 2020.

From the table above and the figure 11 below, out of 50 respondents, 1 respondent strongly disagreed representing 2.0%, 2 respondents disagreed representing 4.0%, 21 respondents agreed representing 42.0%, 19 respondents strongly agreed representing 38.0%, 7 respondents remained neutral representing 14.0%.

Fig 11. Measures to limit the consumption of water, electricity, gas and fuel during the manufacturing or disposal process.

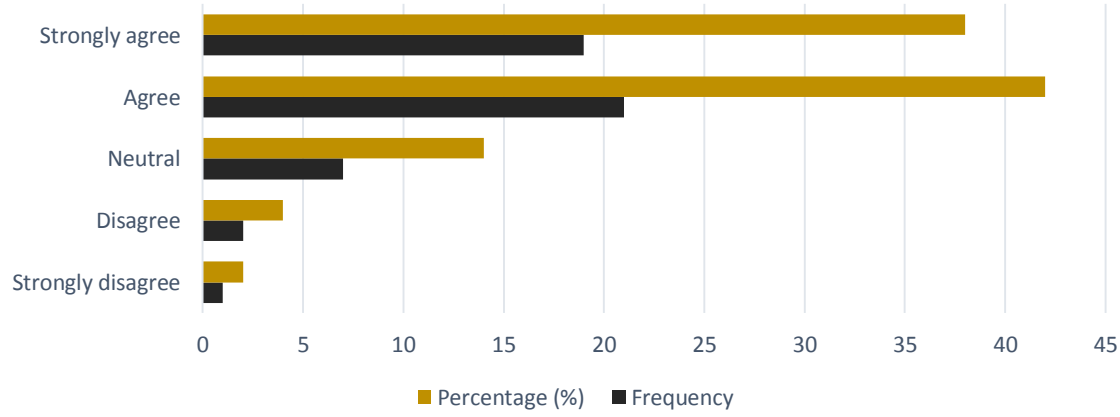


Table 8. Products or components have been recycled, reused and remanufactured by org.

	Frequency	**Percentage %**
Strongly disagree	3	6
Disagree	11	22
Neutral	14	28
Agree	17	34

Strongly Agree	5	10
Total	**50**	**100**

Researcher field work, 2020.

From the table above and the figure 12 below, out of 50 respondents interviewed, 3 respondents strongly disagreed representing 6.0%, 11 respondents disagreed representing 22.0%, 17 respondents agreed representing 34.0%, 5 respondents strongly agreed representing 10.0%, 14 respondents stating neutral represents 28.0%.

Table 9. Use of green technologies to conserve electricity, water and waste consumption.

	Frequency	**Percentage %**
Strongly disagree	5	10
Disagree	10	20
Neutral	16	32
Agree	13	26

Strongly Agree	6	12
Total	**50**	**100**

Researcher field work, 2020.

Of the 50 respondents, 5 respondents strongly disagreed, representing 10.0%, 10 respondents disagreed, representing 20.0%, 13 respondents accepted, representing 26.0%, 6 respondents strongly agreed, representing 12.0%, 16 respondents stayed impartial, representing 32.0%, from the table above and the figure 13 below.

FIG 13. USING GREEN TECHNOLOGIES TO CONSERVE ELECTRICITY, WATER AND WASTE CONSUMPTION.

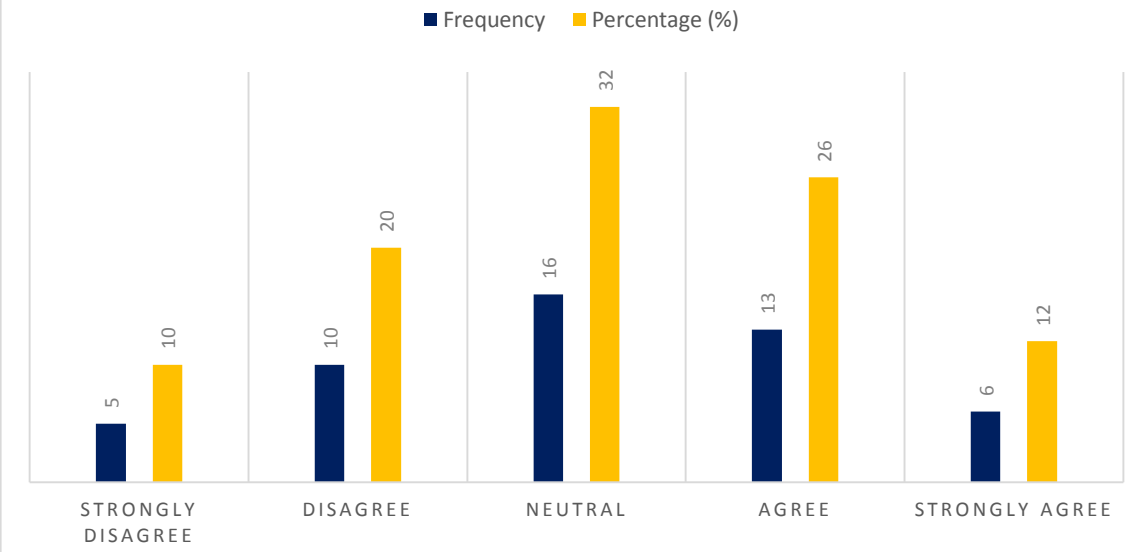


Table 10. Organization has redesigned production and operational processes to enhance environmental quality.

	Frequency	**Percentage %**
Strongly disagree	3	6
Disagree	11	22
Neutral	28	56
Agree	5	10

Strongly Agree	3	6
Total	**50**	**100**

Researcher field work, 2020.

Of the 50 participants, 3 respondents strongly disagreed, representing 6.0%, 11 respondents disagreed, representing 22.0%, 5 respondents agreed, representing 10.0%, 3 respondents strongly agreed, representing 6.0%, 28 respondents stayed neutral, representing 56.0%, from the table above and the figure 14 below.

FIG 14. ORGANIZATION HAS REDESIGNED PRODUCTION AND OPERATIONAL PROCESSES TO ENHANCE ENVIRONMENTAL QUALITY.

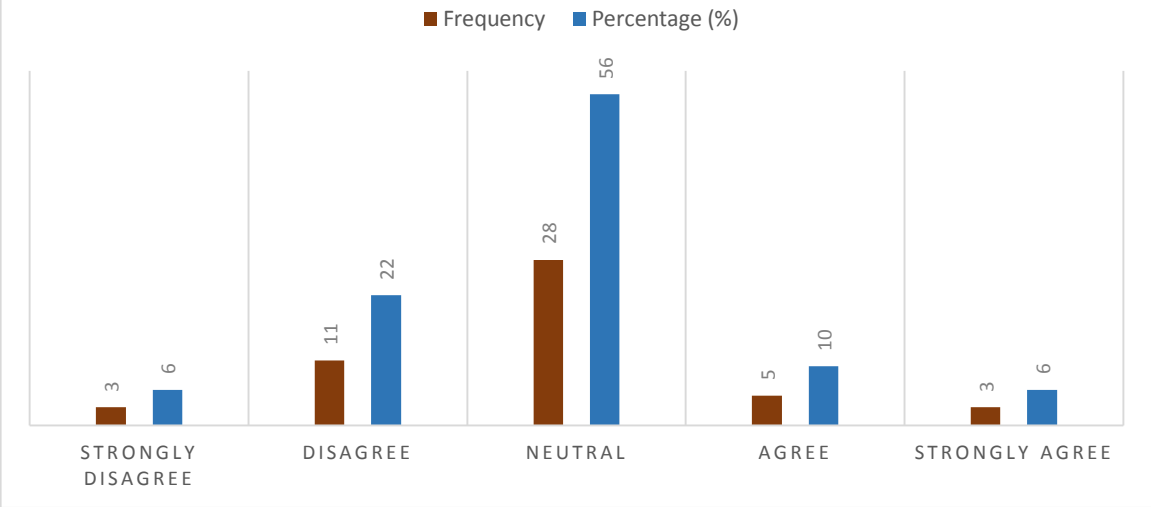


Table 11. Organization has redesigned and improved commodities or facilities in order to conform with environmental requirements pertaining to the environmental authorities' directives.

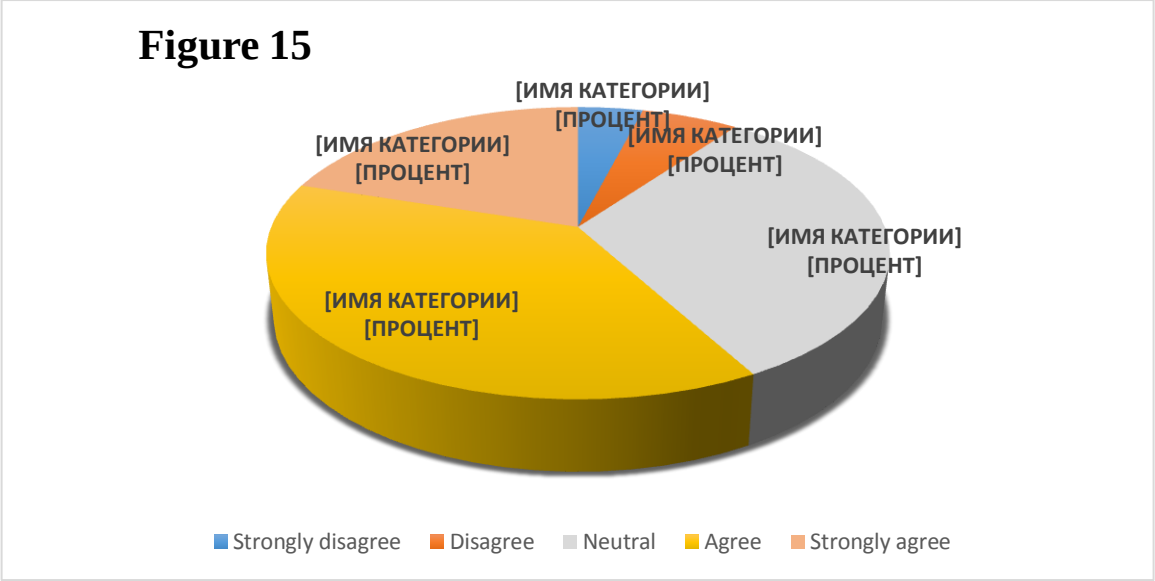
	Frequency	**Percentage %**
Strongly disagree	2	4
Disagree	3	6
Neutral	16	32

Agree	19	38
Strongly Agree	10	20
Total	**50**	**100**

Researcher field work, 2020.

The table above and the figure 15 below shows that, out of 50 respondents 2 respondents strongly disagreed representing 4.0%, 3 respondents disagreed representing 6.0%, 19 respondents agreed representing 38.0%, 10 respondents strongly agreed representing 20.0%, 16 respondents remained neutral representing 32.0%.

Figure 15



Conclusion

On the basis of the results of this particular study, the following conclusions can be drawn:

The majority of the population in the research area is highly educated and as such a large number understand what GSC means. It is also noticed that the majority of organizations have incorporated eco-friendly goals, which is why they have enabled deter charges for environmental infringements. However it is generally

acknowledged that the implementation of GSCM aims to improve ever-increasing extreme climate change, and it is often acknowledged that practicing GSC is helpful to organizations. However the results are clear that most organizations also do not pursue green practices in the SCM.

It has been identified that the diverse actions performed by the organization have an impact on the ecological system, the economy and businesses. It is also recognized that GSC has an environmental impact on organizational performance. Again it is appropriate to some degree to suggest that GSC has some economic impacts on organizational success even though the economic impacts are not substantial. The practice of GSC has no major impact on the organizational performances.

It has been shown that GSC has a substantial effect on the performance of an organization. Environmentally, GSC has significant impacts on organizational efficiency, such as reduced air pollution, reduced water pollution, reduced traffic congestion, reduced land pollution, conservation of flora and fauna, etc. Economically, it can also be said that GSC has an impact on organizational performance. Decreased cost of purchasing material, increased in revenues, energy consumption decrease, decreased cost of storage, transportation cost reduction are some of the GSC impacts on organizational efficiency. However the same cannot be said for the effect of GSC when it comes to the operational performance of an organization. While GSC has some impacts, such as increased performance, improved power usage, increased output, long-term product storage, conservation of resources, etc., its impacts are not very large.

Finally, it can necessarily be said that companies or organizations are taking steps to minimize the use of water, electricity, gas and fuel during the production or disposal process and that organizations are recycled, reused and remanufactured goods or components. Yet organizations are not using green technologies to save

electricity, water and pollution. This may be attributed to the essence of Africans who do not adjust easily to emerging technologies in the world. It is not clear if organizations have redesigned production and operational processes to enhance environmental efficiency, but it is obviously understood that organizations have often revamped and modified commodities or facilities in order to comply with the environmental criteria of the environmental authorities' directives. Compliance with these environmental guidelines from the authorities is meant to prevent the prosecution of environmental offences.

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APPENDIX

SUMY STATE UNIVERSITY, UKRAINE

DEPARTMENT OF ECONOMICS, ENTREPRENEURSHIP AND BUSINESS ADMINISTRATION

QUESTIONNAIRE FOR ORGANIZATIONS

Dear Respondent,

I am a student in the department of economics, entrepreneurship and business administration at Sumy State University, Ukraine. I am carrying out a study on **IMPACT OF GREEN SUPPLY CHAIN ON ORGANIZATIONAL PERFORMANCE** as a requirement for the award of a Master's degree certification. First of all, this particular study is of advantage to the organizations or firms who practice green supply to understand and know the implication of their actions on organizational performances. Also, the study will be of value, as it would help inform policy makers on how the environment and economy is being influenced by green practices of organizations. You have been chosen to take part in this study because of the value of your knowledge. The data will be handled with the highest privacy. Please feel free and answer all the questions truthfully. Thank you very much.

SECTION A: PERSONAL INFORMATION

1. Gender: Male [ ] Female [ ]

2. Age: 20-29 years [ ] 30-39 years [ ] 40-49 years [ ] 50 years and above [ ]

3. Educational Status: HND [ ] First degree [ ] Master's degree [ ] others [ ]

4. Marital Status: Single [ ] Married [ ] Divorced [ ]

5. What type of activities is your organization engaged in?

Manufacturing [ ]

Agriculture [ ]

Mining [ ]

Other Specify ……

SECTION B: GREEN SUPPLY CHAIN MANAGEMENT AND PRACTICES

6. Do you understand the term green supply chain?

Yes [ ] No [ ] Maybe [ ]

7. Does your organization have any environmental friendly goals?

Yes [ ] No [ ] No idea [ ]

8. Environmental violations/accidents were avoided or reduced by green Supply Chain Management.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

9. Organizations adopting GSCM helps to improve the drastic climate change.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

10. Does your organization practices any green practices in your supply chain management?

Yes [ ] No [ ] Sometimes [ ] No idea [ ]

11. Practicing green supply chain management comes with several benefit?

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

SECTION C: IMPACTS OF GSC ON ORGANIZATIONAL PERFORMANCES

12. Activities of your organization affects the ecological system, economy and firms operations.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

13. GSC has Environmental impact on your organization performance.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

13a. State any environmental impact on your organization if you do agree or strongly agree with question 13 above…….

14. GSC has Economic impact on your organization performance.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

14a. State any economic impact on your organization if you do agree or strongly agree with question 14 above…….

15. Practicing GSC has Operational impact on your organization performance.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

15a. State any operational impact on your organization if you do agree or strongly agree with question 15 above……

SECTION D: GREEN SUPPLY CHAIN MEASURES TAKEN

16. The company is taking measures to limit the consumption of water, electricity, gas and fuel during the manufacturing or disposal process.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

17. Products or components have been recycled, reused and remanufactured by your organization.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

18. This organization has made use of green technologies to conserve electricity, water and waste consumption.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

19. The organization has redesigned production and operational processes to enhance environmental quality.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]

20. The organization has redesigned and improved commodities or facilities in order to conform with environmental requirements pertaining to the environmental authorities' directives.

Strongly disagree [ ] Disagree [ ] Neutral [ ] Agree [ ] strongly agree [ ]