Drivers of Green Supply Chain Management: A Close-up Study

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Abstract

Green supply chain management (GSCM) is an important part of most production organisations in developed countries. Meanwhile, developing countries are yet to fully embrace the concept. This study, therefore, investigated the drivers of GSCM using a close-up approach in a leading manufacturing organisation in Nigeria with sustainability initiatives. One hundred and fifty-four questionnaires retrieved from the supply chain management team of the organisation were subjected to descriptive and inferential statistics such as mean score, standard deviation, and factor analysis. Based on the results of the analyses, that the drivers of GSCM in the organisation could be grouped as government-related, organisational-related, and societal-related drivers. The study concluded that synergy of the government, organisations, non-government organisations, and individual is important for achieving green supply chain practices in developing countries. It was recommended that training at all levels is essential to improve the awareness and importance of sustainable production to the environment.

1. Introduction

The increasing environmental degradation and industrial pollutions affecting the quality of life of people is a great concern (Sheu et al., 2005; Singhal, 2013). This justifies why consumers' preference for environment-friendly products is also increasing in recent decades (Anbumozhi and Kanada, 2005). This new development for environment-friendly products has spurred many organisations in developed countries to pay serious attention to environmental policies (Sezen and Çankaya, 2018). However, the availability of these policies has not reduced the damage caused by many organisations' products to the environment, especially in developing countries (Ojo et al., 2014; Sezen and Çankaya, 2018). It is worthy to note that, embracing such policies that encourage pro-environmental behaviour in the supply chain does not only boost an organisation's image, it also reduces waste, improve workers' health and general wellbeing of the populace (Mittal et al., 2013; Tan et al., 2018).

Green Supply Chain Management (GSCM) is an environmental improvement strategy or policy that integrates environmental concerns into organisational practices of supply chain management including reverse logistics (Sezen and Çankaya, 2018; Sarkis et al., 2011). This description implies that GSCM involves all parts of organisations and the surrounding community including the management of machine parts/components, raw materials management, and processes from supplier to manufacturers to final consumers (Sezen and Çankaya, 2018). Therefore, GSCM is an indispensable strategy to any production organisation in the quest to achieving environmental sustainability. This is composed of four major components, which include reverse logistics, distribution, manufacturing, and procurement (Ninlawan et al., 2010; Al-Maáitah, 2018). The implementation of GSCM in many production organisations had been acknowledged for process improvement, cost savings, and revenue enhancement (Ogunlela, 2018). It thus befits other production organisations especially in developing nations where there are limited resources and funds to integrate GSCM in strategic planning as well as daily business activities (Aneesa et al., 2015).

The importance of GSCM cannot be overemphasized. According to Ogunlena (2018) and Chan et al. (2012), GSCM possesses the capability to improve the performance of an organisation. At the national level, the green supply chain also enhances the competitive edge of a country's industrial sector and unravel new market opportunities for organisations (Shahriarpour and Tabriz, 2017). For example, the governments of Taiwan, Indonesia, the US, and Canada are willing to import any eco-friendly products from any country of the world (Mufidah et al, 2018). Despite the importance of GSCM to production organizations, the practice has not been fully embraced in Nigerian industries. Scholars revealed the existence of fundamental challenges such as lack of training, unsuitable tendering approaches, lack of knowledge, and so on restraining the practices in developing countries (Emuze and Smallwood, 2013; Olaniyan et al., 2015). Thus, the presence of these hindrances constitutes poor project performance, client dissatisfaction, and poor image of the industries (Ojo et al., 2014). Since the aforementioned challenges have been a major concern to environmental sustainability, and quality of life; it implies that the need to identify drivers that could aid swift implementation and practice of GSCM in Nigerian industries becomes imperative. One of the leading manufacturing organisation in Nigeria and Africa at large has been recognized for its sustainable initiatives and the quest to foster 'green' practice (Akinyoade and Uche, 2016; Manchanda et al., 2020). The commitment of the organisation to 'green' practices contributed to numerous awards received in recent years (Africanews, 2019), meanwhile, such green initiatives and recognitions are rare in other manufacturing organisations. Therefore, it is important to investigate the drivers of GSCM in this organisation with a view of drawing scientific inferences for future studies and recommendations for other production organisations in developing countries.

In the other sections of this paper, a comprehensive literature review was conducted to identify the drivers of GSCM. A questionnaire was developed with these drivers to elicit the opinions of the supply chain management team of a leading manufacturing organisation in Nigeria. The research methodology explicitly described the close-up research approach employed for the study. Several statistical analyses, namely, mean score, standard deviation, factor analysis, and reliability test were conducted. The research findings which would contribute to the body of knowledge were discussed. Practical recommendations and conclusions were also drawn from the study.

2. Literature Review

2.1 Green Supply Chain Management

The concept of GSCM has could be traced to the first United Nations Conference on Human Environment in 1972, or few years to the conference (Fiorini et al., 2018; Sarkis et al., 2011). Meanwhile, the practice of GSCM can be dated to the 1990s, and academic debates on it started in the 2000s (Fahimnia et al., 2015; Srivastava, 2007). The swift embracement of GSCM especially in developed countries was due to the health consequences of different industrial pollutants on their environment and citizens (Asif et al., 2020). This led to several ameliorative measures such as transferring hazardous industries and technologies to developing countries (Copeland and Taylor, 2004; Antweiler et al., 2001). This generated barrage of debates and hypotheses viz pollution haven hypothesis, pollution halo hypothesis among scholars and practitioners (Wang et al., 2019; Baek, 2016; Tamazian et al., 2009). However, it is undeniable that developed countries have devised means of achieving environmental performance and further conceptualized GSCM into their industrial practices (Zhu et al., 2013; Yu et al., 2014; Eltayeb et al., 2011).

Interestingly, since the introduction of the GSCM concept, there is no universal definition for it, meanwhile, the various definitions has some common themes, namely, 'environmental management', 'green procurement', and 'sustainability' (Tseng et al., 2019; Singh and Trivedi, 2016; Gandhi et al., 2015). According to Sarkis et al (2011), GSCM can be defined as the integration of environmental concern into organisational practices for sustainability with the consideration to reverse logistics. GSCM is also described as an integration of sustainable practices into the design, manufacturing, material management, distribution, and end-of-life management of products (Dadhich et al., 2015; Wibowo et al., 2018). Thus, GSCM connotes the practice that considers environmental principle in the lifecycle of a product with great importance in achieving environmental performance, risk control, meeting market expectations, etc. (Malviya et al., 2015; Amemba et al., 2013; Zhu et al., 2012).

2.2 Drivers of Green Supply Chain Management

There are certain drivers of GSCM in production organisations. In a study conducted in Taiwan, the drivers of GSCM includes environmental collaboration with suppliers, desire to satisfy customers' need, the quest to improve performance in the organisation (Wu et al., 2011). The study concluded that the efforts of the organisation play a significant role in embracing 'green practices. It is worthy to note that reference was not made to government policy and regulation in the assessment, meanwhile, Diabat and Govindan (2011) considered government regulation as the most critical driver of GSCM through interpretive structural model conducted. The construct of drivers of GSCM in Germany revealed that collaboration with suppliers and commitment to environmental performance are determinants of green purchasing (Large and Thomsen, 2011). Interestingly, Wang et al (2018) simply grouped the drivers of GSCM into customer and cost drivers. This was to capture the drivers into external or internal green practices that lead to environmental performance. On the part of Brik et al (2013), the six drivers of GSCM investigated in Dubai also hovers around internal and external drivers. Thus, this confirms the submissions in different scholarly articles that the drivers of environmental performance initiatives could be categorized into external and internal (Longoni et al., 2018; Zeng et al., 2011)

The desire to engage in international trade transactions is an enabler of green productions (Amakom, 2012; Turker and Altuntas, 2014). When goods produced in one country are moved to other countries as well as purchased by the residents of the countries is referred to as export. Export is the oldest forms of trade and industry transference that take place on a large scale among countries and makes establishments that distribute into foreign markets to expand innovative understanding and involvement (Hessels and Stel, 2009; Wieland, 2021). Export gives room for unearthing fresh technologies, and promotional practices with foreign players. Export contributes significantly to an economy (Amakom, 2012). Thus, the desire to engage in the exportation of products propels organisations to engage in productions that meet international standards (Wood et al., 2015; Weiss and

Jacobson, 2000). Import, on the other hand, is another important aspect of international trade. It is worthy to note that the reasons why companies export products and services include: to increase sales and incomes; build new markets or enlarge surviving ones, as well as create a chance to capture important international market segment (Pär, and Nan, 2004; Brooks et al., 2018).

The provision of regulatory policy on GSCM on the part of the government is regarded as a starting point in most cases and an essential part in ensuring 'green' practice (Khan and Yu, 2020; Niemann et al., 2016). Regulations mean a set of rules and code of practice that governs or dictates what is considered to be legitimate or illegitimate (Ostrom, 2010; Daliu et al., 2019). Regulations often comprised forms of penalties for defaulters to ensure standardization and equal treatment of business transactions. In the context of this study, regulations refer to a compendium of instruction issued by the government to ensure a safe and favorable environment for the residents of a particular country (Amakom, 2012). Previous studies proved that there is a correlation between governmental regulations, green buying objectives, and environmental performance (Thomas and Littlewood, 2010; Khan et al., 2019a). For instance, countries of the world like America and Denmark have on many occasions adopted market-based methods, voluntarism as well as other plain policy resourcefulness like incorporation; conglomerates; membership; purposeful elegances of decision-making; erudition; collaboration, and New Environmental Governance (NEG) to control environmental dreadful conditions (Khan et al., 2020; Holley, 2017). Therefore, enforcement of the regulations is important to achieve the aim of formulating the policy (Koski, 2006; Adeniyi et al., 2020).

Formulating green strategies in an organization complements the success of an organization, enhances its operations, or augments its asset approaches (Holley, 2017). The green strategy essentially assists an organization ineffective decision-making capable of progressive influence on the environment (Olson, 2008; Head, 2014). Therefore, promoting green principles is essential, thus stimulate ideologies that make up green strategies and operative decisions centered on firm commercial soundness and sustainable development (Insch, 2011; Khan et al., 2019b). The kind of activities being undertaken in an industry is also a determinant of GSCM. This encompasses material management, storing, conservation decisions; management activities or dumping strategies, etc. (Teshome and Thakur, 2017; Olson, 2008). Besides, discarded material, or by-products; material management locations; waste sites, and the likes could also be considered (Glaser, 2006; Grant et al., 2017).

Consumers' awareness is also significant in green buying decision-making practices as well as consumers' buying purpose. This is also referred to as 'Eco literacy'. As long as an individual is aware of the environmental damages of a particular product, a negative perception about such product and even the organization, as a whole is expressed (Ayodele et al., 2017). Therefore, enlightening the consumer has been suggested as a suitable way to maintaining reliability in terms of being environmentally responsive (Olamuyi, 2012; Gupta and Palsule-Desai, 2011). Environmental awareness has an uninterrupted influence on customers' preparedness to pay for a green product (Muhammad et al., 2014). Thus, the awareness helps to enhance the quality of life of people and their immediate environment.

The desire of an organisation to possess a green brand image as a means to enhance organisational reputation and market strategy cannot be undermined (Olamuyi, 2012). Green brand development emphasizes end-of-pipe technology where firms are conscious about environmental matters through the process of production as well as product design (Othman, 2011). Thus, a firm with a green brand promotes a reduction in the usage of non-repeatable resources and toxic materials. The use of a renewable resource is very important because it helps to sustain the brand among its competitive brands (Rizwan et al., 2013). Therefore, the development of eco-friendly goods is imperative (Olamuyi, 2012).

The need to involve the societal organisation in the campaign for sustainable consumption and production is very important. This organisation focuses on encouraging values such as global accountability, community-based economics, as well as sustainability. This is why Non-Governmental Organizations (NGOs) across the globe are making frantic efforts to educate and implement green strategies in their administrative platforms (Rizwan, et al., 2013). However, green movement activism embraces a broad collection of individuals as well as organizations working with systematic, collective, eco-friendly, and political grounds to address the worries of ecology. These individuals and organizations according to Payne (1996) are recognized communally as a fragment of the ecological or green movement. Thus, it could be said that green movement activists may not possess a political alliance or agenda but, pursue solutions to environmental problems.

Finally, a company's initiative and desire to improve its products through a mutual relationship with its customers via responsibility in the environment where it operates is important (Jo et al., 2015; Tanner and Wölfing, 2003). This kind of initiative according to Falck and Heblich (2007) may be a section of the company's vision for the future and this is what describes the obligations of the company to the members of the environment, which is termed 'Corporate Social Responsibility'. A company's initiative is a task to find a lasting solution to an in-house problem or to satisfy their customers' needs.

3. Research Methodology

3.1 Close-up Research Approach

A close-up study entails investigating issues related to an organisation where the investigator(s) is employed (Alvesson, 2003). A close-up study is also referred to as 'research in your own organisation' in which the researcher(s) is an employee with enthusiasm and commitment to the establishment (Coghlan, 2019; Brannick and Coghlan, 2007). This method helps researchers to explore 'understanding in use', rather than 'reconstructed understanding' (Coghlan, 2019). In other words, a close-up study avails the researcher the opportunity to inquire into the motivations behind a particular practice in an organisation or the efforts behind an organisational breakthrough or success. The possible disadvantages of collegial relationship between the researchers and the target respondents in data collection have been debated by scholars (McDermid et al., 2014; Taylor, 2011; Gunasekara, 2007; Manderson et al., 2006), however, the negative circumstances could be abated if professionalism, trust, and confidentiality could be guaranteed by the respondents (McDermid et al., 2014). Thus, it is important to employ a data collection method that helps to maintain a high level of confidentiality between the researchers and respondents for this study.

3.2 Sample

Purposive sampling was adopted for investigation in this study to ensure homogeneity of the sample and control the quality of data collection (Etikan et al., 2016; Sharma, 2017). The target respondents consist of purchasing officers, logistic officers, warehouse staff, sales staff, outbound and inbound staff, departmental heads, directors, and management staff of Dangote Group of companies. Dangote group of companies is a major manufacturing conglomerate that consistently provides the basic needs of the populace in Nigeria and Africa at large (Akinyoade and Uche, 2016). The group of companies is deeply committed to creating a world-class, multi-national manufacturing company based on its 7-sustainability pillars including institutional, operational, financial, economic, environmental, social, and cultural (Sustainable Report, 2018). The choice of the Dangote group of companies is based on the sustainability vision of the organisation, training on the GSCM scheme, and commitment to upholding green practices. The respondents cut across all business units of the company including cement production, sugar refinery, salt refinery, steel mill, food and beverages, fertilizer production, oil refinery, etc. in Nigeria.

3.3 Data Collection

A questionnaire survey was designed to investigate the drivers of GSCM among the supply chain management team of Dangote Group of companies in Nigeria. The choice of a questionnaire in this study was based on the need to maintain anonymity, reduce the relational influence that may distort the judgment of the respondents, and obtained a high response rate. A copy of the questionnaire designed consisted of two sections; the first section contained questions to elicit background information of the respondents, and the second section comprised of drivers of GSCM on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was administered to 500 respondents via their email addresses retrieved from the System Application and Product (SAP) in the data processing interphase of the Dangote Group of companies. Of these, 154 copies of questionnaires were returned, giving a response rate of 30.8 percent. The questionnaires retrieved were subjected to both descriptive and inferential statistics, namely, mean score, standard deviation (SD), and factor analysis of Statistical Package for Social Sciences (SPSS) version 25.

The respondents comprised members of the supply chain team of oil refinery (37.7 percent), cement production (9.7 percent), food and beverages (7.1 percent), flour mill (5.8 percent), salt refinery (6.5 percent), and other business units (33.2 percent). Twenty-five (16.9 percent) of the respondents were junior staff, senior staff (44.8 percent), manager (30.5 percent), and directors (7.8 percent). Concerning the academic qualification of the respondents, 2.6 percent had senior certificates, 1.3 percent had diploma certificates,

47.4% had bachelor degrees, 46.1% had master degrees, and 2.6% had doctorate degrees. The background information shows that the respondents possessed academic and professional qualifications to achieve the aim of this study.

4. Analysis And Results

Table 1 shows the mean score of the drivers of supply chain management. 'federal government environmental regulations (D1)' and 'state environmental regulation (D2)' ranked first and second with a mean score of 4.19 and 4.16 respectively. The third-ranked driver is 'company's green initiative (D3)' with a mean score of 4.11, while 'establishing company's green image (D4) ranked fourth with a mean score of 4.04. The driver with the least mean score is 'green movement activism by non-government organisations (D10)'. The mean scores of all the drivers are above three-fifths of the adopted 5-point Likert scale for the study. This implies that all the drivers were significantly agreed upon by the respondents (Harada et al., 2015), and thus, could be termed 'significant' to enhance GSCM practice. The standard deviations of all the drivers are approximately 1.00. In fact, nine of the drivers have standard deviations that are less than one. This connotes that the variability of the dataset of this study is minimal (Oke and Aghimien, 2018; Ojo and Ogunsemi, 2019); therefore, there is considerable consensus on the drivers among the respondents.

Table 1: Mean Score of Drivers of Green Supply Chain Management

Codes	Drivers	Mean	S.D.	Rank
D1	Federal government environmental regulations	4.19	0.87	1
D2	State government support for enforcement	4.16	0.91	2
D3	Company's green initiatives	4.11	0.90	3
D4	Establishing a company's green image	4.04	0.92	4
D5	Industrial professional group activities	3.99	0.86	5
D6	Desire to engage in the exportation of products	3.98	0.95	6
D7	Consumers' environmental awareness	3.96	0.96	7
D8	Competitors' green strategies	3.94	0.88	8
D9	Supplier's advances in developing environmentally friendly goods	3.91	0.95	9
D10	Green movement activism by non-government organisations	3.71	1.02	10

Note: S.D. = Standard deviation

4.1 Factor Analysis

Factor analysis was conducted to group the drivers of GSCM into a smaller and manageable size for ease of discussion. According to Shen and Liu (2003), conducting an adequacy test of the dataset is the first step to be considered in factor analysis. Therefore, for this study, Kaiser-Mayer-Olkin (KMO) of 0.884 at a significant level of 0.000 was obtained, and this shows that Bartlett's Test of Sphericity for correlation adequacy between the variables was highly significant (see Table 2). The p-value obtained, which is < 0.05 at a degree of freedom (df) of 45 and chi-square value of 1019.869 implies that all the barriers will significantly correlate at a 5% level and therefore, exploratory factor analysis is appropriate.

Table 2: Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.884
Bartlett's Test of Sphericity	Approx. Chi-Square	1019.869
	Df	45
	Sig.	0.000

The drivers of GSCM were factor analysed by varimax rotation (eigenvalue – 1 cut off). This is important to establish the principal components that constitute each factor (Field, 2005). In this analysis, the drivers with factor loading greater than 0.5 were considered satisfactory (Pallant, 2011). Based on the results of the factor analysis in Table 3, the factor loading of the drivers ranges from 0.594 to 0.857, and three-factor groupings were generated from the analysis. The reliability of the grouping of the dataset was also checked with Cronbach's alpha (α) value for internal consistency (Kothari, 2017). The α values generated were 0.865, 0.775, and 0.904 respectively. These α values are well above 0.6 and thus, they can be considered satisfactory (Hair et al., 2014). Table 3 shows that two drivers, i.e., D1 and D2 were grouped into the first component of the factor analysis; three drivers (D5, D8, and D6) grouped into the second component; while D9, D10, D4, D7, and D3 grouped into the last component.

Table 3: Factor Analysis of Drivers of Green Supply Chain Management

	Drivers	**Component**			**Alpha**
Codes		**1**	**2**	**3**	
D1	Federal government environmental regulations	0.857			0.865
D2	State government support for enforcement	0.835			
D5	Industrial professional group activities		0.804		0.775
D8	Competitors' green strategies		0.756		
D6	Desire to engage in the exportation of products		0.698		
D9	Supplier's advances in developing environmentally friendly goods			0.794	0.904
D10	Green movement activism by non-government organisations			0.791	
D4	Establishing a company's green image			0.711	
D7	Consumers' environmental awareness			0.635	
D3	Company's green initiatives			0.594	

5. Discussion

The results of the factor analysis conducted show that three major groupings could be used to explain the drivers of GSCM. Based on the analysis, 'federal government environmental regulations (D1)', and 'State government support for enforcement (D2)' were referred to as *"Government-related driver"*, 'industrial professional group activities (D5), 'competitors' green strategies (D8), and 'desire to engage in the exportation of products (D6)' was termed *"Organisational-related driver";* while 'supplier's advances in developing environmentally friendly goods (D9)', 'green movement activism by non-government organisations (D10), 'establishing a company's green image (D4)', 'consumers' environmental awareness (D7), and 'company's green initiatives (D3) were named *"Societal-related driver"*. The names of the factors were based on the judgment of the authors, as this agrees with the submission of Henson and Roberts (2006) that, there is no specific scientific procedure to be followed in naming the groupings of items in factor analysis. However, the given names to the factors in this study largely represent the items that constitute the factors.

5.1 Government-related Driver

The two drivers (i.e., D1 and D2) that denote items for describing government-related driver were grouped together in the analysis. In Nigeria, there are three tiers of government, namely, the federal government, the state government, and the local government. The federal and the state governments possess most of the powers and authorities in the country, and with this, regulations of industrial actions are being carried out. The local government often acts on the directives of the state government (Adewale, 2009; Adeniyi et al., 2020); thus, it could be inferred that state government is sufficient for discussion in this study since the local government act on the interest and delegations from the state government. This analysis shows that the regulation of the federal government coupled with enforcement actions on the part of the state government plays a fundamental role in GSCM in the manufacturing industry. It, therefore, implies that the collaboration of government at all levels is significant to ensuring sustainable consumption and development of a country. This finding corroborates previous studies that the provision of rules and regulations that meet the green supply chain is mostly initiated by the government (Khan et al., 2018; Ilyas et al., 2020). Besides, the role of government is not limited to her immediate country, an international tie that aids green consumption and production can also be achieved through decisive efforts of the government at the national level (Khan and Yu, 2020; Stevens, 2010). Therefore, the availability of policies and documented strategies helps to control the impacts of production organisations on the environment, and the competitiveness of organisation.

It is worthy to note that the enforcement on the part of the state government also dovetailed into government-related driver. This implies that the availability of environmental regulation without enforcement strategies could lead to environmental non-performance. This finding also agrees with the study of Dawkins et al (2019) that shows the importance of the lowest tier of government in ensuring GSCM. In reality, the local government authorities often have direct access to production organisations, and also, in situations where there are deficiencies in the supply chain, the local and regional residents are the most affected. Therefore, efforts of government at all tiers are critical to achieving a green supply chain in production organisations and other sectors of the country at large. It is therefore expected that adequate collaboration between governments should be harnessed to encourage production organisations in GSCM practices. Besides, enforcement of stipulated regulations and processes is essential to attain environmental performance and sustainable practice in developing countries.

5.2 Organisational-related Driver

The drivers, i.e., D5, D8, and D6 that constitute ‘organisational-related driver’ largely represent items that connotes that motivating force at organisation level to practicing GSCM. Thus, the organisation where productions take place is an important determinant of sustainability in a country. The desire of a manufacturing organisation in extending its services beyond the immediate country could lead to green initiatives. For example, developed countries' commitment to green practices has been established, therefore, any imported goods into such country must meet the stipulated ‘green’ requirement. Therefore, the producing organisation could engage in training of staff, and international collaborations that would help to gain entry into the mainstream market of other nations. Previous studies revealed that training equips employees with the need to possess pro-environmental behaviour, and this could be a starting point to GSCM in developing economies (Khan et al., 2019b; Owolana and Booth, 2016). Besides, in a situation where an organisation noticed that competitors have started exportation of goods and services; this could propel devising other sustainable methods in the production process. Therefore, training would help to ameliorate knowledge deficiencies which is a critical impediment to sustainability (Ojo et al., 2021).

The analysis also shows that ‘industrial professional group activities (D5)’ underscore organisational-related driver. In real practice, industrial professional groups play active roles in various forms. Firstly, in-house training and education could be an industrial professionals’ scheme to ensure that all human resources in production organisations are aware of the need for sustainability and the inimical effect on human and the ecosystem. Secondly, commitment of top manufacturing organisations could be assured if industrial professional groups possess pro-environmental behaviour. Most times, industrial professional group possess cordial relationships with top management in organisation. This is evident in many professional programmes being sponsored by leading organisations in the country. Therefore, the need for ‘green’ practices could be easily communicated to managers, and the enforcement would also be easier at organisational level. Thus, public campaigns and regulations by the government would yield no result without the involvement and commitment of managers of organisations (Lin et al., 2015; Sajjad et al., 2015). Lastly,

industrial professional group could be a mouthpiece for the government or the middleman between the government, production organisations, and individual employee.

5.3 Societal-related Driver

The results of the analysis reveal that five drivers that majorly constitute the societal-related drivers are grouped together. This implies that society also plays a vital role in the GSCM movement. The society consists of individual persons, suppliers, consumers, and non-governmental associations in this study. First, the shift from traditional procurement patterns to eco-friendly methods could induce innovativeness in organisations, i.e., suppliers. Also, environmental consciousness campaigns that communicate the essence of sustainability to citizens through different communication channels are important. According to Geng et al (2017), global awareness of the environmental impact of the manufacturing process on the environment is an important feat in the green supply chain movement. The awareness in this scenario propelled even organisations to devise means of producing environmentally friendly products, and also promote the image of such organisation. This also implies that communication plays a central role in identifying the present situation of an organisation or community concerning GSCM. Therefore, collaborative effort between all members of the society cannot be undermined in the effort to promote sustainability and green production (Khan et al., 2020; Yenipazarli et al., 2017; Brockhaus et al., 2016).

6. The Implications Of The Study

This study investigated the drivers of GSCM in a Nigeria's production organisation. An exploratory factor analysis was conducted to group the drivers of GSCM into manageable sizes namely, *government-related driver,organisation-related driver,* and *societal-related driver*. The outcome of the analysis shows that GSCM entails mutual efforts of government at all tiers is essential to foster GSCM practice in Nigeria. Therefore, it is recommended that the federal, state, and local governments in Nigeria establish an agency that majorly investigates production organisational practices to ensure compliance with government regulations. The collaboration between the government would help to have one voice in communicating the environmental demand and requirements to all production organisations. The government should also make public enlightenment campaign to create awareness of the importance of GSCM and solicit collaborative synergy of all members of the society. The government should provide all necessary assistance and supports to production organisations such as the provision of training at a subsidized rate for micro, small, and medium enterprises. Finally, the government should ensure that appropriate sanction is given to any organisation that default to the requirements of the government.

The study also revealed that organisations also play important role in enhancing GSCM practices. It is therefore recommended that the top management officials in manufacturing organisations establish schemes, namely, training, workshop, seminars, practicum at organisational level to educate their employees on GSCM and the importance. Such scheme would not only create awareness of eco-friendly practices, but it could also stimulate intuitive reasoning and creativity in the employees. It is also recommended that top management officials attend international conferences regularly to familiarize themselves with innovative supply chain development in the industry. Besides, a substantial amount of money should be set aside in organisations for subscription to scholarly articles to get updates on strategies for improving environmental performance in the industry. The large production organisation could also contribute to training and educating the micro, small, and medium enterprises in Nigeria. This could be in form of corporate social responsibility, i.e., a means of giving back to society through international networks and expertise in their organisations.

The role of society is also in GSCM practice as shown in this study. Therefore, it is recommended that the society works hand-in-hand with the government, enforcement agents, and non-government organisations to ensure compliance of organisations to green practices. Society must be reminded that the environment and human beings are the ones to suffer any inimical actions from organisation activities. Finally, the need for sustainability has turned the whole world into a common market. Therefore, collaborative efforts of all and sundry in society are important to have a habitable environment. It is therefore recommended for Dangote group of companies takes a leading role in training other production organisations in Nigeria and other African countries where the company is established the essence of GSCM. This would go a long way to encourage ‘green’ practices in production organisations, and the sustainability of the environment could be accomplished as well.

7. Conclusions

This study investigated drivers of GSCM with a close-up approach in a leading manufacturing organisation in Nigeria and Africa at large. A questionnaire survey was designed and administered to supply chain officers in all the business units of the Dangote Group of Companies in Nigeria. The survey approach was adopted to ensure confidentiality, and retrieve large number of responses necessary to draw conclusions. One hundred and fifty-four questionnaires retrieved were subjected to statistical analysis, namely, mean score, standard deviation, and factor analysis. The results of the factor analysis conducted show that three components could be used to categorize the drivers of GSCM. They include government-related, organizational-related, and societal-related drivers. It is worthy of note the result of the analysis implies that GSCM requires the collaboration of government, production organisations, non-governmental organisations, and the final consumers. Thus, achieving a green supply chain in developing countries requires mutual synergy amongst all stakeholders. Based on the result of this study, it is recommended that training and public awareness campaigns should be provided at all levels to educate society on the importance of GSCM. The training could be sponsored by the government at a subsidized rate to encourage the involvement of micro, small and medium enterprises. Other organisations in developing countries could also learn from the outcome of such a study to leverage the importance of practicing GSCM in production organisations. While the results of the analyses conducted in this study are valid and reliable in this context, qualitative data could also be collected in future studies to obtain hands-on drivers of GSCM from the board of directors of production organisations in Nigeria. This would be necessary to achieve triangulation on the dataset. In addition, other production organisations could be investigated to check if their opinions align with that of Dangote group of companies or not.

Declarations

Ethics Approval and Consent to Participate

This research involved human participants to fill a structured questionnaire. The questionnaire of the study does not contain any implicating item to the image of the institution where the research was conducted, therefore, ethics approval of the organisation was waived. The submitted work is original and have not been published elsewhere in any form neither is it under consideration for publication elsewhere.

The research instrument was prepared in English language because it is the official language of the country of study and it is expected that respondents by their virtue of training and experience, possess the required knowledge of the language to respond accordingly. In preparing the questionnaire, a cover letter was provided to intimate respondents on the purpose of the study and choice of respondents to participate in the study.

Consent for Publication

Not Applicable.

Availability of Data and Material

The dataset used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interest

The authors declare that they have no known competing interests that could have appeared to influence the work reported in this paper.

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Authors' Contribution

"OO administered the questionnaire, retrieved it, and participated in the writing of research methodology section; LD analysed the data, interpreted it, participated in writing the research methodology and wrote the discussion of findings as well; OE wrote the literature review section; while AE contributed to the implication of the study, and proofread the entire manuscripts".

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