Supply Chain Sustainability Transition in the Logistics Industry with ISO Standards

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Abstract- ***ISO certification standards have the potential to improve supply chain management's paradigm shift towards sustainability and circularity. In order to incorporate all supply chain partners and important stakeholders from the public and private sectors with regulatory and policy responsibilities, sustainability practices in the logistics sector must be separated from the focal enterprise alone. In order to comprehend the roles of stakeholder pressure, business competitiveness, and environmental protection in the adoption of certification standards and their subsequent impact on sustainability practices, this study reviewed the literature on certification standards and applied ecological modernization theory. Regression analysis was used in the study to create a model for the association between ISO standards and the adoption of sustainable practices in Kenya's logistics sector. According to the survey, ISO certification standards are becoming more and more important in encouraging the logistics sector to adopt sustainable practices. The small sample size and focus on a single industry—the supply chain managers and operations managers of third- and fourth-party logistics companies in Kenya—were the study's limitations. Additionally, only the ISO requirements were taken into account, ignoring additional variables that can have an impact on the adoption of sustainable practices. Future research must take into account more influencing elements and increase the study's industries, regions, and sample frame. The paper will be extremely helpful since it adds theoretical and practical knowledge about how certification requirements affect the implementation of successful sustainability programs in the supply chain management as a whole, not only in the logistics sector. One of the rare studies that examines the application of the tripods of sustainability in a single overarching framework is this one, which combines the main ISO standards (ISO 9001, ISO 14000, OHSAS 18000, and SA 8000). In light of the dangers posed by climate change, growing rivalry, and depleting global resources, it provides a more substantial theoretical contribution to the implementation of sustainability.***

Indexed Terms- ***Certification standards, Sustainability, Supply chain sustainability implementation, ISO standards***

I. INTRODUCTION

Government policy makers and corporate leaders have been compelled to look for new sources of efficiency and better quality products and services due to the exposure and ongoing internationalization of commerce and the pressure from competition. The significance of supply chains and logistics in the global management of goods and services has led to an unparalleled expansion of information communication technology systems and logistics infrastructure in Africa and beyond (Ochieng, Ngugi & Odhiambo, 2018; Bajec, Tuljak-Suban & Krmac, 2015). As a result, supply chain management now heavily relies on twin factors of strategic procurement management and logistics service providers must consider the effectiveness and quality of their goods and services (Bajec et al., 2015: Kitavi, Ochieng, & Sang, 2020).

Logistics service providers are concerned with more than just meeting supply chain challenges related to quality and cost optimization. Increased logistics operations have had detrimental effects on society and the environment, including: global warming and climate change; employee vulnerability; discrimination; business facilitation; physical punishment; prolonged family separation; and numerous reports of HIV/AIDS infections (Ochieng et al., 2018). It was discovered that the logistics sector significantly affects both the environment and society. Black (2006) enumerated the negative health effects of pollution, accidents, traffic jams, noise, visual intrusion, and other factors as part of the social impact

of logistics. The main sources of CO2 and other GHG emissions were determined to be transportation and warehousing (Seong-Tae & Song-Yoon, 2012). In addition, supply chain partners on both the upstream and the downstream were also found to have indirectly contributed to the environmental impact (Arimura, Darnall & Katayama, 2011). Lately, due to regulatory pressures and the need for business competitiveness, the need to initiate environmental protection and social accountability has begun to attract greater attention (Bajec et al., 2015; Skjoett-Lassen, 2000). Adoption of eco-friendly attitude and social sustainability cultures is no longer a choice but an obligation and necessity imposed by stakeholders and competitive forces (Ochieng *et al.,* 2018; Gonzalez-Benito, 2005).

In order to implement quality as well as environmental protection and social accountability, the academic community and practitioners have proposed and applied different approaches. These includes orientation and configuration of firm resources towards sustainability (Ochieng *et al.,* 2018), corporate citizenship and supply chain partner development (Hughes, 2017: Ochieng, 2014) and certification standards (Qi, Zeng, Yin & Lin, 2013) among others. This study is most concerned about certification standards, more so the voluntary certification standards provided by the International Organization for Standardization that requires third party verification. A number of research articles dealing with quality, environmental and social welfare standards in different industry, especially the manufacturing industry have been published (Qi *et al.,* 2013; Wang *et al.,* 2011; Fitria, 2011; Bajec et al., 2015; Ciliberti et al., 2009). However, Marimon *et al*. (2011),Blind and Hipp (2003), Gunasekaran and Cheng (2008) and Murphy and Poist (2000) have demonstrated that research on the influence of certification standards on the implementation of supply chain sustainability (particularly the logistics industry) has drawn little attention, especially in the developing countries. Moreover, logistics providers are currently forced to spend executive's time in search for new ways to provide higher quality in order to satisfy customers and maintain competitiveness on the global market. Therefore our study notes that, in the field of certification standards within the logistics industry, there is plenty of room left for research. In the review of literature many deficiencies have been identified. Our paper will endeavour to identify the impact of certification standards on the implementation of economic, environmental and social dimensions of sustainability practices among of logistics service providers in Kenya.

Literature Review and Hypothesis Development

In this study, we discuss business decisions based on certification standards and supply chain sustainability as well as related theories. The first section is dedicated to discussion of literature on certification standards from the perspective of voluntary certification standards that requires 3rd party verification and briefly on association based voluntary certification standards. The second section deals with related theories of the construct of certification standards within the confines of this research. This study seeks to find the theoretical foundation of the construct based on the ecological modernization theory and the stakeholder theory.

ISO Standards

In logistics and supply chain ISO standards are a set of specifications or criteria for or attributes of product, processes or service which presents rules or norms by which actions of logistics service providers and supply chain practitioners can be judged and evaluated (Matus, 2009; Ponte, Gibbon & Vestergaard, 2011). Often there is a distinction between certification standards set, monitored and enforced by the public authorities and private voluntary standards (Ponte *et al., 2011*; Moser, Hilderbrandt & Bailis, 2014). Public regulatory certification standards have been found to be time consuming to set, monitor and enforce. Again, they are often costly and fraught with bureaucratic challenges (Matus, 2009).

Voluntary certification standards have evolved in two parallels (Moser *et al.,* 2014*)*. In this study, we provide just a highlight on the standards that offer guiding norms in multilateral arrangement between companies and greater detailed study on the certification standards that require third party verifications where ISO certifications are considered. Both parallels provide imperative tools for moving supply chain processes and products towards sustainability (Matus, 2009; Moser *et al.,* 2011). They seek to drive sustainable production and consumption by creating market demand for sustainable products, and a supply

to meet that demand. They help buyers (both consumers and businesses) identify sustainably-produced products, and they guide producers, forest managers, mine and tourism operators, and factory owners and others in the choice of sustainable practices. Some of the best known sustainability standards—e.g. Fairtrade International, the Rain Forest Alliance, Ethical Trading Initiative, Work Place Safety Groups, Clean Cargo Working Group (CCWG), Global Forestry Initiative, Partners in Protection, the Forest Stewardship Council (FSC), and the Marine Stewardship Council (MSC) are some of the well-known brands in many countries (Komives & Jackson, 2014). Consumers rely on their partnership to inform buying decisions. Business attention to sustainable procurement has grown, increasing both supply and demand for products produced in accordance with sustainability standards.

ISO Certification Standards

ISO 9001 and implementation of supply chain sustainability

According to the extant works by (Ejdys & Matuszak-Flejszman 2010; Qi, Zeng, Yin & Lin, 2013) one strategy for implementing a firm's sustainability goals is to certify with international standardized management systems. Qi *et al.* (2013) focuses on three international standardized management systems that captures firms' effort in pursuing the three pillars of sustainability dimensions, the economic, environmental and social dimensions of sustainability. The ISO 9001 quality management system was first published in 1987 based on a previous standard, BS 5750, developed by the BSI (British Standards Institution) Group. It provides a systematic framework to manage an organization's processes so that firms consistently create products and provide services that satisfy customer expectations and is often viewed as a critical underpinning for a firm's sustainable economic success (Matias & Coelho, 2002; Lin *et al.,* 2014; Maack, 2012).

The global adoption of ISO 9001 may be attributable to a number of factors. A number of major purchasers require their suppliers to hold ISO 9001 certification. In addition to several stakeholders' benefits, a number of studies have identified significant financial benefits for organizations certified to ISO 9001. (British Assessment Bureau, 2011) showed that 44% of their certified clients had won new business. Corbett, Montes-Sancho, & Kirsck, 2005) showed that certified organizations achieved superior return on assets compared to otherwise similar organizations without certification. (Heras, Dick & Casadesus, 2002) found similarly superior performance and demonstrated that this was statistically significant and not a function of organization size. Naveh and Marcus (2005) claimed that implementing ISO 9001 led to superior operational performance in the US automotive industry. Sharma (2005) identified similar improvements in operating performance and linked this to superior financial performance. Chow-Chua, Goh & Wan (2003) showed better overall financial performance was achieved for companies in Denmark. Studies have also showed that ISO 9001 certification resulted in superior stock market performance and suggested that shareholders were richly rewarded for the investment in an ISO 9001 system.

Tari, Molina-Azorin & Heras (2012) enumerated a number of benefits of ISO 9001 certification as improved market share, export facilitation, sales growth, profitability, improved systematization, efficiency, competitive advantage, improved image, improved employee productivity, improved customer satisfaction, improved relationship with the authorities and other stakeholders. Additional empirical literature has added the benefits of ISO 9000 series to include better documentation, process improvement, better machine calibration, reduced defects, 100% on time delivery, continuous improvement, lower expenses, lower insurance and capital costs, increased quality assurance, higher internal motivation and adoption of best in class practices (Sroufe & Curkovic, 2008; Nga, 2009; O'Brien, 2005). Mahler (2007), Chen (2004) and Bajec *et al.* (2015), have provided evidence that ISO 9001 systems have resulted into improved industrial innovation, increased communication within and across enterprises. It provides imminent characteristic criteria for strategic supplier selection in procurement process (Mutuku, Ochieng, Sang, 2021). In summary, quality certification standards is a useful tool for building and sustaining business competitiveness while ensuring at least optimal performance, leading to greater organizational efficiency.

Studies on the benefits of ISO certifications have been done by various authors based on different topics; frequency of implementation among business sectors, firm size, level of competition in the industry and the level of flexibility required (Bajec *et al., 2015)*. Marimon, Llach and Bernardo (2011) surveyed the frequency of standards implementation in different sectors. They were able to show that in Europe, the top five highest ranked business activities in ISO 9001standards implementation were: basic metal and fabricated metal products; construction; electrical and optical equipment; wholesale and retailers; and rubber and plastic products. In terms of size Rondinelli and Vastag (2000), showed that medium and smaller enterprises often have difficulty in launching standards implementation due to the high investment in financial as well as human capital which they cannot afford. Additionally, stiff competition, flexibility and higher levels of accuracy required in the service industry makes more firms willing to implement standards Blind and Hipp (2003). These studies on the benefits and implementation of certification standards have been done in the manufacturing industry. However, only few studies have linked quality standards and economic, social and environmental effect in the logistics industry.

ISO 14001 and implementation of supply chain sustainability

Among environmental management strategies, financing green supply chain management encourages supply chain parties to be environmentally conscious (Sarkis, Zhu & Lai, 2011; Matuvi, Karuti, & Ochieng, 2024). Improved green supply chain performance requires suppliers to consider eco-purchasing, eco-design and eco-manufacturing (Ochieng *et al*., 2018); eco-friendly transport modes, load planning and consolidation, use of information technology for emissions management, energy use and water management (Sarkis, 2006); sustainable packaging and reverse logistics (Harvani, Helms & Sarkis, 2005).

Companies are often driven by primary and secondary external factors to adopt environmental protection. Among the primary external drivers for adoption of environmental protection are the stakeholders whose engagement with the firm is absolutely imperative for the firm's success. These include customers, shareholders, supplier and governments (Ochieng *et al.*, 2018; Wolf & Seuring, 2010). As a matter of necessity for improving and maintaining relationship, customers some customers would demand eco-friendly behaviour and attitude (Bajec *et al*., 2015). Shareholders are concerned about loss of competitiveness due to non-compliance to environmental standards whereas governments are often influence adoption of sustainable development through regulatory frameworks (Wolf *et al., 2010;* Sarkis *et al.,* 2011).

Supply chain practitioners have a number of alternatives for greening their operations in order to reduce and eventually eradicate negative environmental impact (Bajec *et al.,* 2015). These array of alternatives include environmental management systems, Eco-management and audit systems, investment recovery eco-design, green purchasing, design for recycling, re-use and disassembly, loop supply chain, social media technology (Perotti *et al.,* 2012: Wachira, Ochieng, Muasya, Musyoka, Odek, & Sang, 2019).). The ISO 14001 quality standard, falling into the group of internal environmental management, is just one of alternatives, but in the view of Arimura *et al*. (2011), it is one of the key promoters and developers of the green supply chain.

The ISO 14001 environmental management system, published by ISO in 1996, provides firms with an overall management structure that addresses immediate and long-term environmental impacts of firms' products, services, and processes. The new ISO 14001:2015 standard has been published and includes several new updates all aimed at making environmental management more comprehensive and relevant to the supply chain. One of the main updates is the consideration of environmental impacts during the life cycle — although there is no requirement to actually complete a life cycle analysis. In addition the commitments of top management and the methods of evaluating compliance have also been strengthened.

ISO 14000 series is an environmental standard that provides an organization with structured framework to manage the environmental impact and responsibilities (Elefsiniotis & Wareham, 2005). Among its series, ISO 14000 concentrates on the firm's management, environmental auditing as well as environmental performance whilst others include tools for

environmental labeling, lifecycle assessment procedures and product design for eco-compliance (Elefsiniotis *et al.,* 2005).

The enumerated benefits of ISO 14000 adoption include clear definition of environmental and economic goals and responsibilities, greater awareness and understanding of environmental risks and incidences, and greater improvement in shared culture and processes (Bajec et al., 2015; The International Institute for Sustainable Development, 2006). Studies have also linked the adoption of ISO 14000 and ISO 9000 to improved environmental performance measured by reduction in GHG emissions, fall in solid waste and waste water, decrease in production and use of hazardous materials, continuous improvement in the state of the environment and reduction in in environmental risks (Arimura *et al.,* 2008; Arimura *et al.,* 2011; Darnall *et al*., 2008; Frosch, 1994; Perotti *at al.,* 2012). In addition such adoption enables better business opportunities and improved sustainable competitive advantage at the enterprise level rather than at the supply chain level (Jose & Oliviera *et al.,* 2010; Melnyk *et al.,* 2003; Winter & Knemeyer, 2012; Handfield *et al.,* 2004).

Empirical studies have shown that uptake of quality or environmental standards may not guarantee neither performance improvement nor regulatory compliance due to the complexities of performance measurement and verification mechanisms (Beske, 2012). Other have asserted that some companies certify for standards merely for green washing and symbolism rather than to earn real improvement in economic and environmental performance (Rondinelli & Vastag, 2000; Bansal & Hunter, 2003). Some studies have produced contrasting findings. In Malaysia (Tan, 2003), China (Zhu and Geng, 2013) found that there is insignificant relationship between adoption of ISO 14000 and operational efficiency as well as environmental benefits. Among American and Canadian corporations, need for legitimacy was the key driver for adoption of ISO 14000 rather than the need for improved environmental management (Matten & Moon, 2008; Wiengerten *et al*., 2012; Boiral & Roy, 2007). These differences in literature based on continental and sectorial analysis was the main impetus for this study.

OHSAS 18001 and implementation of supply chain sustainability

OHSAS 18001, Occupational Health and Safety Assessment Series, (officially BS OHSAS 18001) is an internationally applied British standard for occupational health and safety management systems. It exists to help all kinds of organizations put in place demonstrably sound occupational health and safety performance. It is a widely recognized and popular occupational health and safety management system (BS, 2015). Its proponents claim that an occupational health and safety management system (OHSMS) promotes a safe and healthy working environment by providing a framework that helps organizations to: Identify and control health and safety risks; reduce the potential for accidents; aid legal compliance; improve overall performance (Kangwana, Kilonzo, & Ochieng, 2020). The OHSAS 18000 standards provide organizations with the elements of an effective safety management system which can be integrated with other management systems such as ISO, 9001 and ISO 14001 and help organizations achieve better occupational health and safety performance and economic objectives (Heras *et al.,* 2012). The elements of OHSAS, 18001shown in the figure 1.

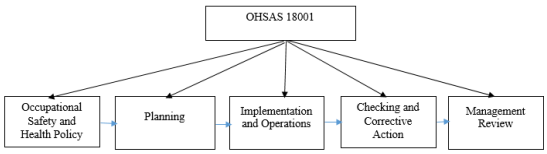

Figure 1. The five elements of OHSAS 18001|

Source: Adapted from ICMR (2003)

BS OHSAS 18001 specifies requirements for an OH&S management system to help an organization develop and implement a policy and objectives, which take into account legal requirements and information about OH&S risks. It applies to all types and sizes of organizations and accommodates diverse geographical, cultural and social conditions.

The establishment, implementation and improvement of an organization's OHSMS has it foundation on the policy document. The policy document provides the strategic sense of direction and gives the principles and action plans that are sanctioned by the top management (Marhani, Adnan & Ismail, 2013; ICMR Bulletin, 2003). During planning stage, OH & S goals

and objectives are crafted and the programme for managing OH & S is established. Again, planning involve identification of potential hazards and possible risks, risk assessment and control, legal necessities and the designated activities, products, services or operating conditions of the organisation through the reviewing at regular authority for the achievement of OHSAS 18001 (Dababneh, 2001; Yunus, 2006; Marhani *et al*., 2013).

ICMR Bulletin (2003) stated that the implementation of OHSAS/OHSMS, prioritising the use OH&S resources, defining the structure and responsibility of personnel, establishing documentation of the core system elements and its interaction.

SA 8000 and implementation of supply chain sustainability

SA8000 is a five-year auditable certification standard that encourages organizations to develop, maintain, and apply socially acceptable practices in the workplace (SAI, 2013). The SA8000 streamlines the complexities of navigating industry and corporate codes to create a common language and standard for measuring social compliance. As it can be applied worldwide to any company in any industry, it is an extremely useful tool in measuring, comparing, and verifying social accountability in the workplace. Certification is granted by independent certification bodies that are accredited and overseen by Social Accountability Accreditation Services (SAAS, 2015). It gauges compliance with eight key criteria of child labour avoidance, non-support for forced or compulsory labour, health and safety, freedom of association and right for collective bargaining, non-discrimination, zero tolerance to mental and physical abuse and no to harsh or inhuman treatment, fair working hours, and respect for fair personal living wage.

The study of social sustainability certification by Ciliberti *et al.* (2009), investigated the implementation of SA8000 and the outcomes of implementation rather than the antecedents. They found that implementation leads to trust and a reduction of information asymmetry. They also stated that one of the reasons for getting the certification was to show their commitment to sustainability issues. Additionally, Darnall *et al.* (2008) found that companies adopted sustainable management systems due to specific cultural orientation and commitment but not for social capital reasons.

The aforementioned literature testifies to the fact that certification in different sectors, continents and countries have different effects to the tidings in sustainability. The situation in Kenya is yet to be fully determined. We therefore hypothesize that:

H_1: Kenyan logistics service providers that have certified their operations, processes and activities with international management organizations, including ISO 9001, ISO 14001, OHSAS 18001 and SA 8000 are more likely to implement sustainability practices than those that are not.

Theoretical Basis for Certification Standards

Stakeholder Theory

Stakeholder theory was put forward by Freeman (1984) as a proposal for the strategic management of organizations in the late twentieth century. Over time, this theory has gained in importance, with key works by Mitchell *et al.*, (1997), Rowley (1997) and Frooman (1999) enabling both greater theoretical depth and development. From an initially strategic perspective, the theory evolved and has been adopted as a means of management by many market-based organizations and disciplines. As early as 1963, Stanford Research Institute had proposed that shareholders were the only group that the management was to be sensitive to. Freeman (1984) later expanded this thought and argued that business organizations should be concerned about the interests of other stakeholders when taking strategic decisions.

During the 1980s the stakeholder approach won considerable acceptance in organization theory, in the corporate social responsibility literature, and in strategic management. The standard definition of the concept can be stated as follows: stakeholder in an organization is any group or individual who can affect or is affected by the achievement of the organization's objectives, practices and functions (Freeman, 1984). From a normative perspective, some modification of the stakeholder concept was required. Zsolnai (2006) proposed a generalization and an ethical restriction of the notion to include a wider spectrum of stakeholders.

In the new definition, stakeholders are those beings that are affected by the functioning of an organization not only from ecological but also from social perspectives (Bjorklund, 2010). This definition provides a sustainability overtures and restriction on the original notion because those parties are included among the stakeholders who can affect the functioning of an organization negatively. The definition is also permits consideration of beings other than human individuals and groups, namely biological creatures, ecosystems, and even the Earth as a whole, thus fitting within the realm of discussion of supply chain sustainability. Similarly, stakeholders are not necessarily presently existing beings. There can be future beings as well (Zsolnai, 2006; Sarkis *et al.,* 2014).

According to (Raposo *et al.,* 2012; Sarkis, 2011), stakeholder groups may be subdivided into two: the primary – those with formal or official contractual relationships with the company, such as clients, suppliers, employees, shareholders, and the secondary – those without such contracts, such as government authorities, the pressure groups, member associations, the NGO or the local community. However, this classification may change over time (Sandhu, 2012). For example, the predominance of environmental groups and agencies plays a more significant role in influencing the behaviour of firms today than in the past. Mitchell *et al.* (1997) further present a classification based on the dimensions of power, urgency and legitimacy to help unpack stakeholder saliency. With regard to these three attributes, the spectrum of stakeholders starts with definitive stakeholders on one side and ends with non-stakeholders on the other side, fitting well with Zsolnai proposal (Mitchell *et al.,* 1997).

Over time, the stakeholder concept has taken on greater importance due to public interest, greater coverage by the media, concerns about corporative governance and its adoption as a policy (Mainardes, Alves & Raposo, 2012). Stakeholders can influence organizations to follow specific actions, including sustainability initiatives and voluntary integration of sustainability into business operations (Rowley, 1997; Vurro *et al.,* 2009; Russo &Perrini, 2010).

This theory supports the variable certification standards by highlighting the mechanisms through which stakeholder exercises influence on the adoption of social and environmental, and economic standards and practices across supply chains (Maignan & Mcalister, 2003; González-Benito & González-Benito, 2006; Matos & Hall, 2007; Sarkis *et al.,* 2014). For instance, González-Benito and González-Benito (2006) analyzed the role of stakeholder pressure in the implementation of environmental practices at the supply chain level. In analyzing 186 case examples, the authors found that the media. Non-governmental and the authority's regulatory pressure can explain the implementation of environmental and social practices among supply chain firms.

II. METHODOLOGY

Questionnaire development and data collection

The logistics industry in Kenya has seen dramatic growth of different types of logistics service providers ranging from first party logistics providers to fourth party logistics providers. For this study, only third and fourth party logistics providers that offer multiple logistics services and those that manage end-end supply chains were considered. The first and the second party logistics providers offers only limited logistics services and thus, would not be interested in certification standards. Again, they are often much smaller companies and thus cannot afford the expenses and the motivation to implement certification standards. Sample consisted of 167 logistics companies of which 16.6 percent represented large and medium foreign logistics companies while 83.4 percent were local medium and small sized logistics providers.

A five-point Likert scale questionnaire, with highest and lowest-points "agree to very large extent" and "does not agree at all" was used to measure the items. The middle point was set as "moderate extent". The survey instrument was sent out to each logistics provider by e-mail along with a cover letter explaining the purpose of the study and a confidentiality agreement. After two weeks, the questionnaires were then sent to the operations manager and the supply chain manager of each logistics provider. Chiefly, this was because these were top managers responsible for decision making on implementation certification

standards and therefore have most comprehensive overview and knowledge of the subject matter of the study and were well acquainted with its advantages (Jose de Oliviera, Serra & Salgado, 2010). Additionally, as Quazi, Khoo, Tan and Wong (2001) have attested, implementation of such strategic issue requires top management support. The questionnaires were sent to the two top officers as a way of mitigating non-response bias. Thus non-response bias was not a problem in this study. The response rate to the questionnaires was 86.8 percent.

Measures

In measuring the theoretical constructs, the study conceptualised the independent variables as follows. The ISO 9001 was conceptualised as "effective process and activity performance has improved working capital efficiency", "constant supply chain processes and activity value addition is the key to firm margin improvement", "commitment to consistently meet customer/ stakeholder requirement has improved the firm's local and international market share", "processes and activity performance measurement and evaluation based on data and stakeholder information has been key to supply chain risk management".

ISO 14000 was conceptualised in form of the following statements: "the firm regularly audits material, water and energy consumption", "the internal environmental management system has reduced GHG emissions", "awareness and understanding of environmental standards targets zero waste and releases", "the firm regularly performs environmental audit of supply base", "there is regular risk assessment on for energy and resource use".

OHSAS 18001 was measured using, "improved distribution of documents containing OH &S information", "impact and life cycle assessment tools for materials is available", "effective occupational risk control systems has contributed to reduced costs and liabilities", "focus on OH &S is in alignment to customer requirement", "effective hazard identification is a demonstration of strong commitment to occupational health and safety excellence", "effective occupational risk assessment reduces incidents of accidents and increases performance measures".

Meanwhile, SA 8000 was measured through "work life balance policy and fair labour practices are designed to benefit workers", "training and sensitization are given on proper road use", "the firm has strong policy against child labour", "policy and practices in the firm designed to control corruption", "the firm is an equal opportunity employer", "the firm practices equity in recruitment, remuneration and promotion", "the firm has policy of dignity, respect and zero-tolerance to corporal punishment in its disciplinary procedures", "the firm does not tolerate forced or compulsory labour in assignment of duties".

Analytical Procedure

In order to ensure validity, reliability and unidimensionality, several steps were followed (Chen & Pulraj, 2004). Content validity of the instrument was established by grounding the study on existing literature and by reviewing and testing the instrument by the industry experts. The experts were asked to go through the document to locate any problems with readability, structure, ambiguity and completeness (Dillman, 1978). Few ambiguities that were identified were corrected before the survey was done.

Upon receiving the results the items were tested for normality using the skewness and kurtosis. All the indicators were within the -2 and +2 (Pazirandeh & Jafari, 2013), indicating that the entire data set was normal and all the measures retained. The reliability of the measurements was evaluated by Cronbach"s α coefficient. In the scales reliability, Cronbach's α coefficients were all greater than 0.70 (Cronbach, 1951 & Nunnaly, 1978). Thus, internal consistency of the measures used in this study were considered good for all constructs. The data was tested for multicollinearity using the variance inflation factor (VIF), with non-orthogonality among independent variables inflates standard error. Table II, shows that the variance inflation factor ranges between 2.02 to 5.46 which was below the recommended cut-off value of 10 (Halcoussis, 2005). The independent variables were thus not correlated among themselves. This showed that there was no substantial problem of multicollinearity encountered in the study.

III. RESULTS AND DISCUSSION

Correlation and Regression Analysis for Certification

and Implementation of Supply Chain Sustainability

An examination of the scatter plot Figure II between implementation of supply chain sustainability and certification for various standardizations indicated that there was a positive correlation between the two variables. This suggests that certification had some influence on implementation of supply chain sustainability initiatives and programmes.

The Pearson correlation analysis results presented in Table I revealed that there was a positive significant correlation between implementation of supply chain sustainability and certification, with p- value =0.000<0.01 and r=0.554 other factors held constant. Though this r value may look small, it is recommended that with large sample size of more than 300, an r value of 0.3 can be highly statistically significant (UWE, 2017).This implies that there was a significant relationship (55.4%) between certification and implementation of supply chain sustainability which is about the recommended 30% (Mugenda & Mugenda, 2003; UWE, 2017). These finding were consistent with (Lin *et al.,* 2013; Matias & Coelho, 2002; Corbett, Montes-Sancho, & Kirsck, 2005) who showed that certified organizations achieved superior return on assets compared to otherwise similar organizations without certification. (Heras, Dick & Casadesus, 2002) found similarly superior performance and demonstrated that there was statistically significant relationship between certification and sustainability implementation and not just a function of organization size.

Regression analysis for certification with implementation of supply chain sustainability initiatives were conducted and the model summary Table II clearly indicates a relationship between certification and implementation of supply chain sustainability initiatives in which R2 = 0.307 implying that 30.7% of implementation of supply chain sustainability was explained by certification. This suggests that achieving ISO 9001 and ISO 14001 certification comes with numerous benefits such as improved market share, export facilitation, sales growth, profitability, improved systematization, efficiency, competitive advantage, improved image, improved employee productivity, improved customer satisfaction, improved relationship with the authorities and other stakeholders (Tari, Molina-Azorin & Heras, 2012).

Table III gives ANOVA summary for certification and implementation of supply chain sustainability among logistics service providers in Kenya. The F-Statistics value=139.428 and p value 0.000<0.05 meaning that the model of implementation of supply chain sustainability initiatives with certification was significant. This indicates that there was a significant relationship between certification and implementation of supply chain sustainability among logistics service providers in Kenya.

Coefficient for Regression between Certification and Implementation of Supply Chain Sustainability Initiatives

From the beta coefficient summary Table IV the t-values are 16.563 and 11.808 with p-values being 0.000 which is less than 0.05 hence it was concluded that the model was statistically significant. The model was defined as $Y = 2.053 + 0.404X_2 + \varepsilon$ indicating that every unit change in certification lead to 0.404 or 40.4% increase of implementation of SCS initiatives. This implies that certification is essential in the implementation of supply chain sustainability among logistics service providers in Kenya.

The results on correlation and regression on certification and implementation of supply chain sustainability initiatives depicts a clear positive relationship. On ISO 9001, the findings are in concurrence with the assertions of Matias & Coelho (2002); Lin *et al.* (2014) that, ISO 9001 provides a systematic framework to manage an organization's processes so that firms consistently create products and provide services that satisfy customer expectations and is often viewed as a critical underpinning for a firm's sustainable economic success. These findings are also in agreement with the views of ISO (2015) that ISO 14001:2015 standard that has included life cycle assessment and commitment of top management aimed at making environmental management more comprehensive and relevant to the supply chain.

The findings of the study further corroborates the findings of Qi *et al.,* (2013). In their study, "ISO and

OHSAS supply chain process/product certification: How stakeholders affect corporate decisions on sustainability", studied the extent and the impact of international certification and standardization such as ISO 9001, ISO 14001 and OHSAS, 18001 among Chinese logistics service providers. They found that acquisition of the various supply chain process/product certification for different standards was in effort to comply with economic, social and environmental sustainability requirements. Several other scholars had their findings echoed by this study. Bajec *et al.* (2015) in the study "Do ISO standards favour logistics provider efficiency, competitiveness and sustainability? A Slovenian perspective", Investigated the twin issues of the prevalence of the application of standards and their positive influence on the efficiency and competitiveness of Slovenian logistics service and the relationship between the adoption of the environmental and social standards and firm sustainability. Using abductive approach to solve the question of whether ISO standards have effect on logistics service providers' efficiency, competitiveness and sustainability in Slovenia determined that service industry (Where logistics belong) are more willing to adopt environmental and social standards in order to enhance sustainability in agreement with Hipp (2003), Hansmann and Kroger (2001), The International Institute for Sustainable Development (1996) and Zutsi and Sohal (2004).

It was the objective of the study to assess how certification drive the implementation of supply chain sustainability among logistics service providers in Kenya. Based on this objective and literature review, the given alternative hypothesis was formulated for testing.

H_1: Kenyan logistics service providers that have certified their operations, processes and activities with international management organizations, including ISO 9001, ISO 14001, OHSAS 18001 and SA 8000 are more likely to implement sustainability practices than those that are not.

The hypothesis was tested by regressing certification on implementation of SCS. Given the level of significance of the ANOVA (0.000 that is $p< 0.05$) and $t= 11.808$, the study therefore failed to reject the alternative hypothesis 2. The study concluded that there was a positive significant correlation between certification and implementation of supply chain sustainability initiatives among logistics service providers in Kenya.

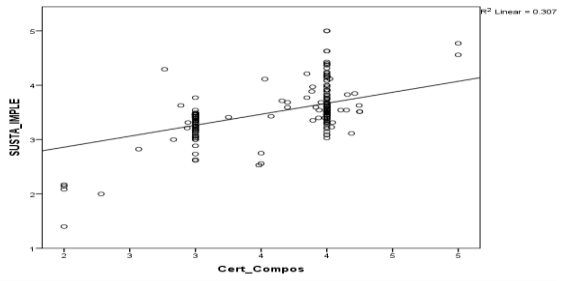

Figure II: Scatter plot for Implementation of Supply Chain Sustainability and Certification.

Table I: Correlation between Implementation of Supply Chain Sustainability and Certification

		Implementation of Supply Chain Sustainability	Certification
Implementation of Supply Chain Sustainability	Pearson Correlation	1	.554**
	Sig. (2-tailed		.000
	N	317	317
Certification	Pearson Correlation	.554**	1
	Sig. (2-tailed	.000	
	N	317	318

**. Correlation is significant at the 0.01 level (2-tailed).

Table II: Model Summary for Certification

Model	R	R Square	Adjusted R Square	Standardised error of estimate
1	.554[a]	.307	.305	.325

a. Predictors: (Constant), Cert_Composi

b. Dependent variable: SUSTA_IMPLE

Table III: ANOVA Test for Certification and Implementation of Supply Chain Sustainability Initiatives

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14.766	1	14.766	139.428	.000[b]
	Residual	33.360	315	.106		
	Total	48.127	316			

a. Predictors: (Constant), Cert_Compos
b. Dependent variable: SUSTA_IMPLE

Table IV: Coefficient on Implementation of Supply Chain Sustainability Initiatives and Certification.

Model		Unstandardized Coefficients		Standardised Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.053	.124		16.563	.000
	Cert_Compos	.404	.034	.554	11.808	.000

a. Dependent variable: SUSTA_IMPLE

CONCLUSION

This paper highlighted the view of other researchers on the application of certification standards and their influence on the efficiency, competitiveness, environmental protection and social accountability in different sectors, continents and countries. Moreover, an analysis was done on the relationship between the adoption of ISO 9001, ISO 14001, OHSAS 18001 and SA 8000 and the implementation of sustainability practices among logistics service providers in Kenya. Rigorous statistical methods were used. Regression analysis was used to test the hypothesis and establish the model of the study based on the reviewed literature. The results confirm significant correlation between certification standards and improved sustainability practices targeting environmental protection, fair labour relations and social accountability.

The outcome of this study is of immense value to both local and international policy makers and managers in the private and public sector. The governments, the standards organization, the third party reviewers and accreditation organizations will have accurate picture to offer renewed motivation and incentives to encourage users and consumers of these standards. Furthermore countries in Africa, especially those in the East and southern Africa may find this study useful in their efforts to mitigate the impact of climate change, loss of productivity and business inefficiency.

It is imperative to mention the limitations of this study. First, only a small segment of the logistics providers were considered in the study targeting only one country among many countries. The third party and the fourth party segment is at its nascent stage of growth in Kenya and is highly dominated by multinational global logistics service providers. Second, the responses were only obtained from supply chain and operations managers. These two officers are very limited in the structure of the operations of logistics companies. Third, the breadth of the logistics activities considered were only limited to transportation and warehousing. This leaves out a huge array of other logistics activities with likely huge contribution to sustainability dilemmas. Despite these limitations we believe that the validity of the obtained results is not in doubt. To improve and update the research in this field, the width of countries that share logistics operations and base, sectors and the sample frame needs to be expanded in future studies.

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