

# Supply Chain Optimization Strategies and Performance Of International Non-Governmental Organizations In Nairobi City County, Kenya

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DOI: 10.29322/IJSRP.13.04.2023.p13624

<http://dx.doi.org/10.29322/IJSRP.13.04.2023.p13624>

Paper Received Date: 3<sup>rd</sup> March 2023

Paper Acceptance Date: 4<sup>th</sup> April 2023

Paper Publication Date: 15<sup>th</sup> April 2023

**Abstract:** This study was therefore sought to determine the influence of supply chain optimization on performance of international NGOs. The specific objectives were as follows; inventory optimization, transport and logistics optimization, procurement cost optimization and E-commerce optimization on performance of international NGOs in Kenya. This study was anchored on different theories relevant to this study.

**Keywords:** Inventory optimization, transport and logistics optimization, procurement cost optimization and E-commerce optimization and performance of international NGOs .

## 1.1 Introduction

International NGOs supply chains are designed to deliver emergency aid during disasters, including food assistance, shelter, medicine, water, and sanitation. Time is of the essence in a successful catastrophe response since it equates to lives saved (Apte, Goncalves & Yoho, 2016). Effective supply chain management ideas offer opportunities to boost the efficiency and efficacy of International NGOs operations because supply chains are involved in 80% of disaster and relief activities (Papadopoulos et al. 2017). As a result, if a disaster strikes, supply chain optimization principles are used in order to react to it fast. Failure to attain efficacy and efficiency during a disaster can result in fatalities, unfavourable media attention, and a loss of crucial donor financing needed for subsequent operations (Adem et al, 2018). Global supply chains are more complex than ever. In today's challenging markets, companies face numerous challenges from commodity shortages to shipping delays, high costs of transportation, and the ever-changing customer demands. Supply chains are no longer a collection of cost centers that are distinct from organizations' core business. Globally, supply chains have become a source of competitive advantage.

### 1.1.1 Theory of Constraints (TOC)

The theory of constraints (TOC) had been widely known as a management philosophy coined by Goldratt, Cyplik, Hadaś and Domański (2009), that aimed to initiate and implement breakthrough improvement through focusing on a constraint that prevented a system from achieving a higher level of performance. The TOC paradigm essentially stated that every firm should have at least one constraint (Simatupang, Wright & Sridharan, 2004). As pointed by Simatupang et al. (2004), collaborating firms shared responsibilities and benefits with their upstream and downstream partners in order to create competitive advantage. When all the supply chain's (SC's) partners were integrated and act as a homogenous entity, profit and performance was enhanced throughout the (SC), as a combination of supply and demand (Santos, Marins, Alves & Moellmann, 2010). According to Flores and Primo (2008) affirmed that, with the crescent requirement of the market, the logistic process became more and more complex and with much higher levels of demands, especially when related to achieving a competitive advantage (Santos, et al., 2010).

Theory of constraints emphasizes focus on effectively managing the capacity and capability of these constraints if they are to improve the operational performance of their organization. This can be achieved by processing firms applying appropriate inventory control systems. Companies have struggled to invest in the technology and organizational structures needed to achieve to-date systems synchronization that enable coordinated inventory flows (Fawcett, Ogden, Magnan & Cooper, 2006). The Theory of Constraints

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<http://dx.doi.org/10.29322/IJSRP.13.04.2023.p13624>

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methodology proposes that operational performance is dependent on the application of inventory control systems in processing firm (Cox & Schleier, 2010). Theory of constraints is a methodology whose basis is applied to production for the minimization of the inventory. In reality, it is difficult for a firm to forecast with precision the consumption of its specific product at a specific region with sometime prior to production and supply of the same product (Noreen, Smith & Mackey, 1995).

Under Theory of Constraints, performance measurements are based on the principles of throughput, inventory dollar days and operating expenses (Umble, Umble, & Murakami, 2006). Theory of Constraints measurements are based on a simple relationship that highlights the influence of inventory control system on progress toward the operational performance. The proof of effectiveness for any inventory control system is the degree to which it improves operational performance of business firms. For processing firms to ensure that the bottlenecks on their operations run smoothly they have to embrace the use of inventory control systems that can facilitate operational efficiency (Umble, Umble & Murakami, 2006). This may result in the acquisition of additional capacity or new technology of inventory control systems that lift or break the constraints. Improving the performance of the constraint leads to improvement in the operational performance of the entire system. The processing firms depend on inventory as a resource in their operations. The theory of constraints contributes a lot to the building of literature in this study (Bayraktar et al., 2009). In this study therefore, the theory explains the variable on inventory optimization.

### **1.1.2 Resource Based View Theory (RBV)**

The philosophy of Resource Based View (RBV) has its roots in strategic management. Barney first launched it in 1991. The concept of RBV is that organisations that are able to acquire scarce, valuable, non-replaceable, and difficult-to-imitate resources and competencies will gain a competitive advantage over rival enterprises (Wernerfelt, 1984). Resource scarcity refers to the resource's perceived shortage in markets. Value is the degree to which resources are matched with the external environment in order to capitalise on opportunities and mitigate dangers. Substitutability denotes the amount to which rivals are able to provide equivalent resources. The degree to which rivals cannot get or copy the resources, or can only do so at a substantial cost disadvantage, indicates inimitability (Hoskisson et al., 1999). According to RBV, companies aim to find resources that would likely increase their market competitiveness and then exploit the value of these resources (Sirmon et al., 2007).

According to the RBV, a company's unique skill, which can be transferred from diverse tangible and intangible assets, is the fundamental driver of organisational performance and Intelligent advantages (Wernerfelt, 1984). In spite of its explanatory strength, the RBV is seen as largely static and insufficient for explaining enterprises' competitive advantage in changing circumstances (Priem & Butler, 2001). The dynamic capabilities view, one of the most prominent expansions to RBV, has been proposed to fill this void (Teece et al., 2007). The detection of fresh prospects is achieved by scanning and research procedures. The sensory capability is comparable to the agility dimension of vigilance. It is achieved through actions such as outlining the products and services and identifying the most suited business model for exploiting prospects (Teece, 2007). Seizing also refers to capitalising on investments made in response to perceived possibilities (Helfat & Peteraf, 2009). Reconfiguration enables businesses to continuously realign their operational capabilities with the opportunities they grasp. In the present research, the theory explains the concept of transport and logistics optimization as critical resources that provides international NGOs with a competitive advantage while efficiently utilizing finite resources.

### **1.1.3 Transaction Cost Economics (TCE) Theory**

Coase established the Transaction cost economics theory (1937). It refers to the expense of obtaining a product or service from the market rather than from within the organisation. Transaction costs include search and information costs, bargaining and decision costs, and policing and enforcement costs, according to Coase's (1937) paper "The Problem of Social Cost" (Williamson, 1979). It is observed that market prices regulate the connections between firms, but decisions within a firm are not based on maximising profit subject to market pricing. Within the organisation, decisions are taken via entrepreneurial coordination (Allen, 1999). To illustrate how Transaction Cost applies to the crucial decision points of purchase, the purchasing function's operations are further described (Baily, 2005). Transaction cost economics is primarily focused on five processes: category strategy, supplier strategy, quotation supplier selection and negotiation, operative procurement, and supplier assessment. In the first step of the category strategy, the buyer group's similar products into a single pool (Schiele, 2006) before determining a strategy for this pooled group.

One could optimise the supply chain by identifying the purchasing volume and amount of supplier dependence as part of a supplier strategy (Johnston, et al. 2004). There are two options for supplier selection and negotiation: competitive bidding and negotiation (Papazoglou & Heuvel, 2007). In the operational procurement phase, this step aids the supplier in acting in accordance with the terms reached in step 21. When the supplier is giving the component to the buyer, the supplier's performance can be measured in terms of quality, prices, and service (Papazoglou & Heuvel, 2007). If transaction costs cannot be maintained low, the corporation should manufacture a component, utilise a hybrid governance model if asset specificity is high but transaction costs can be kept low through contractual safeguards, and use the market if the component to be supplied has low asset specificity (Williamson, 2008). Regarding the supply optimization strategy, whether to use numerous or a single supplier, one may employ the same opportunistic and limitedly rational approach as the human agent in the make-or-buy decision (Ellram, Tate & Billington, 2008).

Single sourcing is employed when the supplier offers specialised technology that can provide the company with a competitive edge; however, the relationship must be protected to ensure a cooperative partnership (Walter, Müller, Helfert & Ritter, 2003). Multiple sourcing can be utilised when a component is placed in a highly competitive, unaided market that does not offer any distinctive technology that provides a competitive edge (Schwabe, 2013). When creating a supplier portfolio, a company pools suppliers with the same activities into one pool. However, since there is a distinction between special technology suppliers and suppliers providing low asset specificity, one might differentiate between parts that provide a competitive advantage and parts that do not, pooling only suppliers with high asset specificity for components delivering a competitive advantage and pooling only suppliers with low asset specificity for components not delivering a competitive advantage (Lalkaka, 2006). The transaction cost economy theory in the present study explains the concept of procurement costs optimization by suggested the effective strategies the firm should adopt.

#### **1.1.4 Dynamic Capability Theory**

The theory of dynamic capability was first coined by David Teece, Gary Pisano and Amy Shuen (Chien & Tsai, 2012). The theory describes an organization's capacity to strategically manage its resources in order to enhance performance. According to Chien and Tsai (2012), dynamic capability is the capability of an organisation to actively alter an organization's resource base. An organisation must be able to respond effectively and in a timely manner to external developments. This involves the adoption of different methods that will harness multiple strengths of the organisation and put them into use. This will enable the organisation to integrate, cultivate, and capitalise on its environmental competitive advantage. Indeed, the modern corporate environment is quite dynamic. Changes ranging from organisational structures, culture, marketing and customer's tastes and preferences are pursuing a different course. As such, organisations should have the ability to respond to these changes in the most effective manner. The dynamic capability hypothesis claims that only firms capable of doing this will be able to attain profitability in today's competitive environment (Chien & Tsai, 2012).

The market climate has grown more volatile and dynamic; businesses must embrace new supply chain strategies to remain competitive. Supply chain management is transitioning from traditional processes to agile capability of competitive bases of speed, flexibility, innovation, quality, and profitability by integrating reconfigurable resources and best practises in a knowledge-rich environment to provide customer-driven products and services in a rapidly changing market environment (Yusuf et al., 2004). Efficient Customer Response (ECR) is designed to integrate and rationalise product assortment, promotion, new product development, and replenishment across the supply chain, thereby increasing the emphasis on key areas such as EDI, cross-docking, and c-tracking (Harrison & Van Hoek, 2008). Implementing e-Commerce to optimise corporate processes providing insights into operations, connecting the supply chain, increase customer services and streamline distribution (Rao, 2002). According to Porter (2008), the adoption of information technology will alter the competitive environment in three ways: by altering the industry's structure, altering the rules of competition, and providing enterprises with new means to obtain a competitive edge.

Information technology facilitates communication between upstream and downstream parties, thereby generating a highly optimised virtual supply chain. The virtual supply chain guarantees that information is shared among partners, thereby generating process alignment through networked collaboration. Electronic Data Interchange (EDI) and the internet have enabled participants in the supply chain to share the same data instead of waiting for the chain to convey information from one step to the next. A market-driven company may easily achieve agility by investing in product research and contemporary information technology, which enables it to respond rapidly to swings in product demand and sourcing issues. Consequently, this hypothesis relates to the E-commerce variable (Rao, 2002).

#### **2.1 Inventory Optimization**

Inventory optimization is the process of maintaining the right amount of inventory required to meet demand, keep logistics costs low, and avoid common inventory issues such as stock outs, overstocking, and backorders (Mogoi & Osoro, 2022). It entails keeping or maintaining the firm's stocks at a level that a firm will only incur the least cost consistent with other management's set objectives or targets. Optimal inventory control is one of the significant tasks in supply chain management. The optimal inventory control methodologies intend to reduce the supply chain cost by controlling the inventory in an effective manner, such that, the SC members will not be affected by surplus as well as shortage of inventory. Thus, inventory optimization seeks to solve the inventory management problem faced by most organizations (Dufour et al., 2018).

The inventory management problem is one of maintaining an adequate supply of some item to meet an expected pattern of demand, while striking a reasonable balance between the cost of holding the items in inventory and the penalty (loss of sales and goodwill, say) of running out. The item may be a commodity sold by a store; it may be spare machine parts in a factory; it may be railway wagons; it may be cash in the bank to meet the customers' demand. It is indeed surprising to find that a very wide variety of seemingly different problems can be mathematically formulated as an inventory-control problem. There are, of course, several different models of inventory systems (Feizabadi, Gligor & Alibakhshi, 2021). There are three types of expenses associated with inventory systems. The relative importance of these will depend on the specific system. They are: (a) administrative cost of placing an order, called reorder cost or set cost; (b) cost of maintaining an inventory, called inventory holding cost a carrying cost, which includes storage charge,

interest, insurance, etc., a (c) shortage cost is a loss of profit, goodwill, etc., when run out of stock. All the above should be optimized for efficient supply chain management.

Maintaining optimum inventory levels decreases the cost incurred due to disruptions in business operations due to shortages of inventory, minimizes replenishment costs, and guards against changes in products prices (Mogoi & Osoro, 2022). Inventory management necessitates a suitable way of deciding what to order, amount to order and the appropriate time to place an order and ways in which all items in stock can be tracked to ensure no issues of inventory shortages and overstocking. Decisions relating to inventory are dependent on inventory in stock, forecasted demand information, lead time and inventory related costs. According to (Mogoi & Osoro, 2022). the absence of suitable inventory control systems in government entities will make it difficult for analysis of expenditures on a macro-economic level.

## 2. 2 Transport and Logistics Optimization

Today, logistics is a field that is always changing. Logistics is an interdisciplinary science that improves the quality of business processes and helps companies respond faster to market and customer needs. Today, when there is a lot of focus on the quality and high level of services, it is important to use optimization methods in the logistics process. In general, optimization methods are used more and more to manage logistic chains because their results suggest ways to make business processes better. One benefit of optimization methods is that they can lower the costs of transport, storage, and production. In addition to being good for the economy, the process of optimization makes better use of the time needed to carry out logistic operations (Mogoi & Osoro, 2022).

Transport logistics is all about moving goods around within a network of transport. This kind of logistics is an important part of logistics as a whole. Transport logistics is concerned with both scheduling and how things work in the transportation network. Transport logistics is about coordinating and making the best use of the movement of both goods and people. Transport logistics adjusts these moves from the time and place they enter the network to the time and place they leave it. In real life, this means that all shipments are coordinated from the time they are picked up by a carrier until they are delivered to their destination (Mogoi & Osoro, 2022). When it comes to passengers, transport logistics makes sure that their movements are as smooth as possible from the time they arrive at the first stop on their journey to the time they arrive at their final destination. If we look at transportation logistics from a bigger picture, we might see it as a way to optimize the way capacities are spread out in space. The next step is to coordinate the movements and actions of all the facilities and devices that are needed to move a given transport element. With the help of transport logistics, transport nodes can be spread out more efficiently. This makes transport less demanding. When it comes to freight shipping, both the cost of shipping and the amount of work involved go down (Stopka et al. 2016).

Supply chains have grown more global and interconnected; as a result, they have increased their exposure to shocks and increased the frequency of disruptions. Supply chain speed only exacerbates the problem. Even minor missteps and miscalculations can have major consequences as their impacts spread throughout complex supply chain networks (Mogoi & Osoro, 2022). As compliance mandates, suppliers and information flows multiply, supply chains are becoming more complex, costly and vulnerable. Organizations are finding it increasingly difficult to respond to these challenges, especially with conventional supply chain strategies and designs. This is making transport and logistics optimization a must. Freight management plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. It is the management of all these functions and sub-functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics (Kelvin et al., 2021).

## 2.3 Procurement Cost Optimization

Procurement costs include all costs happen in the SC activities, for instance, demand forecasting, inventory management, material handling, packing, service support, site selection, procurement, transportation, warehousing. According to Kaur *et al.* (2019), "a cost that is not measured is not managed". Costs reported from individual SC functions such as purchasing, warehouse and logistics should be collected to support decision making of the whole Supply chain. A management accounting system is needed to measure the costs at different SC function and the total costs along the chain (Hapres, 2022). Procurement Cost optimization is a business-focused, continuous discipline to drive spending and cost reduction, while maximizing business value. It includes: Obtaining the best pricing and terms for all business purchases Standardizing, simplifying and rationalizing platforms, applications, processes and services and Automating and digitalizing IT and business operations.

Cost optimization continuously delivers sustainable value to organizational stakeholders (which is procurement's output) with minimal external spend and human resource effort (procurement's inputs). A company that delivers sustainable value can be said to be effective. One that minimizes inputs can be said to be efficient. Cost optimization is more than just cost efficiency or cost effectiveness. It must be both, and more. Companies that are only efficient fail slowly due to their lack of dynamism (inertia) (Mogoi & Osoro, 2022). Their lean processes keep them going, but they are gradually overhauled by more dynamic competitors. By contrast, companies that are only effective may collapse, especially in the event of a sudden shock, a phenomenon that has been termed "active inertia". Effective companies tend to carry on doing the same things that worked in the past, even though the circumstances have



changed, without paying attention to the efficiencies that would enable them to ride out a crisis (Deloitte, 2018). To excel a company must be both effective and efficient and the procurement function must work with internal stakeholders and external suppliers and partners to achieve the synergies that amplify efficiency and effectiveness. A critically important aspect of this collaborative effort is to help the organization to reduce the time to value, for example by ensuring the robustness of supply chains and, where necessary, mitigating risks of supply chain disruption (Mogoi & Osoro, 2022).

In this way a procurement organization becomes a strategic partner of the wider business, contributing to the organization's ultimate aim, which must be to increase revenues and profitability by delivering customer success. Cost optimization in this broader sense of delivering maximum value takes on even greater importance in 2021 as organizations sought to bounce back from the disruptions and challenges brought by the Covid-19 pandemic. It is a systematic effort made to improve profit margins and obtain the best results under given circumstances or situations. The cost optimization is a process that should be carried out throughout to foster efficiency and effectiveness in the company's operations (Apte et al., 2016). Business uncertainty will continue to impact organizations, and even a well thought-out cost savings program can prove ineffective in the long run. However, when cost pressures are intense, businesses must overcome the dual challenge of continuously innovating while reducing spend to outperform the competition (Damodaram, Reddy, Davanam & Thejasree, 2022). Overcoming these obstacles requires a strategic cost optimization program to strike a balance between cost reduction initiatives and investments needed to generate process efficiencies, improve quality of service, build a stronger value chain, improve skill management and increase customer satisfaction. Further, cost optimization cannot be a one-time strategic initiative. Instead, it should be a guiding principle for managing organizations in the most efficient manner while responding promptly to fluctuations in business conditions.

## 2.4 E-Commerce Optimization

E-commerce optimization is a term used to refer to the use of computers or any other process that helps to produce, manipulate process, store, communicate, and/or disseminate information and it includes hardware, software, databases, networks and other related components which are used to build information systems (Dufour, Laporte, Paquette & Rancourt, 2018). Traditionally, E-commerce investments included E-commerce equipment, communications equipment and software (pre-packaged software, customized software and software developed in-house). At present E-commerce investments include intellectual capital structure and complementary assets such as human capital, organizational capital, process capital, innovation capital, customer capital and financial capital. Different firms allocate their resources differently in a way that maximizes their objectives and those firms that allocate more resources on IT perform better than those firms that allocate less resource. Achieving high performance also requires good IT infrastructure supported by good IT management practice (Mogoi & Osoro, 2022).

By means of various internet sales channels (websites, online marketplaces, search engines, etc.), e-commerce permits market actors to compare, choose and safely purchase products and services. Firms typically start their web presentation by providing information about their business and their consumer-oriented products/services in support of other sales channels (Nyile, Ismail & Osoro, 2021). The importance of e-commerce in today's business is supported by the fact provided by Eurostat stating, that in 2018, e-commerce represented 18% of the total sales in the European Union (EU) countries. In addition, it was found that one out of five firms in the EU used e-commerce in 2017, while the percentage of firms that employed e-sales increased by 7% during the period from 2008 to 2018. What is more, the current situation associated to COVID-19 has shown that e-commerce can be an important tool for the overall economy. Actually, according to the World Trade Organization (WTO) (2020), the situation induced due to COVID-19 has resulted in an increase in Business-to-Business (B2B) e-commerce. In the same report, it is underlined that the global nature of COVID-19 and its impact on e-commerce will further encourage international cooperation and development of policies related to e-commerce (Feizabadi et al., 2021).

Numerous studies have looked at the topic of how businesses are represented in e-commerce as well as how e-commerce affects overall firm performance. E-commerce actually has a lot of advantages for consumers, businesses, and society at large. E-commerce presents potential for traditional retailers to increase their market share while enhancing the effectiveness of their business operations, as stated in (Mogoi & Osoro, 2022). Businesses that use the online sales channel do better overall and generate more revenue than businesses that don't. Intel Corporation asserts that businesses who invest in e-business reap the following six advantages: improved information management, improved supplier integration, improved channel partnerships, lower transaction costs, improved market comprehension, and wider geographic coverage. In a similar vein, research is produced with the aim of identifying the advantages of e-commerce and challenges in e-commerce. This research is based on secondary data, collected from published books, journals, research papers, magazines, daily newspapers, internet, and official statistical documents. It has been demonstrated that using e-commerce offers consumers a number of advantages, including access to a wide range of goods and services, the opportunity to shop around-the-clock from anywhere, cheaper goods and services, time savings, and information availability. Businesses are thought to fall behind if they don't use e-commerce technology (Kilay et al., 2022).

In procurement, the e-commerce have been adopted in the form of e-procurement and has been found to optimize supply chains. Nyile et al. (2021), they conducted a literature review study on the role of information technology in supply chain management. The study focused on transaction processing, supply chain planning and collaboration and order tracking and delivery coordination. The

empirical data collected indicated a positive relation between the technology variables and supply chain management. Transaction process automation reduced cost, increased volumes being transacted and eliminated human errors (Mogoi & Osoro, 2022). Supply chain planning supported cross-organizational collaborations whereas order tracking and delivery coordination helped in the consolidation and tracking of goods in transit. The study was however not backed with raw data to support the empirical findings deduced meaning that the study cannot be relied upon fully.

## 2.5 Performance of International Non-Governmental Organizations

The dynamics in the outlook of NGOs in Kenya have shifted in the last few decades as is happening globally. There is greater demand for demonstration of performance across all sectors including the private service (Mogoi & Osoro, 2022). NGOs have been put under greater pressure than ever to quantify their performance. This demand is not only coming from the donors who finance them, but also from other stakeholders including the communities they are serving. Kenyan NGOs are hence being forced to develop strategic directions, system management and internal data to demonstrate their performance.

Many researchers have developed metrics that can be used to evaluate the effectiveness of international NGOs. Resources, output, and flexibility measures can be used, according to Nyile *et al.* (2021), to evaluate the effectiveness, efficiency, and capacity for adapting to changing environments. On the other hand, he created a methodology for analyzing the financial success of international NGOs. The framework is made up of cost effectiveness, public support, and fundraising efficiency. In a similar vein, the Better Business Bureau's Standards for Charity Accountability developed a framework to evaluate NGO performance. According to their paradigm, performance is evaluated in terms of governance, efficacy, and financial factors. The model's representation of the financial component includes management, the creation of clear and accurate financial accounts, as well as budgets. It does not just focus on fundraising effectiveness. According to Mogoi and Osoro (2022), they acknowledged that American Association of Retired Persons (AARP) for developing an NGO performance evaluation model that includes organizational leadership and integration, resources and stewardship, as well as social impact value.

International NGOs in Kenya rely heavily on donor funds to launch their operations, which puts accountability on them (Nyile *et al.*, 2021). Periodic audits of these entities' procurement procedures are conducted with the goal of obtaining internal and external assurance of compliance with the value for money and accountability principles (Pocock & Whitman, 2016). Accountability, transparency, and value for money are therefore developing into fundamental principles for donors as a result of greater investment due to an increase in the frequency of disasters. The main responsibilities of international NGOs' supply chains include maximizing value for money, achieving efficiency and effectiveness, encouraging fair competition among vendors, and enhancing ethics, accountability, and transparency. This contrasts with the private sector organizations, whose main goal is profit maximization. The international NGOs have come under greater criticism from donors over the past ten years, who want to see evidence that they are accomplishing their goals effectively and efficiently. International NGOs organizations find themselves under more scrutiny when it comes to examining the impact of help, not just the intake and output but the complete business, as funders become more involved in spending (Nyile *et al.*, 2021). As a result, organizations need to improve their operations' result orientation, accountability, and openness.

### 2.1.1 Research methodology

This study applied descriptive research design. In a descriptive research method, participants answer questions administered through; filling, interviews or face to face response. After participants answering the questions, the researcher describes the responses given. In order for the survey to be both reliable and valid it was important that the questions are constructed properly. Reliability refers to the ability of a measuring instrument to give accurate and consistent result. It is consistency and explicability overtime and over groups (Kothari, 2011). Internal consistency was tested using the Cronbach's alpha statistic. Cronbach's alpha measures consistency within the instrument and assesses how well a set of items measures a particular behaviour or characteristic within the test (Ominde, Osoro & Monari, 2022). For a test to be internally consistent the estimates of reliability should be based on the average inter-correlation among all the single items within a test. Where Cronbach's Alpha coefficient is used for reliability test, the value should be above 0.7.

### 2.1.2 Descriptive Results for Inventory Optimization

Respondents were asked to give their opinion on inventory optimization in their respective organizations. From table 4.7, the respondents unanimously agree that inventory optimization ensured performance of international NGOs (M=3.721 SD=1.1481); Through Inventory Level Policies assessment the international NGOs in Nairobi City County have been able to make rational decisions on priority and non-priority projects (M=3.712, SD=.8041); inventory control assessment has contributed to the quality and innovation of the planning team (M=3.834, SD=.8113); The cost of holding stock is too high in my organization (M=3.162, SD = .8514). The management of our organization sets optimized re-order and safety stock levels for inventory (M=3.831, SD=1.1751); Our organization invest a lot of financial resources inventory and holding of stock projects (M=3.321, SD=.8011). These findings were inline with the study conducted by Mogoi & Osoro (2022) which found out that inventory management practices like re-order level,

economic order quantity, just in time, vendor managed inventory and activity based costing contributed greatly to the performance and service delivery levels of humanitarian originations in Kenya.

**Table 1.1 Inventory Optimization**

Statement	Mean	Std. Dev.
Inventory optimization enhances performance in my organization	3.822	1.1481
Through Inventory Level Policies assessment my organization has been able to make rational decisions on priority and non-priority projects	3.3712	0.8041
Inventory control has contributed to the quality and innovation of the planning team in my organization	3.3384	0.8113
Cost of holding stock is too high in my organization	3.162	0.8514
The management of our organization sets optimized re-order and safety stock levels for inventory	3.831	1.1751
Our organization invest a lot of financial resources inventory and holding of stock	3.621	0.8011

**2.1.3 Descriptive results for Performance of Internationals NGOs**

From the findings, respondents were in agreement that performance of internationals NGOs of Nairobi City County, Kenya is being affect by supply chain optimization strategies , they gave 63.1%; when asked about Customer satisfaction and its effect on procurement performance of international NGOs in Nairobi City County, Kenya they gave 78.9 %; When the respondents were asked to show their level of agreement on how level of live hood improvement affects performance of internationals NGOs of Nairobi City County, Kenya they gave 28%; When also the respondents were asked to show their level of agreement on their family sustainability affects performance of internationals NGOs of Nairobi City County, Kenya they gave 79.8%; growth of more income contributes to risk management on performance of internationals NGOs of Nairobi City County, Kenya they gave 72.6% and through contract management, operational performance measured by quality, flexibility, results to better income on procurement performance of international NGOs in Nairobi City County, Kenya they gave 86.3%. The findings is in line with the findings of Ominde *et al.* (2022) they observed that some of the factors that contribute to inefficiency in procurement as corruption, delayed payments, poor planning, procurement policy changes, insufficient use supplier evaluation low supplier participation and improper payment procedures negatively affects performance of internationals NGOs in Nairobi City County.



**Table 1.2: Performance of Internationals NGOs**

Statements	Yes (%)	No (%)
Live hood improvement can affect performance of Inter.NGOs in Nairobi City County, Kenya	63.1	26.9
Family sustainability can affect performance of internationals NGOs In Nairobi City County, Kenya	78.9	21.1
Growth of more income can affect performance of internationals NGOs in Nairobi City County, Kenya	28.1	71.9
Better outcome can affect performance of internationals NGOs in Nairobi City County, Kenya	72.3	27.7
Quality of supplies can affect performance of internationals NGOs in Nairobi City County, Kenya	85.9	14.1
performance of internationals NGOs in Nairobi City County, Kenya	83.3	14.7

**2.1.4 Model Goodness of Fit**

Regression analysis was used to establish the strengths of relationship between the performance of internationals NGOs of Nairobi (dependent variable) and the predicting variables; supplier information sharing, transport and logistics optimization, risk management and e-commerce optimization (Independent variables). The results showed a correlation value (R) of 0.724 which depicts that there is a good linear dependence between the independent and dependent variables. This finding is in line with the findings of Mogoi and Osoro (2022). They observed that this also to depict the significance of the regression analysis done at 95% confidence level. This implies that the regression model is significant and can thus be used to evaluate the association between the dependent and independent variables. This finding concurs with the findings of Okumu and Bett (2019), they observed that analysis of variance statistics examines the differences between group means and their associated procedures.

**Table 1.3 Model Goodness of Fit**

R	R2	Adjusted R	Std. Error of the Estimate
0.734	0.787	0.764	0.065

With an R-squared of 0.787, the model shows that supplier information sharing, transport and logistics optimization, risk management and e-commerce optimization can contribute up to 78.7% on performance of internationals NGOs of Nairobi County, while 21.3% this variation is explained by other indicators which are not inclusive in this study or model. A measure of goodness of fit synopsis the discrepancy between observed values and the values anticipated under the model in question. This finding is in line with the findings of Nyile *et al.* (2021).

### 2.1.5 Conclusion

Based on the findings, the study concluded that inventory control plays a significant role in supply chain optimization and consequently on overall performance of the international NGOs in Nairobi City County. Organizations that have managed to control their cost of holding stock and optimized re-order and safety stock levels for inventory have also managed to optimize their supply chain management leading to better performance. On the influence of procurement cost optimization and performance of international NGOs in Nairobi City County, the study concluded that by working with suppliers that are able to offer a variety of stocks, to the firms can enhance their performance. Supplier with a wide portfolio of products and services reduces the costs that are related to acquiring new supplier such as supplier appraisal costs. The study also concluded that adoption of integrated planning and execution systems, use of E-procurement supports process in supply chain management and simplifies the procurement process which enhances supply chain optimization.

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