OPERATIONS MANAGEMENT PRACTICES AND PERFORMANCE OF AGRICULTURAL NON-GOVERNMENTAL ORGANIZATIONS IN NAIROBI COUNTY

BY

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DECLARATION

I hereby declare that this is my original work and has not been submitted for any award at any other institution.

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DEDICATION

This research project is dedicated to the Almighty God for giving me the grace and strength to see that I have completed this course successfully. To my dear husband David, who has encouraged me through this academic journey and my children Lenny, Maxine, and Justin.

ABSTRACT

This study sought to determine the operations management practices applied by Agricultural NGOs in Nairobi County. To accomplish this goal, the study was guided by the following research objectives; determine the extent of application of operations management practices by Agricultural NGOs in Nairobi County; identify the challenges faced by Agricultural NGOs in Nairobi County applying OM practices; establish the relationship between OM practices and performance.

The study used an exploratory research design. The main focus of this study was 41 Agricultural NGOs in Nairobi County. A census was carried out due to the relatively small number of agricultural NGOs in Nairobi. This gave a good appreciation of the operations management practices that are applied. The study made use of primary data collected through a closed questionnaire whose respondents were heads of department or country.

This study concluded that Operations Management Practices implementations have a positive effect on performance in agricultural NGOs operating Nairobi County. Findings show that OM practices reinforce operations management by increasing efficiency and improving effectiveness. The findings further suggest that the type of activities and programs run by the organization determine the level of operations systems development. Engaging in development humanitarian operations as opposed to emergency operations gives an opportunity to build operations systems that can guide the running of the organization due to the reduced pressure in project implementation. Further studies can be carried out to establish whether poor performance of NGOs as a result of limited financial allocation to operational costs is causing declining donor fund in the developing countries despite rising needs.

TABLE OF CONTENTS

DECLARATION ..... **i**

ACKNOWLEDGEMENT ..... **ii**

DEDICATION ..... **iii**

ABSTRACT ..... **iv**

CHAPTER ONE: INTRODUCTION **1**

1.1 Background 1

1.1.1 Operations Management Practices 2

1.1.2 Operations Performance 5

1.1.3 Non-Governmental Organizations in the Agricultural Sector in Nairobi County 7

1.2 Statement of the Problem 8

1.3 Objectives of the Study 10

1.4 Value of Study 10

CHAPTER TWO: LITERATURE REVIEW **11**

2.1 Introduction 11

2.2 Operations Management Practices 11

2.2.1 Goods and Services Design 13

2.2.2 Process and Capacity Design 14

2.2.3 Location Strategy 14

2.2.4 Layout Design 15

2.2.5 Human Resource and Job Design 16

2.2.6 Supply Chain Management Practices 17

2.2.7 Inventory 18

2.2.8 Scheduling 19

2.2.9 Total Productive Maintenance 19

2.2.10 Quality Management 20

2.3 Operations Management and Performance 21
2.4 Empirical Studies on Operations Management Practices 22
2. 5 Conceptual Framework 24
CHAPTER THREE: RESEARCH METHODOLOGY 26
3.1 Research Design 26
3.2 Population of the Study 26
3.3 Data Collection 26
3.4 Data Analysis 26
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION 28
4.1 Introduction 28
4.2 Demographic Information 28
4.3 Operations Management Practices 28
4.4 Challenges of Implementing Operations Management Techniques 33
4.5 Impact of Operations Management Practices 34
4.6 Inferential Analysis 35
4.4 Discussion of Findings 39
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS 42
5.1 Introduction 42
5.2 Summary of the Findings 42
5.3 Conclusion 43
5.4 Recommendations 43
5.5 Further Research 44
REFERENCES 45
APPENDICES 50
APPENDIX I – POPULATION OF THE STUDY 50
APPENDIX II: QUESTIONNAIRE 55

ABBREVIATIONS AND ACRONYMS

ACF	Action Contre La Faim
AFSTA	African Seed Trade Association
AGRA	Alliance for a Green Revolution in Africa
BPR	Business Process Reengineering
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Centre
CIRAD	Agricultural Research Development
COOPI	Cooperatione Internationale
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
FAO	Food and Agricultural Organization
FSNWG	Food Security and Nutrition Working Group
GDP	Gross Domestic Product
GoK	Government of Kenya
IGAD	Inter-Governmental Authority on Development
ILRI	International Livestock Research Institute
INGO(s)	International Non-Governmental Organizations
JIT	Just – In – Time
KAMADEP	Kazi Mashambani Development Programme
KARI	Kenya Agricultural Research Institute
NGO(s)	Non-Governmental Organizations
ODA	Overseas Development Aid
OM	Operations Management
SNV	Netherlands Development Organization
TQM	Total Quality Management
UN	United Nations
VSF	Veterinaires Sans Frontières

CHAPTER ONE: INTRODUCTION

1.1 Background

Kanyinga and Mitulla (2006) state that it is widely recognized across the world, including Kenya, that the last two and a half decades have witnessed unprecedented growth in number and activities of private non-governmental institutions. Some of these organizations were formed to complement state services in response to the declining capacity of the state to carry out development. Some were formed to provide alternatives to the state in: – education, protecting the environment, health, economic activities, improving local water systems, and generally improving human welfare.

Thirteen percent of Overseas Development Aid (ODA) budget in 2014 was channelled through Non Governmental Organizations (NGOs) compared to 5% of the budget in 2006 (Development Initiatives, 2015). These statistics indicate an increase in funding of NGOs and this has led to the increase in the number of NGOs and the scope of their work in Kenya over the last decade from 4,099 in 2005 to 8,374 in 2012 (NGO coordination board: Strategic Plan 2013 – 2017). NGOs are perceived as being more effective in delivering development aid as well as being more flexible and responsive than governments and multilateral agencies. NGOs operate in complex development work and in difficult environments and it can thus be argued that they should have stronger and more developed management and operations structures than for-profit businesses (Macharia 2013).

Agricultural NGOs contribute towards supporting the government in achieving the vision 2030; specifically on achieving food sufficiency and reducing the poverty levels (Food

and Agriculture Organization (FAO), 2015). NGOs support the government in areas of research in agriculture and livestock, technology transfer in production and value addition, capacity building of small scale farmers on farming technologies and distribution of tools and seed with the aim of facilitating increased productivity (International Livestock Research Institute (ILRI), 2014). Considering that 75% of the Kenyan population is dependent on Agriculture for food and income (Kenya Agricultural Research Institute (KARI) 2013), support to the sector by NGOs has a direct impact on agricultural productivity and the overall Gross Domestic Product (GDP) of the country (Mwangi, 2013).

1.1.1 Operations Management Practices

In any organization, the operations unit handles the transformation process of inputs into outputs i.e. products and services (Waters, 2002). Operations management practices include: product and process design, supply network design, inventory planning and control, capacity planning and control, supply chain planning and control, enterprise resource planning (ERP), lean synchronization, project planning and control, quality management, layout, operations improvement, and risk management (Slack, Chambers, Johnston, 2010).

Process and capacity design is the activity which shapes the physical form and purpose of both products and services and the processes that produce them (Slack et al., 2010) and determines the output levels in the short and long term. The overall purpose of process and capacity design is to meet the needs of customers through achieving appropriate levels of quality, speed, dependability, flexibility and cost.

Supply chain management is a broad concept which includes the management of the entire supply chain from the supplier of raw material to the end-customer (Slack et al., 2010). Its component activities include purchasing, physical distribution management, logistics, materials management and customer relationship management (CRM). Supply network design helps any operation to understand how it can compete effectively within the network (Slack et al., 2010). It can also help to identify particularly significant links within the network and hence identify long-term strategic changes which may affect the operation. The effectiveness of the supply chain has a bearing on the effectiveness of the inventory management policies that can be adopted by the organization. The location of the operation can also be strategically selected taking into consideration the supply side influences (labor, land, utility cost) and demand side influences such as image, convenience for customers.

Heizer et al. (2013) describe forecasting as the use of quantitative and qualitative techniques to determine an approximate future performance, with the aim of helping managers makes decisions about resourcing the organization for the future. The layout of an operation is concerned with the physical location of its transforming resources (Slack et al., 2010), while capacity planning and control is the way operations organize the level of value-added activity which they can achieve under normal operating conditions over a period of time (Stevenson, 2014).

Hendrick & Moore, (1985) state that inventory management is important as almost all operations keep some kind of inventory, most usually of materials but also of information and customers on queues. Inventory occurs in operations because the timing of supply

and the timing of demand do not always match. Enterprise Resource Planning (ERP) is an enterprise-wide information system that integrates all the information from many functions that is needed for planning and controlling operations activities (Caddy et al., 1999). This integration around a common database allows for transparency and improved coordination.

Lean synchronization was originally called just-in-time (JIT) when it started to be adopted outside its birthplace, Japan (Slack et. al., 2010). It is both a philosophy and a method of operations planning and control. Lean synchronization aims to meet demand instantaneously, with perfect quality and no waste.

Quality management is a key concern of almost all organization (Ebrahimpour and Cullen, 1993). Some organizations have a separate function devoted exclusively to the management of quality. Good quality reduces the costs of rework, waste, complaints and returns and, most importantly, generates satisfied customers and by extension improving competitiveness. All operations, no matter how well managed, are capable of improvement (Lassiter, 2007). Continuous improvement aids an organization to achieve and maintain competitiveness is a continuously changing business environment (Vastag and Whybark, 1991)

Risk management is increasingly a concern of operations managers as the sources of risk and the consequences of risk are becoming more difficult to handle (McKone and Schroeder, 2001). Sudden changes in demand, bankruptcy of a key supplier, terrorist attacks, cybercrime, are real threats to normal smooth running of operations and new risks are coming up with changing technology. The consequences of such events are

becoming more serious because of the push for sharper cost-cutting, lower inventories, higher levels of capacity utilization, an increasingly effective regulation, and a very attentive media, making the cost of operational failure greater. So for most operations managing risks is not just desirable, it is essential.

The organisational structures of NGOs are often very similar to for-profit organisations, and many of the tools developed to strengthen businesses and make them more profitable are applied to NGOs to make them more effective and accountable (Walsh and Lenihan, 2006).

1.1.2 Operations Performance

Operations performance is the firm's performance measured against standard or prescribed indicators of effectiveness, efficiency, and environmental responsibility such as, cycle time, productivity, waste reduction, and regulatory compliance (Stevenson, 2014). Operations improvement, productivity tracking, engineered standards, and performance incentive programs are key means of achieving world class operations performance. Operational performance management (OPM) is the alignment of all business units within an organization to ensure that they are working together to achieve core business goals. At a strategic level, performance objectives relate to the interests of the operation's stakeholders. They relate to the company's responsibility to customers, suppliers, shareholders, employees, and society in general (Zhu and Sarkis, 2004).

By doing things right, operations seek to influence the quality of the company's goods and services. Externally, quality is an important aspect of customer satisfaction or dissatisfaction. Internally, quality operations both reduce costs and increase

dependability. Doing things fast, aims at operations seeking to influence the speed with which goods and services are delivered. Externally, speed is an important aspect of customer service while internally, speed both reduces inventories by decreasing internal throughput time and reduces risks by delaying the commitment of resources. By doing things on time, operations seek to influence the dependability of the delivery of goods and services. Externally, dependability is an important aspect of customer service and internally, dependability within operations increases operational reliability, thus saving the time and money that would otherwise be taken up in solving reliability problems and also giving stability to the operation (Mwangi, 2013).

Companies can influence the flexibility with which the goods and services are produced. Externally, flexibility can: produce new products and services (product/service flexibility); produce a wide range or mix of products and services (mix flexibility); produce different quantities or volumes of products and services (volume flexibility); produce products and services at different times (delivery flexibility). Internally, flexibility can help speed up response times, save time wasted in changeovers, and maintain dependability. By doing things cheaply, operations seek to influence the cost of the company's goods and services. Externally, low costs allow organizations to reduce their price in order to gain higher volumes or, alternatively, increase their profitability on existing volume levels. Internally, cost performance is helped by good performance in the other performance objectives.

1.1.3 Non-Governmental Organizations in the Agricultural Sector in Nairobi County

An NGO is a voluntary organization or grouping of individuals or organizations which is autonomous and not-for-profit (GoK, 2012). NGOs in the Agricultural sector in Nairobi coordinate their activities through the Food Security and Nutrition Working Group (FSNWG), co-chaired by Inter-Governmental Authority on Development (IGAD) and Food and Agricultural Organization (FAO) of the United Nations (UN) (FAO, 2015). The group offers a forum to build consensus on critical issues facing policy and intervention during emergencies. The FNSWG serves the regional government, donor, and non-government agencies and currently has a membership of 80 organizations composed of IGAD, UN agencies, NGO's, donors, and research institutions. These organizations engage in activities such as capacity building on best practices, seed and tool distribution, resilience building through cash injection and technology transfer, advocacy in policy issues, civil education, research and support in setting up of institutional structures at the county level (FAO, 2015).

Fourteen and a half percent of the Kenyan GDP growth in 2014 was from the Agricultural sector (Kenya National Bureau of Statistics, KNBS 2015). Contributions of the NGOs in the agricultural sector aid in increasing the impact of agriculture on economic growth, provision of alternative livelihood sources and increased food production.

Agricultural NGOs in research include ILRI, International Center for Tropical Agriculture (CIAT), International Maize and Wheat Improvement Center (CIMMYT),

International Potato Centre (CIP), African Seed Trade Association (AFSTA), and Agricultural Research Development (CIRAD). NGOs engaging in training and emergency intervention in agriculture include Technoserve, Action Contre La Faim (ACF), Alliance for a Green Revolution in Africa (AGRA), Cooperatione Internationale (COOPI) and Kazi Mashambani Development Programme (KAMADEP). Those specializing in livestock and value addition include Heifer International, Veterinaires Sans Frontieres (VSF), Netherlands Development Organization (SNV). A comprehensive list of Agricultural NGOs is in Appendix 1. Agricultural NGOs work in a major economic sector in Kenya supporting 75% of the population (GOK, 2013); hence increased efficiency in the sector through the use of OM practices would improve on their impact in the economy and society at large.

1.2 Statement of the Problem

In the financial year 2011/12, the NGO sector contributed an estimated KES 81 billion annually to the Kenyan economy (GOK, 2013). With this comes the responsibility to ensure transparency, efficiency and accountability of these funds to the donors and society.

Significant research has been done to understand many implications of NGOs in development, often done through the lens of analyzing state-NGO relations (Clark, 1995; Kameri-Mbote, 2000). According to Alymkulova & Seipulnik (2005) one of the greatest challenges facing non-profit organizations in Central Asia, particularly Kazakhstan and Kyrgyzstan, is how to sustain and support NGO activities financially. In Palestine, available data suggest that funding to NGOs fell by more than 50% in the second half of

the 1990s, and hence a need to adopt other strategies to ensure survival of organizations (Abdelkarim N., 2002). With donor funding increasingly not matching the requirements to respond to the many disasters in the world, humanitarian organizations are deepening forays into strategies that ensure their survival by increasing their competitiveness through efficiency and quality of service delivery (Rawlings, 2010).

A study has also been done to determine the relationship between the use of systems of operations in NGOs in Kenya and program performance (Muinami, 2013). This study did not look at the tools and practices adopted by the surveyed organizations in achieving their goals. Mwangi (2013), and Ng'ang'a (2014), studied the level at which NGOs in Kenya have adopted inventory and supply chain strategies, with an aim of maintaining optimal stocks and an efficient supply chain. Onsongo (2012) carried out a study on the financial strategies adopted by NGOs in Kenya as a response to the competition for donor funding coming about because of the increased number of NGOs in the country.

The level at which Agricultural NGOs in Nairobi County, Kenya, are adapting to environmental changes by embracing the use of operations management practices has not been studied. This study, therefore seeks to fill the gap and help in determining whether NGOs in the agricultural sector employ operations management practices in order to harness the benefits that accrue from their application. The research will endeavor to answer the following questions: Do Agricultural NGOs in Nairobi County apply operations management practices? Which operations management practices are adopted by Agricultural NGOs in Nairobi County?

1.3 Objectives of the Study

The general objective of this study was to determine the operations management practices applied by NGOs.

Specific Objectives were to:

1. Determine the extent of application of operations management practices by Agricultural NGOs in Nairobi County.
2. Identify the challenges faced by Agricultural NGOs in Nairobi County applying OM practices
3. Establish the relationship between OM practices and performance.

1.4 Value of Study

This study is of great significance to the Agricultural NGO sector in Kenya. To begin with, it is a basic research designed to contribute to better understanding of the operational practices in the sector and provide an understanding of the operational constraints and remedial measures to NGOs.

The academia and research institutions in the area of operations management will gain an insight on the operations practices applied by Agricultural NGOs in Nairobi as well as challenges encountered in the process of decision making and project implementation. This may open up the opportunity for further research on other aspects of operations management practices.

The results of this study will inform policy makers and the governments on improvements that may be required in the sector to further enable the NGOs achieve their mandates as well as streamline activities in the sector.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews research studies and information related to operations management practices.

2.2 Operations Management Practices

Operations management is concerned with creating, operating, and controlling a transformation system which takes inputs of a variety of resources and produces outputs of goods and services which are needed by customers (Nylor, 1996). It is the activity of managing the resources which produce and deliver products and services (Slack et. al., 2010). Every organization has an operations function because every organization produces some type of product and/or services However, not all types of organizations will necessarily call the operations function by this name.

Operations management evolved with the introduction of Frederick W. Taylor's systematic approach to scientific management at the beginning of the twentieth century (Inman, 2006). Until the end of the 18th century, agriculture was the predominant industry in every country (Dilworth, 1992). The advent of the steam engine and Eli Whitney's concept in 1800 of standardized parts paved the way for the Industrial Revolution with its large manufacturing facilities powered by steam or water (Slack et. al., 2010). A number of countries evolved from an agricultural economy to an industrial economy. But for a time, manufacturing was more of an art than a science. The introduction of Taylor's method of scientific management and Henry Ford's moving assembly line brought the world into an age where management was predominantly

centered on the production of goods (Schroeder, 1981). As operations management (OM) best practices have become mature, research on practices has begun to shift its interest from the justification of the value of those practices to the understanding of the contextual conditions under which they are effective (Rui and Voss, 2006)

According to Waters (2002), operations are the activities that are primarily concerned with making organizations produce products efficiently and effectively. These activities include layout, human resources and job design, supply chain management, scheduling, and maintenance. According to Slack et al (2010), there are five operations performance objectives which are cost, quality, speed, reliability and flexibility. Cost involves adopting a positive strategy of minimizing costs and supplying products at the lowest possible prices. Quality refers to the ability to produce in accordance with specification and without error. Speed is the ability to do things quickly in response to customer demands and thereby offer short lead times between when a customer orders a product or service to when they receive it. In reliability, companies' deliver products and services in accordance with promises made to customers without fail. The ability to change operations and meet specific customer requirements brings about flexibility. Flexibility comprises of four aspects of ability to change the volume of production, ability to change the time taken to produce, ability to change the mix of the different products or services produced, the ability to innovate and introduce new products and services.

Adoption of these operations management practices and excelling at one or more of them can enable an organization to pursue a business strategy based on a corresponding competitive factor (Barnes, 2008). Similarly, to be a world class company, one must no

longer view cost, quality, speed of delivery and even flexibility as tradeoffs but as essentials to any business function (Slack et. al., 2010). Operations management practices being the activities that are carried out are discussed below.

2.2.1 Goods and Services Design

The design of goods and services defines much of the transformation process (Heizer, 2008). The factors of cost, quality and human resources must be made during this stage. Operations management of goods and services is also different due to their different characteristics. Waters (2002) says that in reality every product is a package that contains goods and services. Organizations have to design every aspect of this package to give a product that customers want.

This process starts with product planning which is concerned with all the decisions about design and introduction of new products, changes to existing products and withdrawal of old products. Because customer demand changes over time, marketing and operations management need to work closely, to assess customer demands and suggest products that satisfy them (Waters, 2002). Demand for a product changes over time. It usually follows a standard life cycle which has five phases; i.e. introduction, growth, maturity, decline and withdrawal phases.

According to Waters (2002) a Product Life Cycle has four important consequences for the operations. First, organizations focus on different aspects of operations at each stage of the cycle. Costs, revenue and profit vary considerably, organizations with different expertise start and later stop making products at different points in the cycle and organizations make a range of products to smooth overall production.

2.2.2 Process and Capacity Design

Capacity planning and control is the way operations organize the level of value-added activity which they can achieve under normal operating conditions over a period of time (Stevenson, 2014). It is usual to distinguish between long, medium and short-term capacity decisions. Almost all operations have some kind of fluctuation in demand (or seasonality) caused by some combination of climatic, festive, behavioral, political, financial or social factors.

Manufacturing of physical products can easily be related to process and capacity design than services operation. However, the capacity design issue is critical for services because it will try to reduce waiting time and avoid loss of sales due to insufficient capacity (Slack et. al., 2010). For manufacturing capacity, design is based on a firm's capability, forecast for future and market demand (Heizer, 2004). According to UNIDO (2010) Kenyan domestic companies have low capacity utilization. It says most companies are running their production lines at a capacity of between 50-66 percent. Production costs per unit are therefore relatively higher and this impacts negatively on their ability to be cost competitive.

2.2.3 Location Strategy

Location is an area for operations management to critically consider. With globalization of business, operations managers too must think global (Slack et. al., 2010). For physical goods, location selection can be determined by a combination of qualified human resources, technology, raw material, access to market and government policy. For

services, as there is direct contact with customers, the location is determined by market accessibility or it should be as near to customer as possible.

Retail and service facilities are usually small and less costly than large industrial facilities. One of the most important factors in locating retail or service facilities is proximity to customers. In Kenya, banks have been streaming back to regions previously considered unprofitable so as to get closer to their customers. Construction costs tend to be less important, although rent or leasing costs can be high (Russell, 2007).

In recent years, US companies have begun to relocate to foreign countries to be closer to newly emerging markets and to take advantage of lower labour costs. Locally, companies consider the infrastructure and location incentives like government regulations. These techniques are often used to make location decisions. These are: location factor rating, centre-of-gravity technique and load-distance technique (Russell, 2007).

2.2.4 Layout Design

Facility layout refers to the arrangement of machines, departments, workstations, storage areas, aisles, and common areas within the existing or proposed facility (Russell, 2007). Layout decisions are important because they require substantial investments of both money and effort, involve long term commitments and have significant impact on the cost and efficiency of short term operations. Effective layouts minimize material handling costs, utilize space efficiently, utilize labour efficiently, eliminate bottlenecks, facilitate interaction and communication within the facility, reduce customer service time, eliminate redundant movement, facilitate entry and exit of people, materials and products (Stevenson, 2014). It also incorporates safety and security measures, promotes product

and service quality, encourages proper maintenance activities, and provides visual control activities ad increase capacity.

There are three basic types of production layouts, namely; process, product and fixed position layouts (Slack et. al., 2010). Process layouts group similar activities together in departments or work centres according to the process or functions they perform. A good example is a supermarket where electronics, clothes, utensils, stationery, cosmetics are all placed at different places. Product layouts arrange activities according to the sequence of operations that need to be performed to assemble a product. This type of layout is common in vehicle assembly and leads to efficiency and ease of use. Fixed position layouts are typical of projects in which the product produced is too fragile, bulky, or heavy to move like ships.

2.2.5 Human Resource and Job Design

Employees are the integral part in the total system design (Stevenson, 2014). Operations management must have a policy for setting labour standards that ease transition of skills, improvement of knowledge, skills and abilities, build a balance of work and life quality in an effective cost target.

For services, an extra area that operations management should touch is customers' relationship since they deal with them directly (Heizer, 2008). In Taylor's system of scientific management, a job is a set of all tasks performed by a worker: tasks are individual activities consisting of elements, which encompass several job motions (Russell, 2007). The 'Quality of Life' program was popularized by General Motors and tried by several other companies. These programs promoted good job design (Waters,

2002). They include horizontal job enlargement which give an employee a variety of tasks making the job more interesting and making the employee feel that he has actually achieved something. Job enrichment involves giving an employee control over their work and some supervisory responsibilities. Workers are also held individually responsible for quality and reliability, a function previously held by management. Job rotation enhances the skill level of workers providing them with a greater sense of self-worth. Finally the company should promote interaction and communication among workers and between workers and management. Job design involves task analysis, worker analysis and environmental analysis to improve worker productivity.

2.2.6 Supply Chain Management Practices

Supply chain encompasses all activities associated with flow and transformation of goods and services from raw materials stage through to the end use, as well as the associated information flows. Decisions that have to take place of what to produce what material to buy, from where, how is the cost and how is the delivery from supplier to final end customers, is on-time delivery and minimum cost possible. It is more critical in production and supply of goods than it is to services (Heizer, 2008). One of the company's main objectives is to align upstream flow of materials with downstream distribution so that it can respond to uncertainty in customer demand without creating costly excess inventory.

Information is the essential link between all supply chain processes and activities including suppliers, manufacturers, distributors, retailers and customers. Computer and real time technology allow online communication throughout the supply chain. Some of

the popular current applications of information technologies for supply chain management include electronic business, electronic data interchange (EDI), bar coding, internet and the wide world web.

2.2.7 Inventory

The objective of inventory management is to provide uninterrupted production, sales, or customer-service levels at the minimum cost (Slack et. al., 2010). For many companies, inventory is the largest item in the current asset category. Inventory problems can and do contribute to losses or even business failures. It is important to make the correct decisions on how and where the inventory level should be kept to keep long term customers satisfied, suppliers, material availability so as avoid not only disrupting production, but also contain costs. Inventory costs include carrying costs which is cost of holding an item in inventory, ordering costs which are the cost associated with replenishing the stock of inventory being held, while shortage costs occur when customer demand cannot be met due to insufficient inventory. Inventory control systems are used to determine how much to order and when to order at optimal costs.

Goods production are of more concern to manufacturers because they may have to keep raw materials, work in progress, order and final goods while services is not critical as it is directly produced and consumed simultaneously (Heizer, 2004). A company might keep large parts and materials inventory to meet variations in supply deliveries. Companies also purchase large volumes to take advantage of quantity discounts.

2.2.8 Scheduling

Scheduling specifies when labour equipment and facilities are needed to produce a product or provide a service (Russell, 2007). The objectives of scheduling include meeting customer due dates, minimizing job lateness, minimizing response time, minimizing completion time, reducing overtime, maximizing labour utilization, reducing idle time and minimizing work in process inventory.

Schedules are more formal in goods production and supply with short, medium and long term planning to accommodate customers demand. For services, the demand is more direct and volatile and often, the concern when it comes to human resources is the availability to meet current customers needs (Heizer, 2008). Labour is one of the most flexible resources. Workers can be hired and fired more easily than equipment can be purchased and sold. This flexibility is valuable but makes scheduling difficult. Service firms especially, spend an inordinate amount of time developing employee schedules (Russell, 2007). One way to avoid headaches of employee scheduling and improve customer response is to automate, just like the banking industry does with automatic teller machines. Realistic schedules, therefore, must reflect capacity limitations.

2.2.9 Total Productive Maintenance

Dependability of service is one of the performance measures by which a company can distinguish itself (Dilworth, 1992). To establish a competitive edge and to provide good customer service, companies must have reliable equipment that will respond to customer demand when needed. Total Productive Maintenance (TPM) is a holistic approach to equipment maintenance that strives to achieve perfect production with no breakdowns, no

small stops or slow running, no defects. It also values a safe working environment: no accidents. TPM emphasizes proactive and preventative maintenance to maximize the operational efficiency of equipment. Preventive maintenance consists of maintenance activities performed before equipment breaks down, with the intention of keeping it operating. Remedial maintenance consists of efforts to restore facilities and equipment to acceptable operating condition after breakdown. In evaluating maintenance policies a company may consider several options and tradeoffs, among them: centralized versus decentralized, use of contract versus in house maintenance, the number of standby machines to hold, repair versus replacement of defective equipment, individual versus group replacement, the amount of replacement capacity that should be kept available and the extent to which preventive and remedial maintenance should be used (Dilworth, 1992).

2.2.10 Quality Management

There has been a 'quality revolution' brought about by improved processes that can make products with guaranteed high quality which gives producers a competitive advantage, customers demand high-quality products and will not accept anything less, and high quality reduces costs (Waters, 2002).

The dimensions of quality primarily for manufactured products that a customer looks for in a product include performance, features, reliability, conformance, durability, serviceability, aesthetics and safety. In service, quality involves the following dimensions; time and timeliness, completeness, courtesy, consistency, accessibility and convenience, accuracy and responsiveness (Slack et. al., 2010).

Quality management is a key concern of almost all organizations (Ebrahimpour and Cullen, 1993). Some organizations have a separate function devoted exclusively to the management of quality. High quality goods and services can give an organization a considerable competitive edge. Good quality reduces the costs of rework, waste, complaints and returns and, most importantly, generates satisfied customers. Ebrahimpour et al (1993) further states that in the long run, quality is the most important single factor affecting an organization's performance relative to its competitors.

All operations, no matter how well managed, are capable of improvement (Lassiter, 2007). Operations improvement is now seen as the prime responsibility of operations management. The broad approaches to managing improvement include Business Process e-engineering (BPR), Six Sigma, Total Quality Management (TQM), and lean management. Continuous improvement aids an organization to achieve and maintain competitiveness is a continuously changing business environment (Vastag and Whybark, 1991)

2.3 Operations Management and Performance

The operations function plays a major role in: providing a product (goods or services) that is suited to the company's capabilities and for which there is a sufficient market; providing a product with consistent quality at a level that appeals to intended customers and serves their needs; providing products at a cost that allows an adequate profit and a reasonable sales price (Robb and Arthanari, 2008). Gupta and Marquez (2005), assert that, for an organization to be operationally successful, it must increase its productivity and minimize its costs. Mulwa (2000) notes that, for a firm to succeed, it must adopt

efficient and effective production processes, monitor and continuously improve those processes. The production costs of an organization must therefore be minimized while at the same time increasing productivity, capacity, reliability and availability (Al-Turki, 2011).

2.4 Empirical Studies on Operations Management Practices

OM practices refer to every procedure or methodological solution which is carried out on the shop floor and which is meant to improve the efficiency of production and logistic processes for industrial goods (Battistoni, Bonacelli, Callodon, 2013).

The adoption of Total Quality Management (TQM) has been shown to be positively associated with the improvement of general performance (Hendricks and Singhal, 1996), with a higher operation efficiency (Hendricks and Singhal, 1997) and with better financial results (Easton and Jarrell, 1998). Such a positive association increases in the manufacturing sector, when managers use a reward system actually based on OM process outcomes (Chenhall, 1997). Moreover, TQM's results are related in a positive way to a firm's market share in the manufacturing sector (Mohrman, Tenkasi, Lawler, Ledford, 1995), as enables optimal exploitation of economic assets and of human capital. The statistical tools offered to control the production processes can bring about a positive effect on the quality level and can also reduce production waste – this altogether leading to better economical results (Flynn and Sakakibara, 1995). In order to succeed with TQM it is important to train in quality management (Adam, Corbett, Flores, Harrison, Lee, Rho, et al. 1997).

Kaynak (2003) in his model shows a graphical representation of the relationships between performance and the most used practices in TQM. This model was validated by a survey administered to about 210 American companies, where results are consistent with previous studies on TQM (Das A, Handfield, Calantone, Ghosh, 2000), (Flynn, Schroeder, Sakakibara, 1995). Some elements included in TQM, are taken from other well-known OM techniques like JIT procedures and the fundamentals of Supply Chain Management (SCM) (Dello, Falsini, Schiraldi, 2013). The more efficiently JIT is applied, the more its culture is spread within the firm, the more tangible the impact (Fullerton and McWatters, 2001). Nevertheless, it is also extremely important for JIT to be integrated with all other business functions.

Another research investigated the relationships among the JIT elements and, acknowledged that individual practices did not influence the firms' performance significantly, except for Kanban (Giordano and Schiraldi, 2013). A model by Matsui (2007), with regard to JIT was validated by a survey administered to about 50 Japanese manufacturing companies and it was noted that JIT production systems positively affects the firm's performance and in particular that of its production sites. McKone, Schroeder, Cua, (2001) analysed the possible relationship between Total Productive Maintenance (TPM) and performance. Here, a survey of 117 production plants, located all over the world showed evidence of a strong connection among the principal OM practices.

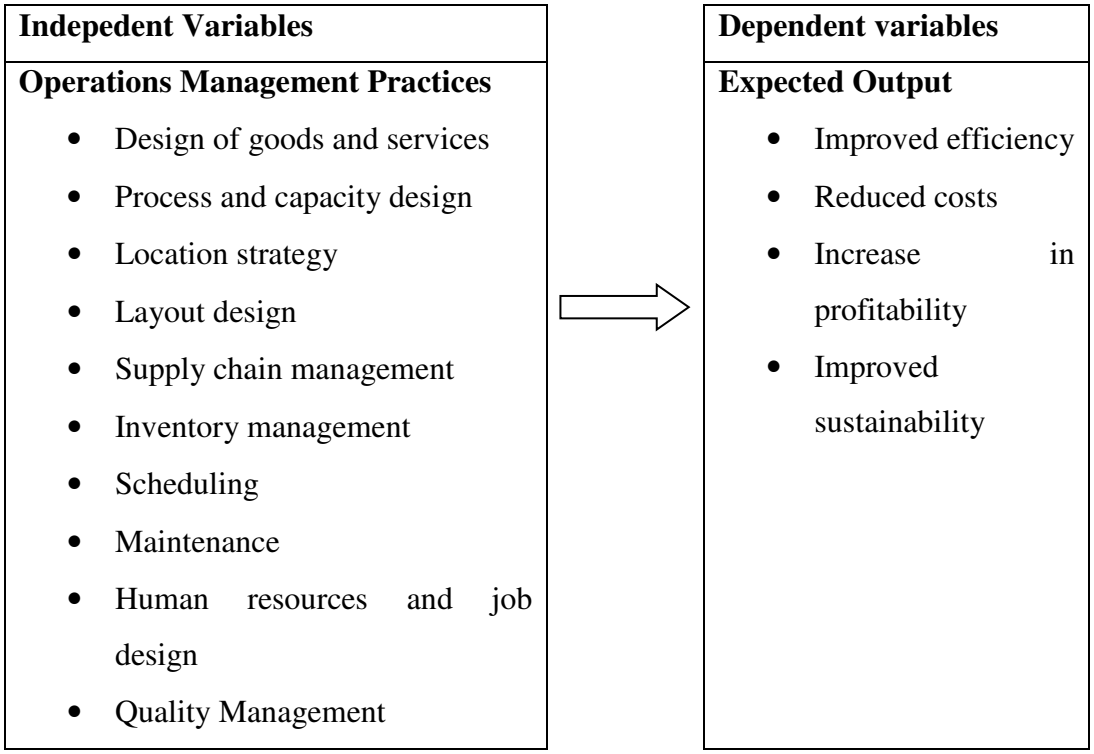
It can be concluded, from the literature, that the main OM practices can generate improvements in the performance of manufacturing companies; positive effects are even increased by the synergies emerging from the combined use of different approaches –

such as TQM, JIT, TPM and SCM optimization (Flynn et al., 1995) (Cua, McKone, Schroeder, 2001). New OM strategies should not focus on just one single technique, but should approach the firm as a complex system, where the interactions among elements are more important than each single element considered as a separate part of the optimization problem. Onyango (2010) in his study of the OM practices applied by pharmaceutical companies in Kenya noted that the adoption of OM practices in the pharmaceutical sector is in the infancy stage but its importance is appreciated. Macharia (2013) studied the effect of enterprise Resource planning systems on management accounting practices in NGOs and found that ERP systems' implementations have a weak positive effect on management accounting practices in NGOs operating in Kenya

2. 5 Conceptual Framework

Most organizations exist to improve profitability and growth. With proper adoption of operations management practices, companies tend to improve on efficiency and effectiveness that leads to growth and sustainability as presented in figure 2.1.

Figure 2.1: Conceptual Framework



Source: Researcher, 2015

The strategic adoption of operations management practices leads to an improvement in the efficiency and effectiveness of organizations and consequently leads to growth, profitability and sustainability.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This was an exploratory study designed to identify the extent to which agricultural NGOs in Nairobi County apply operations management practices. This was done through a survey. Surveys are concerned with describing, recording, analyzing and interpreting conditions that exist.

3.2 Population of the Study

The main focus of this study was 41 Agricultural NGOs in Nairobi County (Appendix 1). A census was carried out due to the relatively small number of agricultural NGOs in Nairobi. This gave a good appreciation of the operations management practices that are applied.

3.3 Data Collection

The study made use of primary data because it is efficient, flexible, accurate and inexpensive (Mugenda and Mugenda, 2003). The data was collected through a questionnaire targeting heads of department or country managers as they are well placed to understand the operations of the organization. Data collections from questionnaire were used in the survey. The questionnaires were dropped off and picked up later.

3.4 Data Analysis

The researcher organized, tabulated and summarized the collected data. Summary measures of mean and standard deviation were calculated for all questions in the Likert scale. Charts and graphs were used to illustrate the findings. Regression analysis will be

used to determine the relationship between OM practices and performance as shown in table 3.1.

Table 3.1: Summary of data analysis

Objective	**Section of the questionnaire**	**Analysis**
1. Determine the extent of application of operations management practices by Agricultural NGOs in Nairobi County.	Part A	Descriptive analysis
2. Identify the challenges faced by Agricultural NGOs in Nairobi County applying OM practices	Part B	Descriptive analysis
3. Establish the relationship between OM practices and performance.	Part C	Regression analysis

Source: Researcher, 2015

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The research objective was to determine the operations management practices and performance of agricultural non-governmental organizations in Nairobi County. This chapter presents the analysis and findings with regard to the objective and discussion of the same.

4.2 Demographic Information

A sample of 41 agricultural NGOs was targeted, however only 27 out of the 41 responded representing 66% and this formed the basis of the findings presented in this report. The findings are presented in narratives, charts and tables. The target population in this study were NGOs where the respondents targeted were senior level managers, middle level managers and supervisors in organizations. Respondents of the study also reported that their organizations have an operations department. When asked whether their organization have an operations plan, 86% of the respondents were in agreement that they have operational plan and 14% of the respondents did not.

4.3 Operations Management Practices

The study in this part aimed at identifying the extent at which agricultural non-governmental organizations have adopted operations management practices in each of the following activities as presented in Table 4.1.

Table 4.1: Operations Management Practices

	Mean	Standard deviation
Human resources and Job Design		
There is a system for collecting employees' opinions	4.3750	0.70484
Employees understand their duties and are never idle	3.8372	.37097
Employees full understand the goals, policies, and objectives of the organization.	4.7442	.48961
Employees have access to all the training they need	3.4419	.33356
Management gives priority to employees welfare	3.1628	.47372
There is a system for collecting employees' opinions	3.0465	.34548
There is a spirit of cooperation in the organization	4.9302	.43269
Supply Chain Management Practices		
Suppliers operate as separate entities with their own goals	3.4419	.29589
The company deals with a few prequalified supplier	4.8953	.25971
The organization collects feedback from the end users on how to improve on systems	3.0930	.31760
The organization provides technical assistance to suppliers and end users	3.3488	.38604
The organization can track and locate the movement of items	3.4186	.36306
Inventory Management Practices		
The organization uses computer software to manage its inventory	3.0465	.44548
Goods are distributed and not sold	2.9302	.23269
The organization places orders at specific times in the year	2.0000	.28680
Goods are ordered randomly depending on demand / needs	3.4419	.39589
Costs determine the amount of goods to be ordered	3.2558	.38961
Discounts offered is one of the considerations looked at when ordering goods	2.9302	.30357
Orders are placed depending on prior agreements with suppliers	3.4419	.29589
Maintenance		
Maintenance is done regularly	3.8372	.37097
Maintenance is done when there is less work or when equipment breaks down	4.7442	.48961
There is regular inspection of products and facilities	3.4419	.33356

	Mean	Standard deviation
Quality Management		
The organization has a quality management system in place	4.9302	.43269
The organization carries out studies to evaluate end user satisfaction	3.0000	.38680
The organization welcomes and acts on end user complaints	3.4419	.29589
Quality levels are determined by end user bench marks and the regulatory authorities.	3.4419	.29589
There is continuous improvement on handling of beneficiaries/end users	4.8953	.25971
Staff are continuously trained on and educated on quality programs	3.0930	.31760
Location Strategy		
Location is close to the end users	2.9628	.37372
Distribution, transportation and other utilities are easily accessible	3.0465	.44548
Location is determined by rent affordability and leasing costs	2.9302	.23269
Labor is easily available	2.0000	.28680
Scheduling		
The organization hires more workers when demand increases	2.9302	.30357
The organization increases or decreases working hours depending on demand	3.4419	.29589
Employees work overtime often to clear backlogs	3.2558	.38961
Process and Capacity Design		
The organization invests in systems with long term benefits	4.7442	.48961
The organization is able to respond to changes in demand quickly	3.4419	.33356
It is possible to forecast demand accurately	3.1628	.47372
Layout Strategy		
Departments are divided based on similarity of duties	3.0000	.38680
Divisions operate according to their geographical locations	3.4419	.29589
The layout is designed for ease of future expansion and improvement	3.4419	.29589
There is proper utilization of the space available	4.8953	.25971
It is easy for employees to communicate with one another	3.0930	.31760
The layout ensures safety of employees	3.3488	.38604

	Mean	Standard deviation
Design of Goods and Services		
Design of goods and services aims at complying with the legal requirements	2.9628	.37372
Aimed at making the products and services satisfy the needs of the end user	3.0465	.44548
Aimed at enabling the organization to achieve competitive advantage	2.9302	.23269
Aimed at minimizing cost of product and/or service delivery	2.0000	.28680

Source: Researcher, 2015

The results of descriptive statistical analysis for the operational management practices are presented in table 4.1. This measurement scale consisted of 10 items reflecting the Human resources and Job Design, Supply Chain Management Practices, Inventory Management Practices, Maintenance, Quality Management, Location Strategy, Scheduling, Process and Capacity Design, Layout Strategy and design of Goods and Services. Respondents were asked to provide answers on each item that was measured by a five point Likert scale ranging from 1 (very low) to 5 (very high). From the table mean and standard deviation were used to test respondent ideas where Standard deviation is the square root of the variance. It measures the spread of a set of observations. The larger the standard deviation is, the more spread out the observations are while mean is the arithmetic mean across the observations. It is the most widely used measure of central tendency, it is commonly called the average. The mean is sensitive to extremely large or small values. From the table Financial performance has the (mean=4.6442 and STD DEV= 0.72874) while the least indicated was Location Strategy has the (mean=2.41338 and STD DEV= 0.47485).

4.3.1 Application of Operations Management practices

Respondents were asked to indicate the extent of application of OM practices by non-governmental organizations in the agricultural sector in Nairobi County. Its results are shown in Table 4.2.

Table 4.2: Application of Operations Management practices

	Mean	Standard deviation
Human resources and Job Design	4.49	0.3025
Inventory Management Practices	4.83	0.4709
Maintenance	4.34	0.4896
Quality Management	4.04	0.3335
Location Strategy	3.96	0.4737
Scheduling	3.64	0.2454

Source: Researcher, 2015

From the findings, Standard deviation measures the spread of a set of observations and it is the square root of the variance. The larger the standard deviation is, the more spread out the observations are therefore maintenance has the highest standard deviation 0.0.4896 meaning that most of the respondent didn't agree to one notion. There was spread of ideas while the lowest standard deviation that there is scheduling 0.2454 while the other standard deviations are showed in Table 4.2.

Mean is the arithmetic mean across the observations. It is the most widely used measure of central tendency in table the means are above value 2.5 which is 50 percent of the scale therefore respondents of the study found all the statements to have a direct benefit in application of operations management practices by non-governmental organizations in the agricultural sector in Nairobi County.

4.4 Challenges of Implementing Operations Management Techniques

The study sought to find out the extent to which NGOs has encountered each of the listed challenges in implementing operations management techniques in non-governmental organizations in the agricultural sector in Kenya. The respondents were asked to rank the statements according to the level of importance. Study findings are shown in Table 4.3 below.

Table 4.3: Challenges of Implementing Operations Management Techniques

	Mean	Standard deviation
Lack of OM Practices has contributed to poor Operations performance.	4.29	0.3321
Training and development of employees will enhance operations performance of your organization.	4.34	.2762
Lack of partnership with suppliers ails organizations in attaining optimal Operations performance.	4.49	.2783
Lack of adequate funding hinders operations management practices implementation.	3.82	.5783
Stringent donor grant agreements hinder operations management practices implementation.	3.68	.6393
Some organizations are just there to receive funding and not implement any project rendering operations performance attainment irrelevant.	3.99	.4463

Source: Researcher, 2015

As Table 4.3 indicates, majority of the respondents agreed that there is lack of partnership with suppliers has contributed to poor Operations performance (4.49 mean score) and that lack of OM practices in organizations affect the attainment of optimal Operations performance (4.29 mean score). Training and development of employees will enhance operations performance of your organization (4.34 mean score), Lack of adequate funding hinders operations management practices implementation and relief demand is

affected by dynamic and Some organizations are just there to receive funding and not implement any project rendering operations performance attainment irrelevant (3.99 mean score).

4.5 Impact of Operations Management Practices

Respondents of the study were asked to rate the impact of operations management practices on the performance of non-governmental organizations in the agricultural sector in Nairobi.

Table 4.4: Impact of Operations Management Practices

	Mean	Standard deviation
Application of Inventory management techniques helps improve organizational supply chain performance by way of quantities required and when they are required.	4.17	0.6048
Maintenance management is necessary for organizations to attain optimal operational performance.	4.83	.3709
Seasonal goods require keen management and application of scheduling attaining organizational supply chain performance.	4.64	.4896
They say quality management helps organizations cut on waste and operational costs and improve customer satisfaction. Does this hold for your organization?	4.14	.3156
Training employees on operational management practices will improve the efficiency of the organization.	4.16	.3721

Source: Researcher, 2015

From the descriptive statistics presented in Table 4.4 show that the mean are above 2.5 for all the variables in impact of operations management practices, (4.14, 4.16, 4.17, 4.64, and 4.83) from the lowest to highest respectively in this order. Application of inventory management techniques helps improve organizational supply chain performance by way

of quantities required and when they are required, maintenance management is necessary for organizations to attain optimal operational performance, seasonal goods require keen management and application of scheduling attaining organizational supply chain performance. They say quality management helps organizations cut on waste and operational costs and improve customer satisfaction and training employees on operational management practices will improve the efficiency of the organization. The standard deviation show the spread of ideas of respondent and from the table the standard deviation ranges from 0.3156 to 0.6048 indicating that it is a small value thus respondents were agreeing to the same idea on the impact of operations management practices. Generally from the analysis operations management practices affect performance in agricultural NGOs in Nairobi County.

4.6 Inferential Analysis

The study sought to establish the relationship between operational management practices and performance of agricultural non-governmental organizations in Nairobi County. Pearson Correlation analysis was used to achieve this end at 99% and 95% confidence levels. The correlation analysis enabled the testing of relationship between operational management practices and operational performance. Table 4.5 shows significant, positive but good linear relationships between performance and: Supply chain management ($R = .845$, $p < .001$), layout design ($R = .783$, $p = .001$), location strategy ($R = .648$, $p < .001$), Process and capacity design ($R = .614$, $p < .001$), scheduling ($R = .693$, $p = .005$), human resource and job design ($R = .311$, $p < .001$), and quality management ($R = .214$, $p = .005$). The study noted that there was a strong positive linear relationship between each of the independent variables (Design of goods and services, process and capacity design,

location strategy, layout design, supply chain management, inventory management, scheduling, maintenance, human resource and job design and quality management) and operational performance.

Table 4.5: Correlation Analysis

	Operational Performance	
	Pearson Correlation	**Sig. (2-tailed)**
Operational Performance	1	0
Design of goods and services	.412*	0.003
Process and capacity design	.614*	0.008
Location strategy	.648*	0.002
Layout design	.783*	0.001
Supply chain management	.845*	0.002
Inventory management	.726*	0.009
Scheduling	.693*	0.005
Maintenance	.011*	0.004
Human resource and job design	.311*	0.006
Quality management	.214*	0.001

**. Correlation is significant at the 0.01 level (2-tailed). Source: Researcher, 2015

Multiple regression analysis was used to measure the relationship between operational management practices and performance of agricultural non-governmental organizations in Nairobi County. The regression model's goodness of fit was determined using overall correlation and the coefficient of determination between the independent variables and performance; that is, the strength of the relationship.

Table 4.6 presents a correlation coefficient of 0.933 and determination coefficients of 0.870. This depicts a strong relationship between operational performance and operational management practices. Thus, design of goods and services, process and capacity design, location strategy, layout design, supply chain management, inventory management, scheduling, maintenance, human resource and job design and quality management account for 87.0% of the variations in performance.

Durbin Watson (DW) test which checks if the residuals of the models were not auto correlated in order to determine the independence of the residuals produced a value of 2.009. It can, thus, be concluded that there was no autocorrelation.

Table 4.6: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0.933[a]	0.870	0.803	0.118373998	2.009

a. Predictors: (Constant), Design of goods and services, process and capacity design, location strategy, layout design, supply chain management, inventory management, scheduling, maintenance, human resource and job design and quality management
b. Dependent Variable: Operational Performance (Source: Researcher, 2015)

Analysis of Variance (ANOVA) was used to test the significance if relation exists between variables; thus, model's significance. The ANOVA results presented in Table 4.7 shows that the regression model has a margin of error of $p < .001$. This indicates that the model has a probability of less than 0.1 of giving false prediction; this points to the significance of the model.

Table 4.7: Analysis of Variance (ANOVA)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	26.390	10	2.639	3.072	.000b
Residual	13.744	16	.859		
Total	40.134	26			

a. Dependent Variable: Operational performance
b. Predictors: (Constant), Design of goods and services, process and capacity design, location strategy, layout design, supply chain management, inventory management, scheduling, maintenance, human resource and job design and quality management
(Source: Researcher, 2015)

Table 4.8 shows the regression coefficients of independent variables. The following regression model was established:

Operational performance = 2.039 + 12.3445* Design of goods and services -.002*Process and capacity design + 0.539*Location strategy + 5.311E-05*Supply chain management + 0.773 * Inventory management + 0.426* Scheduling + .989* Maintenance + 1.188* human resource & job design + 0.384*Quality management

From the equation, the study found that holding process and capacity design, location strategy, layout design, supply chain management, inventory management, scheduling, maintenance, human resource and job design and quality management at zero Operational performance becomes 1.3445. When all other variables are held constant a unit increase in process and capacity design results in a -.002 unit increase in operational performance while a unit increase in location strategy results in .539 unit increase in operational performance. A unit increase in supply chain management results in .773 unit increase in operational performance. A unit increase in inventory management results in .784 unit

increase in operational performance. A unit increase in scheduling results in .426 unit increase in operational performance. A unit increase in maintenance results in .989 operational performances. A unit increase in human resource management results in a 1.188 unit increase in operational performance while a unit increase in quality of management results in a .384 unit increase operational performance.

Table 4.8: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	2.039	.061		.635	.528
Design of goods and services	1.3445	.000	-.020	-2.797	.044
Process and capacity design	-.002	.005	-.044	-3.425	.013
Location strategy	.539	.001	.984	42.865	.000
Supply chain management	.773	.056	.047	3.8745	.011
Inventory management	.784	.476	.388	4.4487	.009
Scheduling	.426	.377	.287	4.8984	.006
Maintenance	.989	.684	.538	5.4794	.003
Human resource and job design	1.188	.748	.377	6.377	.002
Quality management	.384	.177	.087	4.1293	.010

a. Dependent Variable: Operational performance. Source: Researcher, 2015

4.4 Discussion of Findings

From the analysis of findings, it was established 86% of the respondents were in agreement that they have an operational plan and 14% of the respondents did not. From the tables mean and standard deviation were used to test respondent ideas where Standard deviation is the square root of the variance. It measures the spread of a set of observations. The larger the standard deviation is, the more spread out the observations

are while mean is the arithmetic mean across the observations. It is the most widely used measure of central tendency; it is commonly called the average. The mean is sensitive to extremely large or small values. From the table maintenance has the (mean=4.7442 and STD DEV= 0.48961) while the least indicated was Scheduling which has the (mean=3.0465 and STD DEV= 0.34548).

From the findings, Standard deviation measured the spread of a set of observations. The larger the standard deviation, the more spread out the observations are therefore maintenance has the highest standard deviation 0.48961 meaning that most of the respondent didn't agree to one notion. There was spread of ideas while the lowest standard deviation that there is stakeholders satisfaction at 0.33356.

Majority of the respondents agreed that lack of OM Practices has contributed to poor Operations performance (4.62 mean score) and that lack of partnership with suppliers ails organizations in attaining optimal Operations performance (4.05 mean score). Training and development of employees will enhance operations performance of your organization (4.33 mean score), Lack of adequate funding hinders operations management practices implementation and some organizations are just there to receive funding and not implement any project rendering operations performance attainment irrelevant (3.82 mean score).

Also noted from the descriptive statistics presented, that the mean are above 2.5 for all the variables in impact of operations management practices, (4.0750, 3.8372, 3.7442, 3.4419 and 3.1628) from the lowest to highest respectively in this order; Application of Inventory management techniques helps improve organizational supply chain performance

by way of quantities required and when they are required, Maintenance management is necessary for organizations to attain optimal operational performance, Seasonal goods require keen management and application of scheduling attaining organizational supply chain performance, They say quality management helps organizations cut on waste and operational costs and improve customer satisfaction and training employees on operational management practices will improve the efficiency of the organization. The dismal standard deviation indicated uniformity in the responses from the respondents.

A correlation coefficient of 0.933 and determination coefficients of 0.870 was noted in the model summary. This depicts a strong relationship between operational performance and operational management practices. Thus, Design of goods and services, process and capacity design, location strategy, layout design, supply chain management, inventory management, scheduling, maintenance, human resource and job design and quality management account for 87.0% of the variations in performance. Durbin Watson (DW) test which check if the residuals of the models were not autocorrelated in order to determine the independence of the residuals produced a value of 2.009. It can, thus, be concluded that there was no autocorrelation. From the analysis of findings, it was noted that each of the independent variables chosen for the study had a significant influence on operational performance on agricultural NGOs in Nairobi County.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of key findings, conclusion drawn from the findings highlighted and recommendation made based on the findings. The conclusion and recommendations are drawn towards addressing the research objectives of operations management practices and performance of agricultural non-governmental organizations in Nairobi County.

5.2 Summary of the Findings

The study revealed that operations management practices are the major function of humanitarian organizations. Other major supply chain services were inventory maintenance and logistics support. All the organizations interviewed had an operations management practices responsible for the procurement and distribution of goods and services.

Operations management practices challenges can be classified in terms of management related challenges, financial related challenges and operating environment challenges. The major management related challenges were inability to anticipate disaster, the fact that the operations management practices is not recognized, and is not given emphasis or integrated into the organization system support.

Financial challenges were identified as lack of capital investment in operations management practices, stringent donor rules and guidelines on financial policies, high cost of supplies during disaster periods and high level of uncertainty in demand, whereas

the operating environment challenges included poor infrastructure in areas of operation, geographic characteristics of the affected region, inadequate transportation modes and domestic barriers such as country specific policies. These included demand analysis for relief supply, adoption of technology in the supply chain, improving quality process by pre- qualifying the suppliers as well as training the staff on operations management practices and its benefits.

5.3 Conclusion

The study concludes that operations management a practice in NGOs is faced by numerous challenges such as uncertainty in demand during emergencies, and diminishing donor funding. The challenges are threatening the future of humanitarian actions as efficiency and effectiveness increasingly become the areas of competitive advantage. Engaging in development humanitarian operations as opposed to emergency operations gives an opportunity to build operations systems that can guide the running of the organization due to the reduce pressure in project implementation. The use of operations practices is seen to lead to continuous improvement of quality through training, business processes, documentation of processes, and generally adaptation of a quality culture. Organizations can use operations management practices to not only meet the end user expectation but competitively meet the donor requirements.

5.4 Recommendations

Based on the findings discussed, there is need for adoption of operations management practices and procedures. Most respondents appreciated the benefits of the use of operations management practices. This study therefore recommends that management

invests in the development and use of operations management practices. In addition, management should use effective communication in making employees understand the need for operations management practices.

5.5 Further Research

Since the study adopted an exploratory study design focused on the agricultural sector, it is possible that the findings may not reflect the challenges of operations management of other similar organizations in other sectors. It is, therefore important that further study be carried out on other sectors in the humanitarian field to establish whether similar scenarios exist. Further studies can be carried out to establish whether poor performance of NGOs as a result of limited financial allocation to operational costs is causing declining donor fund in the developing countries despite rising needs.

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APPENDICES

APPENDIX I – POPULATION OF THE STUDY

List of Agricultural NGOs in Nairobi

No	Name of NGO	Contact	Area of Interest	Location
1	Afforestation Agriculture Livestock Improvement & Soil Conservation Programme	Josphat C. Lumeagi 0722287757	Agriculture & Conservation	
2	African Agricultural Technology Foundation. (AATF)	P.O. Box 30709, 00100 Nairobi Tel: +254 20 4223700/3731	Agriculture & Technology	ILRI Campus, Nairobi
3	Arican Biotechnology Stakeholders Forum (ABSF)	Prof. Norah Olembo, Executive Director P.O. Box 6609, 00800 Nairobi; Tel: 4444558/4448762 Cell: 0720223244/0734333283; Email: absf@absfafrica.org	Agriculture Research, Biotechnology	Nairobi
4	African Conservation Tillage Network (ACT)	P.O. Box 10375, 00100 Nairobi; Tel: +254 20 4444252; Cell: +254 722751208; Email: info@act-africa.org	Conservation Agriculture for Improved Livelihood & Better Environment	KARI-NARL, Waiyaki Way, Westlands
5	Africa Crop Science-Kenya Chapter	Faculty of Agriculture – University of Nairobi	Agricultural Research	Nairobi
6	African Harvest Biotech Foundation International (AHBFI)	Josephine Kilei, Senior Administrator; P.O. Box 642, 00621 Nairobi; Tel: +254 20 4441113/5/6; Cell: +254 733635260/0724 256977	Research & Agricultural Development	White Field Place, School Lane, Westland, 3rd Floor entrance B
7	African Network For Agriculture, Agro-Forestry & Natural Resources	Email: anafe@cgiar.org	Forestry & Agricultural Research	United Nations Avenue, Gigiri C/o ICRAF. Nairobi

No	Name of NGO	Contact	Area of Interest	Location
	Education (ANAFE)			
8	African Seed Trade Association (AFSTA)	P.O. Box 2428,00200 KNH, Nairobi Tel: +254 20 2727853/2727860; Email: afsta@afsta.org	Agri-Business	Utumishi Co-op House, 1st Floor, Mamlaka Road
9	FARM Africa (Food & Agricultural Research Management – Africa)	Helen Altshul, Regional Director P.O. Box 49502, 00100 Nairobi Tel: +254 20 2731664/2732203/2732044: Cell:+254 721576531/0734721208; Email: info@farm-africa.org	Innovative Agricultural Technologies, Practices and access to markets	Argwing Kodek Rd. Studio House, 4th Floor, Nairobi
10	IFDC (International Centre For Soil Fertility & Agricultural Development)	P.O. Box 30772, 00100 Nairobi Tel: +254 20 8632724/20 Cell:+254 711965024 URL: www.ifdc.org	Agricultural Development	ICIPE Duduvile Campus, Kasarani, Thika Road
11	International Centre for Research in Agroforestry (ICRAF). World Agroforestry Centre	Jacinta Kimwaki, Information Officer P.O. Box 30677, 00100 Nairobi Tel: +254 20 7224000 /4178 Email: j.kimwaki@cgiar.org URL: www.worldagroforestrycentre .org	Transforming Lives and Landscape	United Nations Avenue, Gigiri
12	International Livestock Research Institute (ILRI)	P.O. Box 30709, 00100 Nairobi Tel: +254 20 4223000 Email: ilri-kenya@cgiar.org URL: www.ilri.org	Livestock Research	Old Naivasha Road
13	International Plant Genetic Resource Institute (IPGRI) – IPGRI-BIOVERSITY	Abigael Odanga, Senior Administrator P.O. Box 30677, 00100 Nairobi Tel: +254 20 7224000/4500/4514 Email: a.odanga@cgiar.org URL: www.ipgri.cgiar.org	Plant Genetic Resource and Research	United Nations Avenue, Gigiri C/o ICRAF. Nairobi
14	Kazi Mashambani Development Programme (KAMADEP)	Morris M. Isiye Tel: +254 056 30775 Cell:+254 721405630 Email: kamadep@yahoo.com Eustace Kiarie, National	Agricultural Development	Milimani Estate, Opposite Star Academy, Western

No	Name of NGO	Contact	Area of Interest	Location
		Coordinator		
15	Kenya Organic Agriculture Network (KOAN)	P.O. Box 72461, 00200 Nairobi Tel: +254 20 2610863 Cell:+254 722 2076301/0735721376 Email: URL: www.koan.co.ke koansecretariat@elci.org	Organic Agriculture	ICIPE Campus complex, Kasarani
16	The African Forest Forum (AFF)	G. Kowero P.O. Box 30677, 00100 Nairobi Tel: +254 20 7224000 Email: g.kowero@cgiar.org	Afforestation	United Nations Avenue, Gigiri C/o ICRAF. Nairobi
17	International Center for Tropical Agriculture (CIAT)	CIAT Africa Coordination P.O. Box 823-00621 Nairobi, Kenya Phone: +254 20 8632800, +254 721574967 Fax: +254 20 8632001 E-mail: r.buruchara@cgiar.org	Tropical Agriculture	ICIPE. Duduville Campus Off Kasarani Road.
18	Center for International Forestry Research (CIFOR)	P.O. Box 30677, 00100 Nairobi Tel: +254 20 7224000 United Nations Avenue, Gigiri C/o ICRAF. Nairobi	Forestry Research	Gigiri
19	International Maize and Wheat Improvement Center (CIMMYT)	Philip Doyo, Finance Manager P.O. Box 30677, 00100 Nairobi Tel: +254 20 7224000 United Nations Avenue, Gigiri C/o ICRAF. Nairobi	Maize and wheat Research	Gigiri
20	International Potato Centre (CIP)	P.O. Box 30709, 00100 Nairobi Tel: +254 20 4223000 Email: ilri-kenya@cgiar.org URL: www.ilri.org	Root and Tuber research. Agricultural research for Development	ILRI at Old Naivasha Road
21	International Crops research Institute for The Semi-Arid Tropics (ICRISAT)	Said Silim, Director Eastern and Southern Africa, ICRISAT P O Box 39063 Nairobi, Kenya http://www.icrisat.org/ Tel: +254 20 7224555 Fax:+254 20 7224001 E-mail: S.Silim@cgiar.org	Cereals and Legumes	United Nations Avenue, Gigiri C/o ICRAF. Nairobi

No	Name of NGO	Contact	Area of Interest	Location
22	Agricultural Research Development (CIRAD)	P.O. Box 30677, 00100 Nairobi; Tel: +254 20 7224000 http://www.icrisat.org/ Tel: +254 20 7224555 Fax:+254 20 7224001 E-mail: S.Silim@cgiar.org	Agricultural Research	United Nations Avenue, Gigiri C/o ICRAF. Nairobi
23	International Institute of Tropical Agriculture (IITA)	c/o ICIPE P.O. Box 30772-00100 Nairobi, Kenya Tel: +254-20-8632900 ICIPE. Duduville Campus Off Kasarani Road.	Agriculture	Kasarani
24	World Neighbors	Qureish Noordin, qnoordin@wneastafrica.org; 254 20 2713886	Agriculture	
25	Technoserve	Business Advisor (Moses kimani) ke-info@tns.org; 254-20-3754333/34/35	Agriculture and innovation	Kalson Towers, 8th Floor, The Crescent, West lands
26	Veterinaires Sans Frontieres Suisse	info@vsfsuisse.org	Livestock	Lavington
27	Veterinaires Sans Frontieres Germany	info@vsfg.org	Livestock	Kilimani
28	Veterinaires Sans Frontieres Belgium	info@vsfb.or.ke	Livestock	Lavington
29	Cooperazione Internationale (Coopi)	info@coopi.org	Agriculture and livestock	Westlands
30	Action Contre La Faim (ACF		Agriculture and nutrition	Ngong road
31	Alliance for a Green Revolution in Africa (AGRA)		Small holder agriculture	Lavington
32	CNFA		Agricultural Development	Gigiri
33	Save the Children	Duncan Harvey	Food Security, child protection	Westlands

No	Name of NGO	Contact	Area of Interest	Location
34	OXFAM	Nigel Tricks	Food security, Civil education & support, water, Medical interventions	Kilimani
35	GOAL Ireland	Jo Ryan	Food Security	Kilimani
36	Mercy Corps		Food security, Civil education & support, water	Kilimani
37	Concern Worldwide		Food security, Civil education and support, water	Westlands
38	German Agro Action		Food security, agricultural Technology transfer	Kilimani
39	GIZ		Agriculture, health, water	Riverside
40	SNV Netherlands Development Organisation	H. Duiker hduiker@snvworld.org	Food security, agricultural technology	Kilimani
41	African Development Solutions (ADESO)	Thomas Dwyer	Food security, Peace initiatives, alternative livelihoods	Lavington
Source: Food Security and Nutrition Working Group				

APPENDIX II: QUESTIONNAIRE

Kindly answer the following questions by ticking in the appropriate box or filling the spaces provided.

GENERAL INFORMATION

1. Position of the respondent: .....
2. Does our organization have an operations department? Yes [ ] No [ ]
3. Does our organization have an operations plan? Yes [ ] No [ ]

PART A: OPERATIONS MANAGEMENT PRACTICES

4. Indicate on a scale of 1 – 5 to what extent you agree with the following about your organization.

1 = Strongly Agree 2 = Agree 3 = Neither Agree nor Disagree

4=Disagree 5 = Strongly Disagree

	1	2	3	4	5
Human resources and Job Design					
There is a system for collecting employees' opinions					
Employees understand their duties and are never idle					
Employees full understand the goals, policies, and objectives of the organization.					
Employees have access to all the training they need					
Management gives priority to employees welfare					
There is a system for collecting employees' opinions					
There is a spirit of cooperation in the organization					

	1	2	3	4	5
Supply Chain Management Practices					
Suppliers operate as separate entities with their own goals					
The company deals with a few prequalified supplier					
The organization collects feedback from the end users on how to improve on systems					
The organization provides technical assistance to suppliers and end users					
The organization can track and locate the movement of items					
Inventory Management Practices					
The organization uses computer software to manage its inventory					
Goods are distributed and not sold					
The organization places orders at specific times in the year					
Goods are ordered randomly depending on demand / needs					
Costs determine the amount of goods to be ordered					
Discounts offered is one of the considerations looked at when ordering goods					
Orders are placed depending on prior agreements with suppliers					
Maintenance					
Maintenance is done regularly					
Maintenance is done when there is less work or when equipment breaks down					
There is regular inspection of products and facilities					
Quality Management					
The organization has a quality management system in place					
The organization carries out studies to evaluate end user satisfaction					
The organization welcomes and acts on end user complaints					
Quality levels are determined by end user bench marks and the regulatory authorities.					
There is continuous improvement on handling of beneficiaries/end users					
Staff are continuously trained on and educated on quality programs					
Location Strategy					
Location is close to the end users					
Distribution, transportation and other utilities are easily accessible					
Location is determined by rent affordability and leasing costs					
Labor is easily available					
Scheduling					
The organization hires more workers when demand increases					
The organization increases or decreases working hours depending on					

	1	2	3	4	5
demand					
Employees work overtime often to clear backlogs					
Process and Capacity Design					
The organization invests in systems with long term benefits					
The organization is able to respond to changes in demand quickly					
It is possible to forecast demand accurately					
Layout Strategy					
Departments are divided based on similarity of duties					
Divisions operate according to their geographical locations					
The layout is designed for ease of future expansion and improvement					
There is proper utilization of the space available					
It is easy for employees to communicate with one another					
The layout ensures safety of employees					
Design of Goods and Services					
Design of goods and services aims at complying with the legal requirements					
Aimed at making the products and services satisfy the needs of the end user					
Aimed at enabling the organization to achieve competitive advantage					
Aimed at minimizing cost of product and/or service delivery					

2 The extent of application of OM practices by non-governmental organizations in the agricultural sector in Nairobi County.

Please indicate by ticking (√) the extent to which the following operations management practices are applied in your organization as per the following scale of 1 - 5

1 – Strongly Agree, 2 – Agree, 3 – Neutral, 4 – Disagree, 5 – Strongly Disagree

	1	2	3	4	5
Human resources and Job Design					
Inventory Management Practices					
Maintenance					
Quality Management					
Location Strategy					
Scheduling					

PART B:

3 Challenges of implementing inventory management techniques in non-governmental organizations in the agricultural sector in Kenya.

Please indicate by ticking (√) the extent you agree on the statement below for control as per the scale of 1 – 5:

1 – Strongly Agree, 2 – Agree, 3 – Neutral, 4 – Disagree, 5 – Strongly disagree

Lack of OM Practices has contributed to poor Operations performance.					
Training and development of employees will enhance operations performance of your organization.					
Lack of partnership with suppliers ails organizations in attaining optimal Operations performance.					
Lack of adequate funding hinders operations management practices implementation.					
Stringent donor grant agreements hinder operations management practices implementation.					
Some organizations are just there to receive funding and not implement any project rendering operations performance attainment irrelevant.					

PART C:

4 Impact of operations management practices on the performance of non-governmental organizations in the agricultural sector in Nairobi.

Please indicate by ticking (√) on the appropriate statement as per the scale below:

1 – Strongly Agree, 2 – Agree, 3 – Neutral, 4 – Disagree, 5 – Strongly Disagree No.

Application of Inventory management techniques helps improve organizational supply chain performance by way of quantities required and when they are required.					
Maintenance management is necessary for organizations to attain optimal operational performance.					
Seasonal goods require keen management and application of scheduling attaining organizational supply chain performance.					
They say quality management helps organizations cut on waste and operational costs and improve customer satisfaction. Does this hold for your organization?					
Training employees on operational management practices will improve the efficiency of the organization.					

THANK YOU FOR YOUR TIME