

**EFFECT OF GREEN OPERATIONS AND OPERATIONAL  
PERFORMANCE OF FOOD AND BEVERAGE PROCESSING  
FIRMS IN MOMBASA COUNTY, KENYA**

**BY**

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## **DECLARATION**

This research project is my original work and has never been presented in any other university or college for the award of degree or diploma or certificate.

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**D61/65365/2013**

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## **DEDICATION**

To my family for encouragement and endurance at my absence from home during the study period. God bless you.

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## **ABBREVIATIONS AND ACRONYMS**

<b>EMC</b>	Environmental Management Capability
<b>EPA</b>	Environmental Protection Agency
<b>GDP</b>	Gross Domestic Product
<b>GOK</b>	Government of Kenya
<b>KAM</b>	Kenya Association of Manufacturers
<b>KEBS</b>	Kenya Bureau of Standards
<b>KNBS</b>	Kenya National Bureau of Statistics

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## **ABSTRACT**

The study set out to determine the effect of green operations and operational performance of food and beverage processing firms in Mombasa County, Kenya. The research design was a descriptive cross-sectional survey. The study population was the food and beverage firms operating in Mombasa County. The study resolved to seek data from production managers or operation managers from the 55 firms through census. This data was obtained from the business register of Mombasa County Government as of October 2016. Primary data was collected using questionnaires. The study had a response rate of 67%. Data was subjected to normality test using Shapiro-Wilk and it was found to be normal. Correlation analysis was conducted at 5% level of significance and it was found out that the green operations correlation with operational performance was positive and significant. Increase in green operations leads to an increase in operational performance. The study was limited to firms in Mombasa County and therefore recommended similar research to be done in other firms in the industry.

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the Study**

The word “Green” is mostly used to represent brand positioning strategies among firms, for example use of organic materials, energy efficient technologies or even being environmentally friendly (Parker, Redmond, & Simpson, 2009). Many companies worldwide are embracing the idea of “greening the industry” for several reasons among them being to secure themselves against applicable legislation, response to green consumer demands as well as competition in the industry (Grant, 2008). Green operations can be defined as “operations that conserve or products that cause little damage to the environment, since the products are biodegradable and environmentally safe.” (Tzschentke, Kirk. & Lynch, 2008). “Green operations include use of renewable energy, water conservation, implementation of recycling policy, remanufacturing, use of biodegradable materials and green packaging among others”. Increase in environmental protection awareness and demand to reduce economic burden on industry is leading organizations to re-evaluate their corporate, business and operations strategies.

According to Elan, (2009); Hu, & Hsu, (2010); Tzschentke et al., (2008) Implementing green operations is a necessity for every organizations that want to gain a competitive advantage in the long run. Globally the concept of green operations is receiving increased attention among industries as a means of attaining competitiveness. Market demands, pressure from non-governmental organizations and public legislations require businesses to become more renewable and eco-friendly. Guide & Srivastava, (1998) claim that “expanding public legal framework and stable public precept for

environmental conservation has elevated these practices to high levels of management and decision making.

This study was rooted on three theories which include: The stakeholder theory which argues that stakeholders can influence green operations adoption by exerting pressure on firms to decrease or eliminate the damaging effects on environment and increase beneficial effects (Zhu, Sarkis& Lai, 2011). Resource based view which postulates that reliable competitive advantage and improved performance by a firm may be realized by exploiting resources which are rare and non-substitutable (Crook, Ketchen, Combs & Todd, 2008). Thus focus on green operations as a valuable resource can lead to a firm's competitive edge. The Institutional theory equally explores to what extent and organization tackles green environment matters, which are occasioned by outward forces (Jennings &Zandbergen, 1995). This theory inquirers into how authoritative guidelines for social behaviour are adopted and diffused over time. Thus it focuses on the direct impact of institutional norms, guidelines, and sanctions on organization to adopt green operations.

In Kenya, food and beverage processing sector takes the largest components of manufacturing industry. The sectors contribution to Gross Domestic Product is above 30 %) as reported by the Kenya National bureau of statistics, 2015. Though the sector is faced with various challenges including; high production cost, slow development of policies as well as poor and inadequate implementation of the policies, use of obsolete technologies and skills, high competition in the industry among others. Hence, adopting green operation initiatives could help this sector address these challenges and curb the increasing negative environmental impacts associated with their operations.

### **1.1.1 Green Operations**

Green operations can be defined as efficient and effective utilization of resources of an organization in the creation of goods or services by integrating sustainability into operations. According to Tzschentke, Kirk & Lynch,( 2008) Green operations refers to environmentally friendly operations and eco-friendly manufacturing and production. From the above discussion green operations require commitment by firms to various ecologically sound practices such as eco-friendly technologies, recycling, and energy conservation measures, solid and liquid waste management as well as pollution reduction and offsetting (Manaktola&Jauhari, 2007). The ultimate goal of green operations is to continuously improve conservation measures such as reuse and re-cycle and remanufacture (Chen, Watson, Bondreau&Karahanna, 2011).

According to Zhu et al., (2008) green operations draws its roots from the following construct: first, green purchase and supply logistics, related to the corroborative choice and access of commodities that reduces dismissive environmental effects over their life time most efficiently. Secondly, green production logistics which involves the use of safe manufacturing technology, efficiency in utilization of resources, energy conservation and pollution reduction; thirdly, green sales logistics related to maximization of transit ways and the establishment of a “green sales” structure; fourthly, reverse logistics, relates to programming, performance, and managing efficient, cost effective movement of inputs throughout the production operation and back. Adopting green operations leads to good organization`s reputation and provides a point of differentiation (Carlson & Ripley, 1997). Additionally, it leads to reduced manufacturing and operating costs (Porter & Van der Linde, 1995). According to Davis & Holt, (1993), implementation of green operations requires huge investment and top level commitment by the management. Apparently, customers are ready to

pay for the premium if the benefits outweigh the cost of investment (Laroche, Bergeron, & Barbaro-Forleo, 2001). Conclusively, food manufacturing firms cannot ignore green operations in winning the war against environmental degradation and resource exhaustion.

### **1.1.2 Operational Performance**

Narasimham, Misra & Das, (2001) define operational performance as “the strategic dimension by which a company chooses to compete”. According to Qureshi, Kumar & Pradeep, (2007), It’s the technique of determining the advancement in attaining set objectives, including information on efficient utilization of resources that are converted into products both goods and services. Delivery of products and level of customer satisfaction indicate the quality of the operation. Zhu, Sarkis and Lai (2008) outlines operational performance indicators as, amount of goods delivered on time, reduced scrap rate, product quality, and faster response in delivery, reduced costs and capacity utilization. Operational performance therefore takes into consideration the company’s performance in achieving its basic objectives (Russell & Taylor, 2008). “Improved operational performance is anticipated to promote an organization’s competitive edge, through price/cost, quality, reliability, marketing time, output innovation, customer lead times and inventory levels”.

Green operations components contribute to improved operational performance through increased financial performance, lead time performance, improved responsiveness, customer loyalty, innovation, quality products, and reduction in excess inventory levels. Integrating cost reduction concerns into operations has highly become important for companies to attain a superior organizational performance (Rao and Holt, 2005; zhu et al, 2008).

### **1.1.3 Green Operations and Operational Performance**

Gupta and Sharma (1996) argue that green operations are rooted in sound ecological principles in which the top level management effectively transform resources into environmental friendly products and services. According to (Steger, 1993), implementing green operations will lead a firm to save cost, increase market opportunity, utilize resources efficiently and prevent pollution on environment. This places a firm in a better place to comply more with regulations and legislations that apply, increase their reputation and boost their employee morale.

Taylor & Buttel, (1992) argues that businesses which embrace green operation are likely to see a positive change in their operational performance through significant decrease in operational cost and effective utilization of resources which in turn results to environmental protection. Issues such as disputes, environmental accidents, ban or loss from customer boycott may never arise. Thus operational excellence is actually a necessity rather than a desired end state for any firm envisioning future sustainability. Food and beverage processing firms have no choice but to integrate green operations into their processes as early as possible to begin reaping the benefits as well as optimizing the operational performance.

### **1.1.4 Food Processing Industry in Kenya**

This sector is one of the most productive and most relied upon among other sectors for economic growth and development. It promises immense potential for wealth creation, employment opportunities and resource application. It's a rapidly growing sector with many small and medium enterprises coming up. Ballooning population has seen the demand for food and beverage products triple attracting many investors to tap into the ready market and meet the insatiable population demands.



This has brought with it surmountable challenges leading to adverse effect on the planet resources raising the question of future sustainability. Examples of such challenges include but not limited to; high production cost resulting from high energy consumption, increased labour and transport costs, slugging development, poor implementation of policies, use of obsolete technologies, schemes and skills, competition from sartorial association and environmental exhaustion. These challenges need to be addressed with speed to salvage exhaustion of the natural resources and ensure future generations will be able to enjoy environmental benefits with fewer struggles. Initiating green operations into firm strategic decisions can help address these challenges among other benefits.

### **1.1.5 Food Processing Firms in Mombasa County**

Mombasa County is the hub of industrial activities in the entire coastal region. It accounts for 90% of the establishment and employment opportunities (Mwaguni&Munga, 1997). Data from Kenya Association of Manufacturers (KAM, 2015) asserts that there are 187 food and beverage processing firms in Kenya. About 35 per cent of these are registered and operating in Mombasa County. This study was set out to determine effects of green operations on operational performance on the aforementioned context focusing only on the firms in Mombasa County. The county is located along the coastal line of the Indian Ocean in Kenya. This makes it prone to human activity pollution with most of the industrial solid waste and other contaminated liquid discharges finding its way to the ocean. In fact, coastal and marine resources such as fishing activities, beaches, coral lagoons and marine life are under relentless pressure from population outburst and raging industrial pollution (Mwaguni & Munga, 1997).

This heavy pollution loads from industrial establishments such as millers, processors and manufacturers are channelled to the ocean base causing a negative effect on the entire ecosystem of plant, wild and human life. Solid wastes from service sectors like hotels and hospitals are not well sorted and treated before being deposited at the ocean base line releasing toxic and potentially hazardous refuse to animal and human health (Mwaguni & Munga, 1997).

As populations grow and economies expand natural resources are depleting rapidly causing tremendous challenges (Esty & Winston, 2009). Manufacturing and service firms are becoming more associated with adverse environmental impacts, (Gallopoulos, 2006). Manufacturing companies in Mombasa County have not been spared either and are linked to serious negative environmental impacts. The firms face various challenges such as lack of sustainable energy, poor management of solid and liquid wastes, use of obsolete technologies and skills and inadequate compliance with environmental regulations. Corrective remedy is required to attain a pivotal change generally in the society and particularly among the industries in order to include future sustainability (Lisney, Riley & Banks, 2003). Therefore adoption of green operations initiatives is not an option for food processing industry but a crucial requirement in the effort to help salvage earth`s extiquishing natural resources.

## **1.2 Research Problem**

Today`s business environment is in dynamic state of change. Business operations are impacted by changing customer demands, changing demographics and environmental regulations. For this reason, companies need tools and techniques that allow them be more flexible and adapt quickly to such to survive uncertainties. Green operations are one such concept that cannot be ignored. Managers have to adopt green operations to reduce the effect of their operations on the environment (Smith & Melnyk, 1996). A

green operation is a global widely applied concept whose ultimate target is to ease environmental burden (Gupta, 1995). Adoption of green operations results in the proper utilization of scarce resources while keeping the environment free from harmful products. B.Dipietro, Cao and Partlow, (2013) conducted a study on green practices in upscale foodservice operations. They found out that customers believed that they are informed of green operations though they desire to learn more about them. Consumers also showed more preference to those restaurants that were environmentally conscious and used environmentally safe products. This study recommends that more studies be done in regard to green operation and consumer responsiveness across various contexts. In another study, Szuchnicki (2009) evaluated, "the relationship between importance of green practices in restaurants and customers intention to return". The findings were that, "green practices were indeed important to customers and that they affect return intention". Respondents showed more concern for green restaurant operations, next was environmental protection and minimization of carbon emissions. This reveals the urgent need to create more awareness on green initiatives across industries through research in both service and manufacturing sector.

Nyakundi (2013) did a study on, "extent of Green Manufacturing Practices' adoption by food processing firms in Mombasa County, Kenya". The results obtained indicated that green manufacturing practices adoption was at implementation stage as most food processing firms had considered adoption. The study also established that the major perceived benefits of adopting green manufacturing are; reduction of waste water, reduction of frequency of environmental accidents and reduction in scrap rate. He recommended more studies on this context citing scarce literature on the industry greening. Kariuki (2014) investigated, "the relationship between green operations

practices and Operational Performance of Hotels in the Coastal region in Kenya” and revealed that there are positive results for firms implementing green operations. However he recommends more work be done in promoting green thinking, green awareness and green adoption not only in hotel industry but also other sectors of the economy. A review of the past studies reveals little literature on green operations concentrating in the context of food and beverage processing firms. This study set out to investigate the effect of green operations on operational performance of food processing firms in the County of Mombasa.

### **1.3 Research Objectives**

The specific objective of this study was:

To establish the effect of green operations on operational performance of food and beverage processing firms in Mombasa County.

### **1.4 Value of the study**

This study provides insights on the formulation and enforcement of rules, regulations and legislation based on environmental conservation. Authorities such as NEMA and other non-governmental organizations will draw valuable information concerning the manufacturing and processing sector which will help them understand how they can better discharge their roles on environmental matters and how they can provide support to the industry in promoting sustainability issues. Policy formulation and implementation is only effective in the availability of adequate information.

Conserving the environment and keeping it clean encourages businesses to thrive while creating opportunities for future generations. This study adds value to the resource based view asserting that the natural environment is a rare valuable resource

which if well tapped and efficiently utilized will not only create a competitive advantage but also promote future sustainability.

This study will enhance the promotion of green operations awareness to the general to society especially arousing environmental consciousness among consumers and purchasers of green products and services. It particularly points to the management of food and beverage processing firms that green operations result into enormous cost saving and strengthens brand image thus such should be included in the corporate strategic plan and be supported by all other functions of the organization

Further the body of operational management discipline will draw valuable contribution especially in the more demanding concerns of “Greening industries” and attaining sustainable environmental practices. The understanding of the green operations will provide knowledge on how various processing firms can contribute towards conservation of environment. Additionally, the findings from this study can be used as a source of secondary data for further study by other scholars.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

The objective of this chapter focused on the view of the literature by other scholars and researchers. It provides a review of the relevant studies on the topic. It presents an overview of the concept of green operations as a game changer in attaining organizational success and the different strategies used in achieving operational performance.

### **2.2 Theoretical Foundation of the Study**

This study was rooted on three theories namely: Resource based view, stakeholder's theory and institutional theory. This is because theories can be used to explain the relationship between an organization and the factors that contribute to its performance.

#### **2.2.1 Resource Based View**

This theory postulates that for a company to gain steady competitive edge it has to employ resources that cannot be easily imitated by its competitors (Russo & Fouts, 1997). In addition, for the firm to sustain the competitive advantage its capabilities should be supported by limited resources that are non- substitutable, unique, and customer satisfaction. Green operations strategies are such type of a resource and firms cannot overlook them if they want to survive in a global competitive market. Green operation activities requires a push from the top level management, incessant research, innovation in environmental technologies, players corroboration as well as full compliance with the applicable regulations in minimizing the environmental effects. Ultimately the goal is to achieve competitive edge such as improved manufacturing efficiency and a positive reputation by influencing future industry

standards. To pursue these green strategies a firm requires long term investment and long term vision on the environment as opposed to the quick gains from short term investment.

The organizational shared vision of the future requires a strong leadership and an empowering social process inside the firm which then becomes a firm's specific resource that cannot be imitated by competitors (Esty & Porter, 1998). This theory supports planning, implementation and control of strategies that can lead to the improvement of operational performance. In this case green operation strategies are geared towards protecting the environment not only for future sustainability but also increase a firm's profitability and protect its green image. However, according to (Priem & Butler, 2001), the resource-based view has a constraint in that it does not address administrative implications or operational efficacy i.e. it explains how management develops and acquires strategic means that meet the standards of being profitable, scarce, unique and how conveniently an organization can be formed but no demonstration on how management can achieve the same (Connor, 2002).

### **2.2.2 Stakeholders Theory**

Gibson (2000) describes stakeholders as "any party who can have an input or is influenced by the processes, resolutions, guidelines, operations or objectives of the firm". According to Freeman (1994) stakeholders refers to "any person who can affect or is affected by accomplishment of the organizations goals". Stakeholder theory has been presented both within the framework of organizational theories and within that of business ethics as a step beyond the neo classical theory where the goal of the firm is to profit and create wealth to the shareholders only (Rasi, Abdekhodae & Nagarajah, 2014).

People are gaining more awareness of the environmental impact of human actions and therefore many are resolving to make behavioral changes for the sake of the environment. Consumers and producers have realized that combining efforts together they can create a difference in protecting and preserving the environment (Wong, 2012). As major shareholders screen the short-term and long-term risks and opportunities in the target environment, all stakeholders must be prepared to justify their environmental actions. Going green can affect an entire organization hence the need to get as many stakeholders involved as possible. Ideally, poor environmental decisions will lead to bad company's relationship with its stakeholders. Therefore, the success of companies aiming to implement green operations initiatives strongly depend on the cooperation of their stakeholders. Technology and globalization has led to increased consumer awareness on the benefits of green product and services and this has led to them to demand industry improvement on their environmental performance (Buysse & Verbeke, 2003).

Moreover, with the emergence of green and eco-friendly commodities, customers are ready to pay more (price) for green products (Vandermerwe & Huillier, 1989) e.g. consumers can now reject the products of companies with negative environmental management reputation (Greeno & Robinson, 1992). Similarly suppliers are choosing to eliminate supply chain partners who are not environmentally conscious in order to protect their own reputation (Henriques & Sadorsky, 1999). One challenge of the stakeholder theory is the inability for management to please all the interested parties concurrently. For example, one group may express desire to an organization's success or failure and management cannot satisfy all these divergent desires at the same time.



### **2.2.3 Institutional Theory**

This theory stresses the part played by social and cultural norms subjected to a firm that influence a firm`s practices (Scott, 1992). “Therefore, a firms may tend to adopt green operations in response to institutional pressure dependent on either environmental master plan of conformance that focus on observing the laws or to minimize environmental impact of practices not within the legal framework” (Sharma, 2000). The firm can also include environmental management as a key performance indicator in employee performance or can also choose to work with their stakeholders to advance their environmental performance (Nelson & Winter, 2002).

Pressure is exerted in the food processing industry to be friendlier to the environment from various institutions. These include consumer demands, increased environmental laws, management of ethical drive, enhanced customer need fulfillment and the demand for beauty. However, although firms perform effectively with corporate backing, this theory is susceptible to isomorphic pressures.

### **2.3 Components of Green Operations.**

The key management functions include; finance, marketing, operations and human resource. Among these, greatest contributor to the environmental effects is the function of operations since it deals with the production of goods or services thus producing the biggest chunks of waste to the environment. Organizations are therefore called upon to look for ways of minimizing environmental harm originating from their operations. This can be done through environmental management programmes as well as good formulated policies (Gupta, 1995). Green operations components are valuable tools that enable a company to embrace sustainability.

### **2.3.1 Green purchasing**

Green purchasing is the acquisition of commodities sufficiently decreases adverse effects on environment over their life time. Green purchasing begins from the pre-design stage through manufacturing, transportation, use, recycling and disposal of a product (Gupta, 1995). Green purchasing considers environmental aspects when making buying decisions. Shrivastava, (1995) affirms that, “the eventual objective is to minimize the environmental effects of acquiring and raise efficiency of resources”. Such effects may relate to whichever level in the design, production, and use or scrapping of a product. Tuitoek (2007) in her research stated that, “environmental life process tests of products reveal that environmental effects build when a product is consumed are in most times higher than the ones from manufacturing of products”. Generally, more efforts by buyers are needed to raise the environmental operation of vendors. Therefore, purchasers need to make a contribution analysis concerning how much they wish their vendors to improve.

### **2.3.2 Green Material Management and Manufacturing**

Green material management and production design for the environment includes all the operations put on a product during manufacture (Gupta and Sharma, 1996). This includes eco-design which refers to design for environment, green design which is design for green manufacturing, design for reduction, reuse design, recycling design, design for waste reduction and resource efficiency design. This will promote better efficiency, better productivity, cost saving, emission reduction, quality improvement and waste reduction (Hu et al. 2008). Life cycle analysis can be considered in this stage, it assesses the environmental, health and resource impacts a product generates during all the phases of its life. The phases include procurement of raw materials, production, transportation, usage, recycling and waste disposal. It spans over the

development, manufacturing and disposal stages of a product or service (Gungor et al, 1999).

### **2.3.3 Green Distribution and Marketing**

Green marketing and distribution refers to affirms strategy to designing, promote, price and distribute commodities that ecologically safe. Companies that choose to push for green marketing have various options that they may undertake such as choosing to pursue a green marketing agenda. Such concerns include: creating avenues that conserve energy and other natural resources in the marketing and distribution process (Porter, 1991); creation of promotional items and adverts that perfectly show a firms obligations to environmental conservation (Kangun et al., 1991); pricing green commodities should take into account the customers reaction on agreeing to paying a premium for a safe environment (Jay 1990); lowering or removing contaminants and conserving resources in the movement of goods to markets (Bohlen et al., 1993) among other marketing-related decisions.

One way of environmental management is to employ the “3R formula” i.e. reuse, recycle and reduce. By re packaging, recycling of materials and reduction of resource usage constitutes to a firm’s paramount role in environment protection (Kalama, 2007). This can aid positioning particular organizations as green oriented in the public’s eye.

### **2.3.4 Reverse Logistics**

According to De Brito (2003) “ancient logistics uses forward thinking”. This means to move products from the producer through the supply chain till they are disposed. This traditional role is being subjected to further re-evaluation from the drive towards greater environment management throughout organization and throughout supply

chain. Scholars have evaluated the forces driving environment management and have noted the major indicators to be compliance with regulation, legislation and cost saving (Green et al., 1995). Reverse logistics is therefore related to recycling of products and materials after their life process. It can be defined as, "the process of transporting goods for the reason of getting value or proper disposal". Thus a reverse logistics system should take into account the internal operations of a company through better integration of all the stakeholders within the supply chain and through after sales services.

Fleischmann et al. (1997) outlines, "examples of how some countries have enforced environmental laws, tasking manufacturers with responsibility for the whole product life process. Therefore, companies must consider reverse logistics as strategic weapon to help them gain a competitive edge by addressing the issues regarding the whole product/ service life cycle".Dowlatshahi (2005) emphasizes a number of strategic indicators for reverse Logistics, outlining the cost implication, quality, customer satisfaction, environmental drive and legal aspects. For example does the cost of reverse logistics increase significantly the overall cost of the products? What is the price of overlooking reverse logistics? Does an illegal action affect the company's reputation and financial Performance? Is the customer willing to purchase a recycled product ?

Just like other Green Operations, Reverse Logistics is highly affected by the product design. If many valuable components are included in the process of developing the final product, then reverse logistics becomes less cost sensitive. This means organizations can make reverse logistics a profit making activity through re-using, re-

cycling, or re-manufacturing the value of some ingredients found in discarded items at their end-of- use. This will help in reducing excess landfill costs and environmental burdens and fines.

## **2.4 Empirical Review**

In the recent past, literature on green operations has been expanding. For example, Rahimifard and Clegg (2007), in their editorial of the special issue on green manufacturing design concluded that there is an urgent and crucial need for further research in every phase of a product's lifetime. Moreover, Linton, Klassen, & Jayaraman, (2007) argued that operations management research need to enlarge its perspective to include "the planet" because companies will eventually be expected to do so. Szuchnicki (2009) did a study that examined the, "correlation between customer return intention and the institution of green practices within a restaurant setting". The findings showed that, "a restaurant that has gone green has higher customer retention, than those who choose to operate using traditional operational practices". Yusof and Jamaludin (2013) conducted a study on, "best practice of green island resorts". The objective of this study was to, "find out the best practice and the factors that influence the best practice of the resort operators". The study found out that, "green initiatives helped to cut down the running cost and each resorts adopted different best practice that suit their environment". Enz and Siguaw (1999) examined four hotels that agreed that, "cost savings, operating efficiencies and excellent marketing opportunities are derived from their environmental initiatives". The study points to managers that commitment to green management will result in a positive influence on financial performance.

Afande (2010) on green marketing strategy adoption by Kenyan tea firms with ISO 9000 and 14001 certifications, the conclusion was that Kenya is still in the process of

completely adopting green strategy. A study by Irungu and Mungai (2013) focused on, "the assessment of management commitment to application of green practices in 4 to 5 Star hotels in Mombasa, Kenya. The findings indicated that 90 percent of the managers were not satisfied with their current issues while 82 percent were focusing on improving the green concepts". In another study by Kirimi (2014), it was established that, "green marketing mix strategies influence the performance of fast moving consumer goods companies in Nairobi County". He pointed out that green marketing strategies are in place but adoption rate for most firms in Kenya is still very low, biased and not felt by most consumers.

Lastly there is a study done by Kamori, (2013) focusing on green marketing strategies adoption in supermarkets. His conclusion was that going green is not yet fully adopted and there exist a few challenges. For examples; the process entails setting aside a huge financial investment which consequently brings about low returns. Resistance to change in some departments slowing down the adoption of green initiatives. He recommended that government should put in strict legislative requirements as well as conservation policy to encourage industrial greening

From the above discussion it's clear that green operations in Kenya are still in their implementation stage and therefore more awareness among industries is crucial. Firms are expected to be at different stages in the adoption process of green operations as is the evidence with other countries of the world. Going green is increasingly a big concern for many businesses in the current global world. Businesses that wish to survive competition in the foreseeable future require long term vision of generational sustainability and environmental protection. It is a

challenge for many businesses in the rapidly growing world population where natural resources are being depleted at an alarming rate. Food processing industry particularly is associated with lots of negative environmental impact, from pollution, poor waste disposal, use of unclean energy and technology to environmental degradation. Of particular concern is how slow companies are embracing sustainability measures such as green operations. This study sought to determine the effect of adopting green operations on operational performance of food processing companies with specific focus on the firms located in Mombasa County.

### **2.5 Summary of Literature Review.**

Food and Beverage companies provide immense contribution in the Kenyan economy (Potter & Lalwani, 2008). In this regard, more research is needed to address the issues affecting their operations, the challenges facing the industry as well as shading light on the impact of the negative environmental activities associated with them. Recognition is given to the scarce literature available on green operations but more needs to be done both in the manufacturing and service sector.

Further empirical work to assess the link between environmental operations and firms- level of performance in the industry is paramount. Consequences of environmental burdens and degradation have caused serious environmental problems including global warming and acid rain. Conclusively green operations initiatives are desirable and crucial in every organization`s supply chain to shift the traditional paradigm of reactive regulatory to pro-active strategies and competitive advantages

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter discussed the research design, study population, data collection procedures and analysis the data.

### **3.2 Research Design**

The design used was a descriptive cross-sectional survey. This type of research design is concerned with determining and reporting the current status of the subjects in a study. Mugenda, (2003) emphasized that; “research design examines the relationship between variables of interest as they exist in a defined population at a single point in time and requires the collection of quantifiable information from a sample population”. Thus this design was appropriate as conclusions were based on the information provided at the time of study.

### **3.3 Study Population**

According to Mugenda and Mugenda, (2003) population is a, “complete set of objects with common observable traits”. The study population included all the food and beverage processing firms in Mombasa County. According to the business register of County Government of Mombasa as of September 2016, there were a total of 55 food and beverage processing firms. This study was a census.

### **3.4 Data Collection**

Primary data was obtained through questionnaires that were administered using ‘drop and pick later’ method as well as a few emails. The questionnaires sought data from production and operation managers of all the 55 firms. The questionnaires were keenly structured in a comprehensive manner so as to obtain the relevant information



through open and closed ended questions. Kothari (2007) terms the questionnaire as; “the most appropriate instrument due to its ability to collect a large amount of information in a reasonably quick span of time”. It is for the noted reason that the questionnaire was selected as a reasonable instrument for this research. The questionnaire was divided into four parts. The first part consisted of the company’s demographic information; the second part consisted of questions relating to green operations awareness. Part C comprised of questions on the adoption of green operations components while Part D consisted of questions on operational performance.

### **3.5 Data Analysis**

Data collected was checked for completeness, consistency and accuracy. Then it was coded for analysis. To analyse the data the researcher used descriptive statistics (percentages, frequency, average scores and standard deviations). This is because the data collected was descriptive in nature. The percentages and frequency was be used to examine the company’s bio information. Mean scores and standard deviations of the survey was used to determine the effect of implementing green operations among food processing firms in Mombasa County. Correlation model was used to test the degree of relationship between the variables in this study. Pearson Product-Moment correlation ( $r$ ) was used since the variables were measured in interval scales and are continuous. Regression analysis was performed to determine how the independent variables affect operational performance.

This was of the form;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 - \beta_3 X_3 - \beta_4 X_4$$

Where;

Y = Operational performance

$\beta_0$  = Constant

X1 = Green purchasing and supply

X2 = Green Production and Manufacturing

X3 = Green marketing and Distribution

X4 = Reverse logistics strategy

## **CHAPTER FOUR: DATA ANALYSIS AND FINDINGS**

### **4.1 Introduction**

In this chapter data analysis, findings and discussion was presented in line with the objective of the study.

### **4.2 Demographic Information**

The research set out to determine the effect of green operations and operational performance of food and beverage companies in Mombasa County, Kenya. The findings are presented as a report of the questionnaires answered by the various respondents. Out of the 55 companies targeted, a response of 37 was received which translates to response rate of 67%. According to Mugenda and Mugenda, (2003) this response rate is adequate since it exceeds 50% as recommended

Descriptive statistics was used to analyse the company's demographic information. Respondent's data comprised of level of education, length of continuous service with the firm, the length of a company's operations in Kenya and percentage of firm's ownership. The relevant responses were presented in the following sub-sections. The analysis of the above mentioned information is presented in tables.

**Table 4.1 Demographics**

<b>Demographic</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Level of Education</b>		
Undergraduate	20	54%
Tertiary College	14	38%
Secondary	3	8%
<b>Duration (years) of continuous service to the firm</b>		
Below five years	12	32%
5-10 years	10	27%
Over 10 years	15	41%
<b>Age of the firm (years)</b>		
1-5 Years	5	14%
6-10 Years	7	19%
11-15 Years	9	24%
16 and above years	16	43%
1-5 Years	5	14%
<b>Firm ownership</b>		
Locally Owned	29	78%
Small Foreign Shareholding	3	8%
Large Foreign Shareholding	5	14%
Total	37	100%

**Source: Research Data, 2016**

Based on the level of education, we are informed that majority of the respondents had a rich knowledge in their fields of work as shown by the findings above. Findings from the respondents' continuous service in the firm allow us to conclude that they are well conversant with the company's operations. The analysis of age shows the length of time the company has existed in Kenya is very important in testing the relationship between firm's existence and adoption of green operations initiatives. 43 % of the firms have existed over a decade while 57 % is distributed between 1 & 15 years of a firm's existence. We can therefore conclude that these firms have experienced environmental impacts resulting from their own operations and those of other partakers. Thus they can all agree from experience that environmental consciousness is very **key** for future sustainability.

The analysis on the firms' ownership structure shows that majority of the firms in food and beverage sector in Mombasa County are locally owned with small percentage of 9% small foreign shareholding while 14% had a larger foreign control. This data is crucial for testing the relationship between firm's ownership and green operations strategy adoption.

### **4.3 Awareness of Green Operations Initiatives**

For awareness of green operations initiatives, it was found out that 32(86%) were aware while the rest were not aware i.e. 14% implies that most food processing firms have heard about green operations strategies and are aware of "Greening the industries initiatives". Majority are either practicing or are considering practicing green operations. On whether green operations discussed in the firm's internal meetings 27 respondents 72% asserted so and 10 respondents didn't discuss green operations in their firms. It's clear that most food and beverage processing firms care

and are concerned about the environment by including discussions on green operations in their internal meetings.

The study also sought to find out whether employees were trained on green operations and it was revealed that 72% of the firms surveyed have trained their staff at least once in a year on green operations while 28 % of the firms in the same sector have not cared to train their staff on green operations. This implies that those firms that have not implemented green operations do not care to train their staff on the same and are less conscious on the environmental implications of their operations. of an environmental representative in the firm was also studied, and it was shown that 81% of the firms surveyed had an environmental representative. This implied that the majority of the firms were in full compliant with NEMA regulatory policy which deals with protection of the environment. This also implied that external pressures such as government legislation and regulations, customer demands and investors motive are playing a key role in forcing these firms to adopt green operations.

#### **4.4 Descriptive Statistics for Extent of Adoption of Green Operation Components**

Descriptive statistics for the study variables for the extent of adoption of green operation components were conducted and the same was analyzed as below.

##### **4.4.1 Green Purchasing and Supply**

The mean and the standard deviation for the green purchasing and supply were calculated and are shown in table 4.3 below

**Table 4.2 Descriptive Statistics for Green Purchasing and Supply**

	Mean	Std. Deviation	Ranking
NEMA implementation of environmental policies	4.03	.552	1
Importance of environment impact assessment	4.00	.527	2
Stakeholder partnership	3.76	.895	3
Redesigned business process and systems	3.00	1.179	4
Customer comfortable in paying a premium for the green product	2.76	1.038	5

**Source: Research Data, 2016**

From the table, most customers embraced NEMA implementation of environmental policies with a mean of 4.03, importance of environment impact assessment had a mean of 4.00, and stakeholder partnership followed with a mean of 3.76. Lastly customer comfortable in paying a premium for the green product had a mean of 2.76. On the standard deviation, the one with the highest deviation from the mean is redesigned business process and systems with a value of 1.179. For ease of identification the means were ranked.

#### **4.4.2 Green Production and Manufacturing**

The mean and the standard deviation for the green production and manufacturing were calculated and are shown in table 4.4 below

**Table 4.3 Descriptive Statistics for Green Production and Manufacturing**

	Mean	Std. Deviation	Rankin g
Standardization to ensure safety	4.76	.548	1
Recyclable packaging for the products	2.92	.722	2
Usage of organic raw materials in manufacture	2.89	1.022	3
Manufacturing locally	2.76	1.038	4
Product packaging bio degradable	2.38	1.089	5
Presence of recycled items in the firm	2.30	1.151	6
Embracing clean technology	1.49	.989	7

**Source: Research Data, 2016**

From the table, standardization to ensure safety had the highest mean of 4.76 followed by recyclable packaging for the products with a mean of 2.92; usage of organic raw materials in manufacture had a mean of 2.89 followed by manufacturing locally with a mean of 2.76. Product packaging bio-degradable had a mean of 2.38 and finally embracing clean technology had the least mean of 1.49. On the standard deviation, the highest standard deviation was with the presence of recycled items in the firm with a value of 1.151 and the least standard deviation value was standardization to ensure safety with a value of 0.548.

#### **4.4.3 Green Marketing and Distribution**

The mean and the standard deviation for the green marketing and distribution were calculated and are shown in table 4.4 below



**Table 4.4 Descriptive Statistics for Green Marketing and Distribution**

	Mean	Std. Deviation	Ranking
advertising materials biodegradable	4.57	.987	1
environment friendly products and waste disposal methods	4.41	1.013	2
redesigning for good storage	4.27	1.283	3
transportation fleet fuel efficient	3.70	.618	4
CSR related to environmental conservation	3.70	1.024	5
green marketing communication tools	2.95	.941	6
digital advertising to reduce paperwork	2.89	.875	7
reports on environmental protection expenditures	2.57	1.214	8
internal circulation of newsletters on environmental actions	1.49	1.234	9

**Source: Research Data, 2016**

From the table, advertising materials biodegradable had the highest mean of 4.57 followed by environment friendly products and waste disposal methods with a mean of 4.41, this was followed by a plethora of other factors. The one with the least mean is internal circulation of newsletters on environmental actions which had a value of 1.49. This implies it was least considered. The highest deviation from the mean was in the redesigning for good storage with a standard deviation of 1.283 and the least standard deviation being green marketing communication tools with a value of .941.

#### 4.4.4 Reverse Logistics Strategy

The mean and the standard deviation for the reverse logistics were calculated and are shown in table 4.5 below

**Table 4.5 Descriptive Statistics for Reverse Logistics Strategy**

	Mean	Standard Deviation	ranking
Planning and effective flow of raw materials	4.70	.571	1
Staff trainings and seminars on environmental protection	2.89	1.022	2
Firm accepts previously shipped products	2.84	.800	3
Employees aligned to corporate green vision	2.49	1.216	4
Employees are aware of the benefits of green	2.38	1.233	5
Reachable for consumer feedback on media	1.78	1.315	6

**Source: Research Data, 2016**

From the table, planning and effective flow of raw material had the highest mean of 4.70 followed by staff trainings and seminars on environment protection with a mean of 2.89. The one with the least mean is reachable for consumer feedback on media which had a value of 1.78. This implies it was least considered. The highest standard deviation was in the reachable for consumer feedback on media with a standard deviation of 1.315 and the least standard deviation being planning and effective flow of raw materials with a value of .571.

#### 4.5 Descriptive Statistics for Operational Performance

Descriptive statistics for the study variables for operational performance was conducted and the same was analyzed as below

#### 4.5.1 Cost

The mean and the standard deviation for the cost was calculated and is shown in table 4.6 below

**Table 4.6 Descriptive Statistics for Cost**

	Mean	Std. Deviation	Ranking
Water bills decreasing	3.73	1.071	1
Energy bills decreasing	3.19	.938	2
Raw materials damage and spoilage has been reducing.	1.95	.815	3
Scrap rate has been going down	1.95	.815	4
Cost of labour decreasing	1.95	.815	5

**Source: Research Data, 2016**

From the table, water bills decreasing had the highest mean of 3.73 followed energy bills decreasing with a mean of 3.19. The rest of the factors tied at a mean of 1.95. The highest standard deviation was water bills decreasing with a standard deviation of 1.071 and the least standard deviation being a tie of three factors at .815

#### 4.5.2 Flexibility

The mean and the standard deviation for the flexibility was calculated and is shown in table 4.7 below

**Table 4.7 Descriptive Statistics for Flexibility**

	Mean	Std. Deviation	Ranking
Increase in volume of goods and service	3.89	.658	1
Increase in variety of services	3.86	1.182	2
Increased response to client feedback and demands	3.00	.972	3
Increased interaction with clients	1.62	.758	4

**Source: Research Data, 2016**

From the table, increase in volume of goods and service had the highest mean of 3.89 followed increase in variety of services with a mean of 3.86. Increased response to client feedback and demands had a mean of 3.00 and lastly, increased interaction with clients had a mean of 1.62. The highest standard deviation was increase in variety of services with a value of 1.182 and the least value was 0.658 from Increase in volume of goods and service.

#### 4.5.3 Product and Service Quality

The mean and the standard deviation for the product and service quality were calculated and are shown in table 4.8 below

**Table 4.8 Descriptive Statistics for Product and Service Quality**

	Mean	Std. Deviation	Ranking
Increase in the strength of brand value	3.43	.959	1
Increase in sales revenue	3.38	1.063	2
Increase in the number of stakeholders	2.16	.958	3
High stakeholders loyalty	2.11	.699	4
High regulatory compliance	2.00	.782	5

**Source: Research Data, 2016**

From the table, increase in the strength of brand value had the highest mean of 3.43 followed by increase in sales revenue with a mean of 3.38. Increase in the number of stakeholders had a mean of 2.16 and the least was high regulatory compliance with a mean of 2.00. The highest standard deviation was increase in sales revenue with a value of 1.063 and the least value was 0.699 from high stakeholder's loyalty.

#### **4.5.4 Speed of delivery**

The mean and the standard deviation for the speed of delivery were calculated and are shown in table 4.9 below

**Table 4.9 Descriptive Statistics for Speed of delivery**

	Mean	Std. Deviation	Ranking
Increase in the speed of response to client needs and queries	3.65	.978	1
Increase in online buying and selling	3.38	1.516	2
Increase in online marketing	3.27	.932	3
Increase in speed of communication flow	3.24	1.234	4
Increase in the speed of transaction	3.22	1.417	5

**Source: Research Data, 2016**

From the table, increase in the speed of response to client needs and queries had the highest mean of 3.65 followed by increase in online buying and selling with a mean of 3.38. Increase in online marketing had a mean of 3.27 and the least was increase in the speed of transaction with a mean of 3.22. The highest standard deviation was Increase in online buying and selling with a value of 1.516 and the least value was 0.932 from increase in online marketing.

#### **4.6 Tests for Normality**

The sub-variables were transformed to form aggregate variables to enable analysis. To enable subsequent tests for the data, it was necessary to subject the data to normality tests. The ones employed in this study were normal P-P plot from the residuals of the study variables, Shapiro-Wilk and Kolmogorov-Smirnov tests and histogram of operational performance.

From the Normal P-P plot from the residuals in Appendix II shows that the data is normal since the values in the plot fall between 0 and 1. The histogram in Appendix II

also shows a Normal curve. Normality was also tested using Shapiro-Wilk and Kolmogrov-Smirnov tests.

The table 4.17 here below shows the Shapiro-Wilk and Kolmogrov-Smirnov tests which was conducted for the dependent and independent variables. Since the variables are  $37 < 2000$  the Shapiro Wilk test was used and the data was found to be normally distributed because the p-values for all the dependent variables (ratios) were less than 0.05 at 95% significance

**Table 4.10 Shapiro-Wilk and Kolmogrov-Smirnov test for the variables**

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statisti c	df	Sig.	Statisti c	df	Sig.
Green Purchasing and Supply Agg	.215	37	.000	.900	37	.003
Green Production and Manufacturing Agg	.365	37	.000	.705	37	.000
Green Marketing and Distribution Agg	.295	37	.000	.804	37	.000
Reverse Logistics Strategy Agg	.262	37	.000	.832	37	.000
Operational Performance	.210	37	.000	.829	37	.000
a. Lilliefors Significance Correction						

**Source: Research Data, 2016**

The study then concludes that, the data comes from a normal distribution. Thereafter the researcher went ahead with the Correlation Analysis.

#### **4.7 Correlation Analysis for the Study Variables**

Correlation analysis for the study variables was conducted and the same was tabulated in Table 4.18. The independent variables were correlated against the dependent variables. Correlation was found to be positive but weak for all the independent variables against the dependent variable. The correlation for green purchasing and supply and operational performance was found to be 0.189, this implies an increase in green purchasing and supply results in an increase in operational performance



		Green Purchasing and Supply Agg	Green Production and Manufacturing Agg	Green Marketing and Distribution Agg	Reverse Logistics Strategy	Operational Performance
Green Purchasing and Supply Agg	Pearson Correlation	1	.015	.350*	.030	.189
	Sig. (2-tailed)		.929	.034	.859	.264
Green Production and Manufacturing Agg	Pearson Correlation		1	.720**	.909**	.067
	Sig. (2-tailed)			.000	.000	.696
Green Marketing and Distribution Agg	Pearson Correlation			1	.702**	.066
	Sig. (2-tailed)				.000	.697
	Pearson Correlation				1	.009
Reverse Logistics Strategy	Sig. (2-tailed)					.960
Operational Performance	Pearson Correlation					1
	Sig. (2-tailed)					
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

**Source: Research Data, 2016**

The correlation between green production and manufacturing and operational performance is 0.067 while the correlation between green marketing and distribution and operational performance is 0.066. The correlation between reverse logistics and operational performance is 0.009.

#### 4.8 Regression Analysis for the Study variables

To determine the linearity of the study variables, regression analysis was done and is as shown in Table 4.12

**Table 4.12 Co-efficient of the regression model**

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	2.484	.417		5.953	.000
GreenPurchaseNsupplyAgg	.141	.124	.223	1.135	.265
GreenPrdctinNmanufacturingAgg	.222	.244	.396	.909	.370
GreenMarketingNdistributionAgg	-.047	.148	-.091	-.315	.755
Reverse Logistics StrategyAgg	-.157	.222	-.294	-.706	.485

The model was fit and the equation was as here below

$$Y = 2.484 + 0.141X_1 + 0.222X_2 - 0.047X_3 - 0.157X_4$$

At 5% level of significance it was found that green purchasing and supplies and also green production and manufacturing varied positively with operational performance. It was also found out that green marketing and distribution and also reverse logistics strategy varied negatively with operational performance. When green purchasing and supplies increases with one unit operational performance increases by 0.141, when green production and manufacturing increases by one unit operational performance increases by 0.222. When green marketing and distribution increases by one unit the operational performance reduces by 0.47 units and when reverse logistics strategy increases by one unit operational performance decreases by 0.157.

#### 4.9 Overall Summary of Green Operations Practices

The researcher summarized the green performance practices and ranked them as shown in table 4.13 below

**Table 4.13 Overall summary of green operations practices**

	Mean	Std. Deviation	Ranking
Green production and manufacturing	3.2117	.59271	1
Reverse Logistics and strategy	3.1532	.62284	2
Green Marketing and Distribution	2.5946	.64268	3
Green purchase and supply	2.2973	.52651	4

Green production and manufacturing had the highest mean of 3.2117 implying it is the practice that was most preferred by the firms. Followed by reverse logistics and

strategy with a mean of 3.1532, the third most preferred practice was green marketing and distribution with a mean of 2.5946 and lastly the least preferred practice was green purchase and supply with a mean of 2.2973. The study found out that green production and manufacturing was the greenest practice preferred.

#### **4.10 Discussion of Findings**

The study sought to establish the effect of green operations on operational performance of food and beverage processing firms in Mombasa County, Kenya. Out of the 55 companies targeted, a response of 37 was received which translates to response rate of 67%. According to Mugenda and Mugenda, (2003) this response rate was adequate since it exceeds 50% as recommended. 86% of the respondents asserted that they were aware of green operations. This was good for the study as unawareness would render the study undoable. These operations were discussed in internal meetings (71%), the employees were trained in green operations (71%) and there was presence of an environmental representative (80%).

Descriptive statistics for the study variables was conducted. Under green purchasing and supply the NEMA implementation of environmental policies had the highest mean of 4.03, followed by the importance of environment impact assessment with a mean of 4.00. This implies that they were the most preferred green operation components. Their standard deviations were 0.552 and 0.527 respectively implying that their level of deviation from the mean is minimal. On Green Production and Manufacturing, standardization to ensure safety had the highest mean of 4.76. As a green operation component it was the most preferred. It also had the least standard deviation implying its deviation from the mean is minimal (least variation in responses). Under green marketing and distribution, advertising materials

biodegradable had the highest mean of 4.57 followed by environment friendly products and waste disposal methods with a mean of 4.41. These were the two most preferred components. On Reverse Logistics Strategy, the two most preferred components were planning and effective flow of raw materials had the highest mean of 4.70 followed staff trainings and seminars on environment protection with a mean of 3.89. The overall summary for the independent variables was done and it was found out that green production and manufacturing was the preferred practice.

Operational performance components were analyzed and on cost, bills decreased. On flexibility there was increase in volume of goods and service variety. On product and service quality there was increase in the strength of brand value and sales revenue. Finally on speed of delivery there was increase in speed of response to clients' needs and queries and increase in online trade.

Most statistical tests, usually assume normality of data. This study's data analysis didn't assume so. The data was subjected to normality tests, and it was found to be normal. This warranted the usage of parametric tests. Correlation analysis was conducted, According to the Pearson Correlation matrix, there was found to be positive but weak relationship between the dependent and independent variables of the study. Implying increase in the independent variables will result to an increase in the dependent variables. From regression analysis at 5% level of significance it was found that green purchasing and supplies and also green production and manufacturing varied positively with operational performance. It was also found out that green marketing and distribution and also reverse logistics strategy varied negatively with operational performance. The study found out that green operation had an effect on operational performance for food and beverage processing firms in Mombasa County, Kenya.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter captures the summary of the findings, limitation, conclusion, recommendations and suggestions for further study. It is entirely derived from the findings and results of this study in chapter four.

### **5.2 Summary of Findings**

To establish the effect of green operations on operational performance of food processing firms in Mombasa County, Kenya. The study got a response of 37 companies from a census of 55. The research design was a descriptive cross-sectional survey and relied on primary data from food processing firms in Mombasa County. Data was analysed on the basis of descriptive statistics. The objective of the study was to be met using the primary data and employing correlation analysis. Data was tested for normality and it was found to be normal thereby warranting usage of parametric tests such as correlation and regression model of analysis.

The independent variables were correlated against the dependent variables. Correlation was found to be positive for all the independent variables against the dependent variable. The correlation for green purchasing and supply and operational performance was found to be 0.189, this implies an increase in green purchasing and supply results in an increase in operational performance. The correlation between green production and manufacturing and operational performance is 0.067 while the correlation between green marketing and distribution and operational performance is

0.066. The correlation between reverse logistics and operational performance is 0.009. This means that the green operations had an effect on the operational performance of food processing firms in Mombasa County.

### **5.3 Conclusion**

The study can attest to the fact green operations had an effect on the operational performance of food processing firms in Mombasa County. This was shown at 5% confidence level. The study also concluded that the independent and dependent variables had a meaningful and positive effect. This was exhibited in all the study variables. This is in agreement with the assertion of Taylor (1992) that, businesses that embrace green operations are likely to see positive change in their operational performance. Further, Enz and Siguaw (1999) in his study agreed that cost savings, operative efficiencies and excellent marketing opportunities are derived from their environmental initiatives; the research postulates that commitment to green management would positively influence performance.

From the findings it was noted that majority of the food processing firms were in the planning and implementation stage while others are still weighing in the options of going green. This is in line with a study by Afande (2010) on green marketing strategy adoption by Kenyan tea firms, where he concluded that Kenya is still in process of adopting green strategy. The findings revealed that most firms preferred buying from environmentally compliant suppliers but little effort was given to developing and maintaining a database of compliant suppliers.

Also less importance was given to use of alternative fuels such as biogas, solar and power. It was noted that companies were keen to green their internal practices e.g. recycling water for reuse, use of online advisement, reduced use of paperwork among

others rather than greening in the external stakeholders. Conclusively more awareness of the green operations is needed not only in the food and beverage sector but also in the entire fabric of manufacturing and service sector of the Kenyan economy. This is a confirmation of a study by Kamori (2013) going green is not fully adopted and there exists some challenges. He further asserted that resistance to change was slowing down adoption of green initiatives. Kirimi (2014) in a study on green marketing mix strategies, he pointed out that green marketing strategies are in place but adoption for most Kenyan firms in Kenya is still very low.

#### **5.4 Limitations of the Study**

Care must be taken to generalize the results of this study as there were some limitations. The study was limited to the food processing firms in Mombasa County only. Although the findings can be used to cut across the food processing industry. Data collection was limited to most companies not willing to disclose their information citing to insecurity from competitors and the fact that they may not benefit from the research findings. Time as well was a limiting factor as the researcher felt that the distribution of the questionnaires required more time may be even one on one interview to ascertain some responses.

#### **5.5 Study Recommendation**

The study recommends creating more awareness of green operations not only among industries but also the entire societal fabric to ensure a two way interaction between producers and consumers of green products and services. Government should not only tighten environmental protection measures but also increase legislation and regulations and enforce them among industries accordingly. Government and other



stakeholders should champion the use of alternative fuels such as biogas, solar and wind power.

### **5.6 Suggestions for Further Research**

The study recommends that research should be done to other industries in the country. The findings of the studies can be compared with the findings from this study. The research also recommends studies to be done across the region and compare the findings. It would be interesting to find out how the results of the same study would be in other economies.

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# APPENDICES

## Appendix I: Introduction Letter



**UNIVERSITY OF NAIROBI  
MOMBASA CAMPUS**

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Telephone: 020-2059161  
Telegrams: "Varsity", Nairobi  
Telex: 22095 Varsities  
Our Ref: D61/65365/2013

P.O. Box 99560, 80107  
Mombasa, Kenya

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DATE: 7<sup>TH</sup> OCTOBER 2016

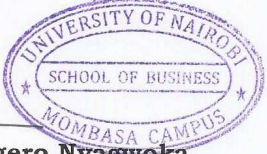

**TO WHOM IT MAY CONCERN**

The bearer of this letter, **Faith Mutheke** of Registration Number **D61/65365/2013** is a Master of Business Administration (MBA) student of the University of Nairobi, Mombasa Campus.

She is required to submit as part of her coursework assessment a research project report. We would like the student to do her project on ***Effect of Green Operations and Operational Performance of Food processing Firms in Mombasa, Kenya.*** We would, therefore, appreciate if you assist her by allowing her to collect data within your organization for the research.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organization on request.

Thank you.



**Zephaniah Ogero Nyagwoka**  
Administrative Assistant, School of Business-Mombasa Campus

## Appendix II: Questionnaire

### Instructions:

For certain questions, you may be required to select your answer by ticking () among the Choices given.

### PART A: DEMOGRAPHIC INFORMATION

1. Name of the firm (Optional).....
2. Position in the firm.....
3. What is your highest level of education qualification completed?
4. Post graduate level ()
  - a) Undergraduate ()
  - b) Tertiary College ()
  - c) Secondary ()
5. Length of continuous service with the firm?
  - a) Below five years ()
  - b) 5-10 years ()
  - c) Over 10 years ()
6. using the categories below kindly indicate how long your firm has been in Operation.
  - a) 1-5 Years ()
  - b) 6-10 Years ()
  - c) 11-15 Years ()
  - d) 16 and above years ()
7. Kindly indicate the ownership of the company using the categories below.

Ownership	Percentage share (%)
Locally Owned	
Small Foreign Shareholding	
Large Foreign Shareholding	
8. Is the firm ISO 14001 Certified Yes () No ()

**PART B: AWARENESS OF GREEN OPERATIONS STRATEGY**

1. Have you heard about green operations strategies? Yes ( ) No ( )
  - a) If yes, when did you hear about it?  
.....
2. Is green operations discussed in your internal meetings? Yes ( ) No ( )
3. Have you ever been trained on green operations strategies? Yes ( ) No ( )
- 4 .Do you have an environmental protection policy in your firm? Yes ( ) No ( )

If yes which year was the policy formulated? .....

5. Are you aware of “greening of industries initiatives”? Yes ( ) No ( )

If yes when did you hear about it.....

6. Do you have an environmental representative in your firm? Yes ( ) No ( )

**PART C: EXTENT OF ADOPTION OF GREEN OPERATION COMPONENTS**

The tables below represent the various aspects regarding the extent of adoption of Green purchasing and supply practises. Kindly indicate your rating on the statement applying the following key: 1 = Very large extent, 2 = Large extent, 3 = Moderate extent, 4= Small extent, 5 = Very small extent

<b>Green Purchasing and Supply</b>	1	2	3	4	5
Redesigned business processes and systems to be more efficient to support green Purchasing and supply practices?					
To what extent has the firm implemented environmental policies as per NEMA regulations?					
How important is environmental impact assessment to your firm?					
To what extent has your firm formed partnership with various stakeholders like distributors, the public, the government etc. with a view to protect the environment?					
Are your customers comfortable paying a premium for your green product?					
<b>Green production and manufacturing</b>					
To what extent do you use organic raw materials to manufacture your products?					
Have your products been standardized to ensure safety as per the law?					
Do you provide recyclable packaging for your products?					
Is your product packaging biodegradable?					
To what extent do you source raw materials for product manufacture locally?					
Do you have recycled items that you use in your firm i.e. paper, water, pens ,furniture ,signage etc.					
To what extent have you embraced use of clean technology e.g. use of solar power, wind power, etc.					
<b>Green marketing and distribution</b>					
Do you use digital advertising to reduce paperwork?					
In your marketing communications, does the firm clearly state					

environmental effort, characteristics and benefits achieved?					
To what extent is your transportation fleet fuel efficient?					
To what extent have you redesigned your physical facilities to favour good storage?					
Service for your company vehicles is done at the right frequency					
You have formulated a policy on replacement of your vehicles					
Do you use green marketing communication tools and practices to reinforce and educate on environmental protection?					
Does the firm understand the key to successful green marketing is credibility, and such, the factory never overstates environmental claims					
Does the firm provide customers with information on environmental friendly products and/or production, waste disposal methods in use?					
Does the firm publish reports on the expenditures that it incurs on environmental protection initiatives?					
Does the firm circulate newsletters internally to communicate environmental actions it is undertaking and individual contribution to all employees?					
Are your advertising materials biodegradable? (Pull up stands, Bill boards, posters, pamphlets etc.)					
Do you conduct CSR activities related to environmental conservation at least yearly?					
<b>Reverse Logistics Strategy</b>					
To what extent are trainings and seminars held internally for your staff and stakeholders on environmental protection initiatives					
The firm has formally implemented planning and effective flow of raw materials					
The firm accepts previously shipped products or parts for the purpose of disposal					
Are your employees aligned to your corporate green vision strategies and are they eager to implement?					
Are your employees aware of the benefits that are achieved when the firm is green in its practices?					
Are your employees aware of the risks involved when the firm is not green in its practices?					
Are you reachable to your consumers for feedback either through social media, telephone, email etc?					

## D: OPERATIONAL PERFORMANCE

Please indicate the extent to which the following operational outcomes have been enhanced as a result of implementing green operations. 1= Not at all; 2 = Small extent; 3 = Moderate extent; 4 = Great extent; 5 = Very great extent

<b>Cost</b>	1	2	3	4	5
Energy bills has been decreasing					
Water bills water bills have been decreasing					
Cost of labour has been decreasing					
Scrap rate has been going down					
Raw materials damage and spoilage has been reducing.					
<b>Flexibility</b>					
Increase in variety of services					
Increase in volume goods and services					
Increased interaction with clients					
Increased response to client feedback and demands					
<b>Product and Service Quality</b>					
Increase in the strength of brand value					
Increase in sales revenue					
Increase in the number of stakeholders					
High stakeholders loyalty					
High regulatory compliance					
<b>Speed of delivery</b>					
Increase in online buying and selling					
Increase in online marketing					
Increase in speed of communication flow					
Increase in the speed of transaction					
Increase in the speed of response to client needs and queries					

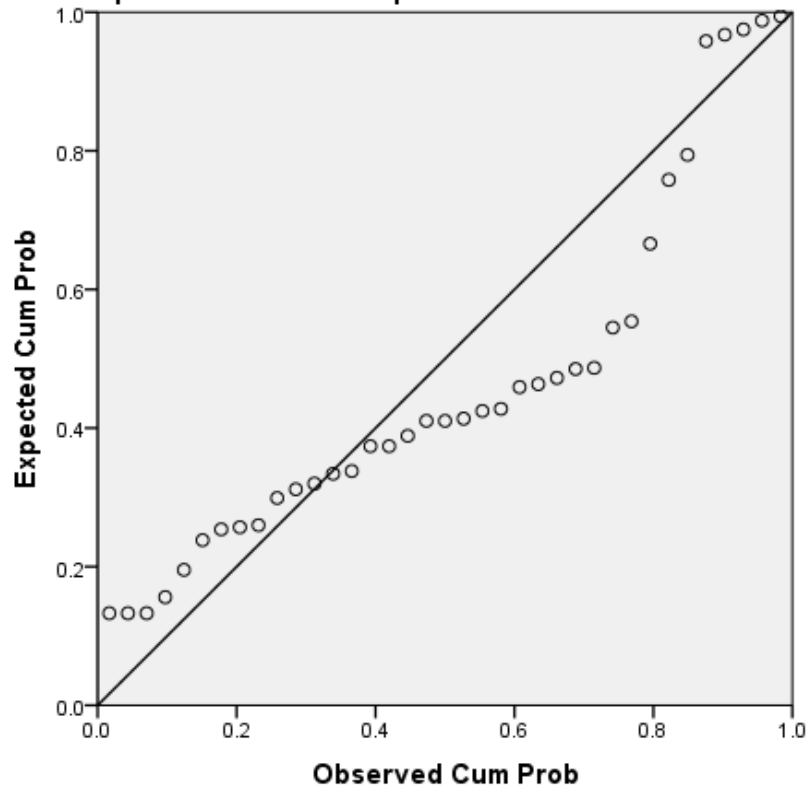
**Thank You Very Much**

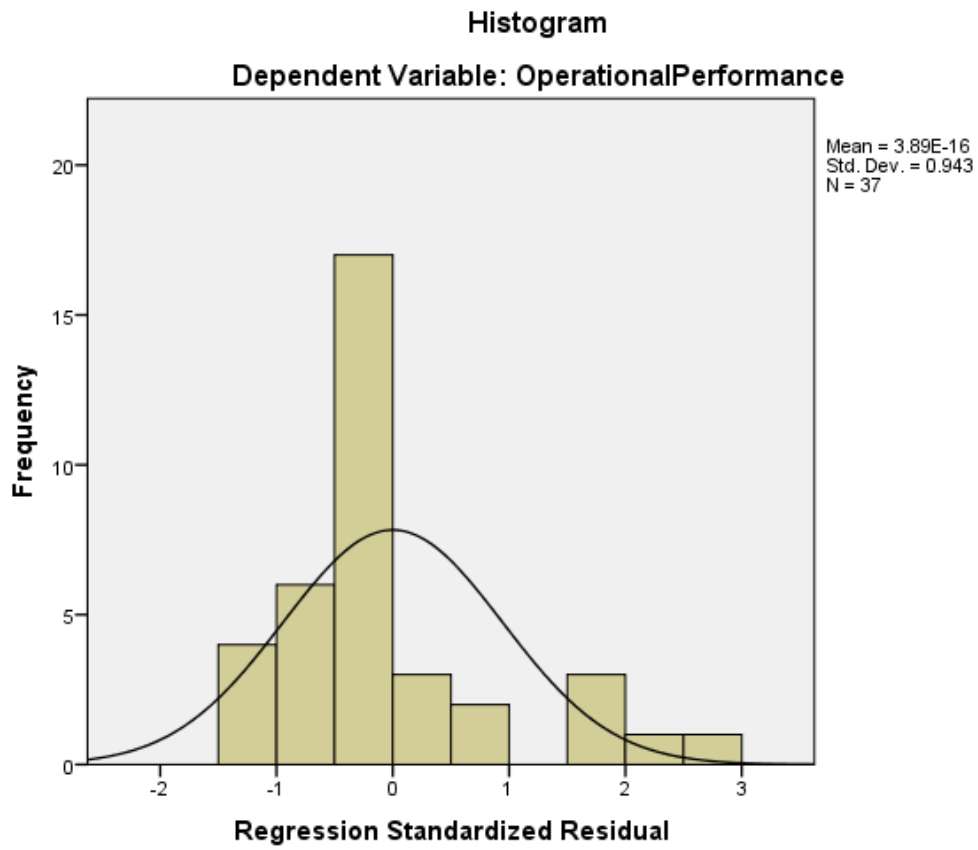


Appendix III: P-P Plot and Histogram

**Normal P-P Plot of Regression Standardized Residual**

**Dependent Variable: OperationalPerformance**





#### Appendix IV: List of Food Processing Firms in Mombasa County

SN	FOOD AND BEVERAGE PROCESSING COMPANIES IN MOMBASA COUNTY, KENYA.
1	African Tea & Coffee Co. Ltd TEA
2	Allfruits Ltd - EPZ
3	Alysco Foods
4	Atta Kenya Ltd – Mombasa
5	Aywaa Foods Ltd – Mombasa
6	Bake `N` Bite Ltd {Mombasa}
7	Budget Stores Ltd {Mombasa }
8	Cereals East Africa
9	Chai Trading Co. Ltd
10	Coastal bottlers Ltd
11	Deepan Manufactures {Mombasa}
12	Delmonte (K) Ltd {MSC Plaza, Mombasa}
13	Diamond Industries Ltd { Mombasa }
14	Discover Kenya Tea Ltd
15	Dutch Water Ltd {Mtwapa}
16	Eastern Produce Kenya Ltd {Mbaraki, Mombasa}
17	Emerald Foods {Mombasa}
18	Fayaz Bakers Ltd {Mombasa}
19	Global Tea (K) Ltd {Mombasa}
20	Gold Crown Beverages (K) Ltd {Mombasa}
21	Island Trading Company {Mombasa}
22	Janish Tea Ltd {Mombasa}
23	Kaveri Films { Mombasa }
24	Kensalt Ltd {Mombasa}
25	Kenya Bixa Ltd { Likoni Mombasa }
26	Kenya Coffee & Tea Specialists
27	Kenya Cold Storage (Foods) Ltd {Lumumba Road}
28	Kitui Flour Mills Ltd {Mombasa}
29	Krystalinne Salt (Mombasa) Ltd {Changamwe}
30	Lab International (K) Ltd {Mombasa}
31	Libra Food Products Ltd {Mombasa}
32	Magic Juice Ltd {Mombasa}
33	Masasada International Ltd {Mombasa}
34	Millennium Tomato Sauce Ltd {Mombasa}
35	Milly Fruit processors Ltd {Mombasa}
36	Mombasa Grain Milling Co. Ltd
37	Mombasa maize Millers Ltd
38	Mwanainchi Baker`s and Confectioners {Mombasa}

39	Mzuri Sweets Ltd {Mombasa}
40	Naivas Ltd {Mombasa}
41	Nakumatt Ltd Likoni {Mombasa}
42	Navida Natural Foods Ltd {Mombasa}
43	Pride Industries Ltd {Mombasa}
44	Pwani Oil Products Ltd {Railways, Mombasa}
45	Raha Foods Products Ltd { Mombasa}
46	Sasini Ltd { Mombasa}
47	Shifa Baker`s & Confectioners Ltd
48	Smart Tea Kenya Enterprises { Shimanzi}
49	Sweet R US Ltd {Mombasa}
50	T.S.S Grain Millers Ltd {Mombasa}
51	Tusker Mattresses Supermarket {Bandari}
52	Unimaize Ltd {Mombasa}
53	Wanainchi Marine Products {Ganjoni, Mombasa}
54	West Coast Oil East Africa Ltd {Mombasa}
55	Zeit Ice {Mombasa}

**According to Source: County Government of Mombasa, Business Register.**

**APPENDIX V: Research Budget**

<b>S/No</b>	<b>ITEM</b>	<b>AMOUNT(KSHS)</b>
<b>1</b>	<b>Transport costs</b>	<b>15,000.00</b>
<b>2</b>	<b>Photocopying, scanning and Internet services</b>	<b>9,000.00</b>
<b>3</b>	<b>Printing and Editing services</b>	<b>10,000.00</b>
<b>4</b>	<b>Binding</b>	<b>5,000.00</b>
<b>5</b>	<b>Purchase of data analysis software (SPSS)</b>	<b>15,000.00</b>
	<b>TOTAL</b>	<b>54,000.00</b>

### APPENDIX VI: Study Time Schedule

<b>ACTIVITY</b>	<b>DURATION</b>	<b>PERIOD (MONTHS)</b>
<b>Preparation for study</b>	<b>Jan 2016 – March 2016</b>	<b>3 Months</b>
<b>Drafting of research proposal</b>	<b>April 2016 – May 2016</b>	<b>1 Month</b>
<b>Proposal writing</b>	<b>June 2016 – August 2016</b>	<b>2 Months</b>
<b>Presentation and corrections</b>	<b>September 2016</b>	<b>1 Month</b>
<b>Data Collection and Analysis</b>	<b>October 2016</b>	<b>1 Month</b>
<b>Draft of final Study and corrections</b>	<b>October 2016</b>	<b>1 Month</b>
<b>Final report writing and presentation</b>	<b>October 2016</b>	<b>1 Month</b>