

# **GREEN ECONOMY STRATEGIES ADOPTION ON FINANCIAL PERFORMANCE OF BAMBURI CEMENT COMPANY, KENYA**

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## **ABSTRACT**

Successful green practices helps firms to achieve greater efficiency, establish and strengthen their core competencies, enhance their green image, all of these may eventually combine to contribute to firm profitability. Environmental sustainability in any given production is very important and this study sought to ascertain the effects of green economy strategies adoption on financial performance of Bamburi Cement Manufacturing Company, Kenya. The specific objectives were; to find out whether land rehabilitation affects financial performance of Bamburi Cement Manufacturing Company in Kenya, to determine the effect of waste management on financial performance of Bamburi Cement company, to establish the influence of emission reduction on financial performance of Bamburi Cement Company, and to find out the effects of alternative fuel measures on financial performance of Bamburi Cement Company. The study has five chapters whereby the first chapter establishes the background of the study, statement of the problem, research objectives, research questions, the significance of the study, along with its scope. The second chapter on its part offers a comprehensive review of the existing literature, pertaining to the main research topic. The theories given prominence in the study include the green economic theory and resource based view. Consequently, the research gap between the present studies and prior studies is established in depth. This chapter ends with a conceptual framework,

which provides a clear outline of both the independent and the dependent variables. Chapter three provides a critical analysis of the proposed methodology, in which the descriptive research design is chosen as the most suitable research design. The study used stratified sampling method as the main sampling technique in which the population of Bamburi Cement Manufacturing Company was divided into small groups (segments). Subsequently, the study used both primary and secondary data whereby primary data was collected using a structured questionnaire that was administered to the respondents while secondary data regarding Return on Equity (ROE), Return on Assets, and Net Income was obtained from published financial reports of the company. Chapter four entails the research findings and chapter five gives the summary of the study, conclusion and recommendation. The study found out that Bamburi Cement Manufacturing Company, Kenya had moderately adopted green economy strategies. It was concluded that the management of the company had partially implemented the adoption of green economy strategies and therefore the study recommended to them to put in place measures to ensure full implementation of the same. Data was analyzed through the use of Statistical Package for Social Scientists (SPSS) and presented by graphs, pie charts, and frequency tables.

**Key Words:** *green economy strategies, financial performance, Bamburi Cement Company, Kenya*

## **INTRODUCTION**

Commitment to the natural environment has become a strategic issue within the current competitive scenarios and some authors suggest that environmental management may be a tool which helps organizations to improve their competitiveness (Jose et al, 2009). Studies have found that firms invest in green practices because going green helps businesses develop new market opportunities and increase their competitive advantage (Wong, 2012).

Environmental perspectives on operations lead to different terminologies with varying scope. “Green Economy” is a term that emerges from the literature and it relates to all aspects related to product manufacturing, usage, handling, logistics and waste management. Today, environmental protection and economic burden on industry is leading organizations toward re-evaluation of their corporate strategies including operations and business performance. This is reflected in literature by the growing number of recent papers that explore the relationship between environmental operations and business performance (Ngniatedema & Li, 2014).

Stakeholder and institutional theories share a conceptualization of organizations being embedded within a wider social system that shapes their behavior. An organizations relationship with institutions and stakeholders are assumed to play a significant role in both definition and determination of success. Effective management of relationships with key stakeholders can contribute to enhanced financial performance through the creation, development or maintenance of ties that provide important resources to companies (Jose, Azorin, Cortes, Gamero & Tari, 2009). Interest in the resource-based view of the firm continues to grow in the field of business policy and strategy. Most of this interest seems to have been focused on understanding the empirical implications of this theory and especially on how a firm’s resources and capabilities can affect its performance (Barney, 1996). Green operations by cement manufacturing companies in Kenya are not just another corporate social responsibility (CSR) activity: it is about going beyond to conserve the environment and make the world a better livable place.

### **Green Economy**

Green Economy can be defined as using resources and capabilities of an organization to produce a product or service in most efficient and effective manner by integrating sustainability into operations. Sustainable business practice is about maximizing business potential without degrading the environment and working harmoniously with society (Sloan, Legrand, Tooman & Fendt, 2009). Environmental management evolved from pollution control and risk management in the 1970’s to pollution prevention in the 1980’s to the subsequent implementation of systematic product and process management. Further evolution has led to its recognition as a key area for companies wanting to be competitive in the modern global economy (Nunes & Benet, 2010).

Since its beginning, green operations have adopted mainly a process based approach. Environmental operations management (EOM) is the integration of environmental management

principles with the decision making process for converting resources into usable products. EOM is positioned at the strategic level of operations management since its primary concern is product and process design. The operations function of a company encounters environmental protection issues directly because it is the main source of harmful emissions, and thus environmental management programmes and policies should be carefully developed to strengthen its operations strategy (Nunes & Benet, 2010)

Green economy adoption should be an integral part of business but integration will be favored when decision makers in the firms realize that the implementation of proactive environmental strategies and pollution prevention initiatives may help firms to reach a situation in which both the company's financial performance and the environment will benefit. Some authors suggest that environmental management may be a tool, which helps organizations to improve their competitiveness (Jose et al, 2009). Business organizations should adopt green operations so that they can set a positive example by employees that help boost morale and company loyalty and Gaining competitive advantage by differentiating the business from its competitors, improving efficiency and lowering operating costs and providing a cleaner and healthier work environment (Bose & Luo, 2012)

Going green is not a term that managers can avoid any longer. For years environmental responsibility has been increasing in importance not only with managers but also consumers who grow more aware as well as other stakeholders affected by unsustainable business (Nunes & Benet, 2010). Businesses are progressing towards environmental sustainable solutions for their operations. Government and Non Governmental organizations attend to this topic of resources through legislations and restrictions regarding carbon credits and waste emission (Menzel, Smagin & David, 2010).

### **Financial Performance**

Traditionally, financial performance of cement manufacturing companies firms and other firms has been measured using a combination of conventional accounting measures and risk and return measures. Further analysis of financial performance has used methodologies such as financial ratio analysis, benchmarking, measuring performance against budget or a combination of these (Duncan & Elliot, 2004). Profit is the ultimate goal of firms hence all the strategies designed and activities performed thereof are meant to realize this grand objective. To measure the profitability of firms, there are varieties of ratios used of which return on asset (ROA), return on equity (ROE) and net interest margin are the major ones. The accounting based financial measures are direct indicators of a firm's financial condition from different perspective. ROA and ROE are usually used to examine a firm's asset and capital utilization, while profit margin, cost of goods sold and economic value added are common measures of a firm's capability to make profits. A few studies therefore propose financial measures based on cash flow to directly evaluate a firms profit and liquidity (Shi & Yu, 2013).

Users of financial statements evaluate the financial statements of companies to determine liquidity, leverage, asset activity, profitability, and performance. Users of financial statements use traditional balance sheet and income statement ratios for performance evaluation (Jooste, 2006). Operating activities are defined as the principal revenue-producing activities of a company. Therefore, along with traditional ratios operating cash flow is also important when evaluating a company's performance. Relative performance evaluation proceeds from the assumption that with the comparison of a company's performance to a norm, general uncertainties are eliminated and only specific performances with regard to the company remain. The performance of other companies or the industry then provides information regarding a specific company's performance (Jooste, 2006).

### **Green Economy and Financial Performance**

Managers are confronted with environmental issues in their decisions, not only to take into account ethics and social values that should be promoted by companies, but also to ensure sustainable economic success. In fact commitment to the natural environment has become strategic issue within the current competitive scenarios. Some authors suggest that environmental management may be a tool which helps organizations to improve their competitiveness (Jose, Azorin, Cortes, Gamero, & Tari, 2009).

Wong (2012) using assert that stringent environmental regulations can spur efficiency and induce innovations that help the economic performance of a firm. Studies have found that firms invest in green practices because going green helps businesses develop new market opportunities and increase their competitive advantage. Successful green practices helps firms to achieve greater efficiency, establish and strengthen their core competencies enhance their green image, all of these may eventually combine to contribute to firm profitability (Wong, 2012). The influence exerted by environmental management on firm performance, may result from the positive impact on firm costs and differentiation levels. Preventing pollution may enable the firm to save costs, input, and energy consumption, and to reuse materials through recycling. Jose et al. (2009) observed that eco-efficiency involves producing and delivering goods while simultaneously reducing the ecological pact and use of resources.

A review of the literature on environment issues indicates that a significant correlation exists between green practices and corporate profitability within any organization (Wong, 2012). Companies having higher scores on environmental criteria realize stronger financial returns than the overall market, whereas companies with poor scores have weaker returns (Ngniatedema & Li, 2014). Empirical studies have analyzed the relationship between environmental operations and practices and financial performance at the firm level are fragmented across industries.

Widely cited research results relate environmental operations and practices to a firm's stock market performance, market valuation and competitive advantage. Most of these studies suggest that environmental performance is positively correlated with the intangible asset value of a firm

(Menzel, Smagin, & David, 2010). From a competitive perspective, environmental operations can improve firm level financial performance and overall competitiveness through green products or services (Ngniatedema & Li, 2014).

### **Green Economy in Developed Nations**

The fastest growing countries such as Qatar, UK, United Arab Emirates, Cambodia, China, Thailand, Vietnam and many countries in the developed nations are adopting Green Economy Strategy in their production with the aim of conserving the environment (Brown, Eakman, Nahas, & Clavenna, 2001).

Most developing countries, and certainly the majority of their populations, depend directly on natural resources. The livelihoods of many of the world's rural poor are also intricately linked with exploiting fragile environments and ecosystems (Barbier 2005). Well over 600 million of the rural poor currently live on lands prone to degradation and water stress, and in upland areas, forest systems, and dry lands that are vulnerable to climatic and ecological disruptions.

### **Green Economy in Kenya**

The Green Economy Strategy adoption was initiated through a participatory and consultative procedure that began in 2013 including the national government key services, the 47 County governments, improvement accomplices, private area and common society associations. The interviews gave a gathering to key partners to give inputs towards the advancement of the Green Economy Strategy. The working session suggested five building squares for Kenya's Green Economy Strategy and Implementation Plan (GESIP) in particular in advancing sustainable framework improvement, building versatility, and sustainable natural resource management, promoting resource efficiency and social inclusion and sustainable development. Key areas were likewise distinguished including vitality, transport, water supply and sanitation, general well-being, waste management, Information and Communication Technologies (ICT), Agriculture, livestock, forestry and fisheries, land and ecosystem management, extractives such as oil, gas and mining, instruction, exchange, assembling and industry, building and development, tourism, building and development (Habert, et al 2010).

Sustainable economic growth is also threatened by Kenya's vulnerability to climate change. It is estimated that 42% of Kenya's GDP and 70% of overall employment is derived from natural resource related sectors, including agriculture, mining, forestry, fishing, tourism, water supply and energy. This proposal will assert the impacts of Green Economy strategy adoption on financial performance of Bamburi Cement Manufacturing Company in Kenya.

### **Cement Manufacturing Companies in Kenya**

There are five cement producers in Kenya: Bamburi Cement, Athi River Mining (ARM), East African Portland Cement Company (EAPC) Mombasa cement Company, backed by Taiheiyo

Cement Corporation the largest cement producer in Japan and the most recent National cement company. After a period of anemic growth, Kenya's manufacturing sector picked up in 2004/05, with output rising 4.1%. This was in response to rising demand and due to government incentives in the sector. Expansion included the cement sector. Lafarge has a 72% controlling interest in Bamburi Cement and a 41% shareholding in EAPC. Bamburi and EAPC have a combined output of approximately 1.8 million tones, representing over 80% of the domestic market (Fair, 2003). The companies are contributing a lot to Green House Gas emission and are emitting a lot of carbon to the environment, and therefore there is great need for them to adopt the green economy strategy for them avert the existing sustainability menace facing them.

### **Bamburi Cement Manufacturing Company and Green Economy**

Bamburi Cement Ltd. was founded in 1951 by a director of the Zurich-based company Cementia Holding A.G. and its first plant in Mombasa started production in 1954, with an annual capacity of 140,000 tons of cement. Cementia later went into partnership with Blue Circle, before being acquired by Lafarge in 1989, giving Lafarge and Blue Circle equal shareholdings in Bamburi (Bamburi Cement Company, 2014). Lafarge became majority shareholder of Bamburi in 2001, when it acquired Blue Circle. Today, the Group holds a 60% stake in the company, which is listed on the Nairobi stock exchange. Bamburi's Mombasa plant today has an annual capacity of 1 million tons. Bamburi also runs a 1 million ton clinker grinding plant just outside Nairobi, giving the company a total production capacity in Kenya of 2 million tonnes. Bamburi Cement is the largest cement manufacturing company in the region and its Mombasa plant is the second largest cement plant in sub-Saharan Africa. Bamburi's Kenyan operations supply the Kenyan market, but also other African markets, such as Rwanda, Sudan and Uganda. Bamburi Cement employs a total of 873 people (Bamburi Cement Company, 2014).

The aspect of green economy is reflected in the company's operations through its Lafarge Ecosystems, which is in charge of restoring Bamburi's used quarries, managing Haller Park (the rehabilitated South Quarry) and the Bamburi Forest Trails (restored North Quarry), and conducting a number of farming activities, including forestry and aquaculture, in the restored quarries. Quarry restoration projects by Lafarge Ecosystems started in 1971 and are ongoing, including, for example, the Kikambala Quarry, where tree planting is currently underway (Bamburi Cement Company, 2014).

### **STATEMENT OF THE PROBLEM**

Successful green practices helps firms to achieve greater efficiency, establish and strengthen their core competencies enhance their green image, all of these may eventually combine to contribute to firm profitability (Wong, 2012). Companies having higher scores on environmental criteria realize stronger financial returns than the overall market, whereas companies with poor scores have weaker returns (Ngniatedema & Li, 2014). Bose and Luo (2012) argue that green

economy strategies adoption not only helps to boost employees' morale but also enhance their loyalty to the company hence making the company gain competitive advantage, improve on its efficiency, and lower its operating costs. Environmental responsibility is being recognized not only by managers but also by consumers and stakeholders who are affected by unsustainable business (Nunes & Benet, 2010). Despite the incremental improvements in process efficiency that have been adopted by the cement industry in recent years, OPC production is still responsible for around 6% of all man-made global carbon emissions. The Cement Sustainability Initiative, developed by the World Business Council for Sustainable Development, brings together the major cement producers from across the world to try and tackle this problem (OECD/IEA and World Business Council for Sustainable Development, 2009). Fair (2003) observed that the cement companies are contributing a lot to Green House Gas emission and are emitting a lot of carbon to the environment, and therefore there is great need for them to adopt the green economy strategy for them avert the existing sustainability menace facing them. Table 1.1 reveals that Bamburi Cement Limited's financial performance for last five years indicates inconsistencies and regression in key performance indicators like return on assets, return on equity, and net income. For instance net income reduced by 21% in year 2015 (<http://www.lafarge.co.ke/>). Past related studies reveal that; Menzel et al. (2010) investigated whether companies could profit from greener manufacturing and found out that there was no significant relationship between greener manufacturing and corporate performance. Nune and Bennet (2010) did a study green operations initiatives in the automotive industry and established that the major vehicle manufacturers used green power like land fill gas, wind and solar energy as opposed to oil. Wong (2012) examined the influence of competitiveness on the success of green product innovation. The study revealed that green product and process innovation are positively associated with green product competitive advantage and green new product success. Ngniatedema and Li (2014) conducted an investigation on green operations and organization performance. The study established that companies in the manufacturing industries have a lower score in environmental impact and a higher score in green reputation than those in the services industry. Therefore it has been established that a quite number of previous studies used secondary data which was reportedly had shortcomings of missing data in some instances. Also no study has ever been carried out specifically on the effect of green economy strategies adoption on financial performance of Bamburi cement company, Kenya. The current study will adopt the use of both primary and secondary data in the analysis. It is against this background that the purpose of this study is to find out the effect of green economy strategies adoption on financial performance of Bamburi cement company, Kenya.

## **GENERAL OBJECTIVE**

The general objective of this study was to determine the effects of green economy strategies adoption on financial performance of Bamburi Cement Manufacturing Company in Kenya.

## **SPECIFIC OBJECTIVES**

1. To find out the effect of land rehabilitation strategy adoption on financial performance of Bamburi Cement Manufacturing Company in Kenya.
2. To determine how waste management strategy adoption affect the financial performance of Bamburi Cement company.
3. To establish the effect of emission reduction strategy adoption on financial performance of Bamburi Cement Company.
4. To find out the effect of alternative fuel strategy adoption on financial performance of Bamburi Cement Company.

## **THEORETICAL REVIEW**

### **Green Economic Theory**

Cato (2009) argues that Green economics seeks to move the target of our economy away from economic growth and towards flourishing, convivial human communities which do not threaten other species or the planet itself. It is inherently concerned with social justice since for a green economist equality and justice are at the heart of what we do and take precedence over considerations such as efficiency (Cato, 2009).

Green growth theory then starts from the simple observation that the natural environment is also a factor of production, but one which both classical growth theory, and historic patterns of economic growth in practice, have largely ignored (Nordhaus 1974, Solow 1974, Smulders 1999, Brock and Taylor 2005). The environment acts as a form of capital in three ways: it provides resources, it assimilates wastes, and it performs various 'environmental services' which sustain life, including climatic regulation and ecosystem health. This 'natural capital' has been undervalued both in economic theory and practice because it has been largely unpriced, provided as an apparently free gift of nature. Many of the environment's functions occur as common or collective goods without the property rights which attach to other factors of production, and without therefore the private incentive to value them properly in economic terms (Jacobs, 1991).

The standard economic concept to describe this is that of 'market failure'. Markets 'fail' when they do not take into account the full value of the activities within them. The production and consumption decisions which economic actors take are therefore distorted relative to those they would take if the environment were properly valued, in a whole series of ways. Natural resources tend to be over-exploited: soil eroded, fisheries depleted, water over-abstracted. Ecosystems which provide valuable services, such as wetlands and forests, are allowed to be degraded or destroyed. Resources such as energy and materials are used inefficiently, with an excessive generation of waste (and therefore pollution). And the amenity, health and cultural value of natural environments are under-appreciated.

In all these ways, green growth theory argues that current patterns of economic growth are *prima facie* sub-optimal. They misallocate resources between the different factors of production. They under-invest in natural capital, and over-invest in activities which cause its degradation. If these systematic market failures were corrected, growth might be higher. Indeed, the situation is worse than this, because in many countries the environmental costs of using natural resources are not just unpriced, but their exploitation is actually subsidized. Subsidies for extracting and using fossil fuels, and for other forms of resource extraction and agriculture, are estimated at around \$1.1 trillion per annum (Dobbs et al. 2011). Such subsidies further distort production and consumption decisions away from their optimal path. From these premises, advocates of green growth argue that a range of different environmental measures and policies can be growth-generating. In developing countries, much of the emphasis has been on the conservation and enhancement of natural capital, such as soil quality, fisheries, forests and habitats such as mangrove swamps and coral reefs. Arguing that in economies dependent on these resources, the net depreciation of natural capital is a retardant of growth in the same way that the net depreciation of physical capital would be.

The United Nations Environment Programme has gathered considerable evidence on the positive growth impact available from the conservation and sustainable management of natural resources (UNEP 2011). In some cases this arises from higher productivity in production of the resource; in others from the development of secondary, value adding, products which conservation of the resource allows; in some from the development of related industries, such as tourism. The UNEP report points out that many of these resources are controlled by the poor, and so strategies to conserve them and enhance their productivity are poverty-reducing as well as growth enhancing. Some of these growth benefits clearly show up in higher incomes, so are captured by the conventional growth indicator of GDP (gross domestic product). But others are unmeasured: it is difficult to capture the value which preservation of a mangrove swamp has for coastal defense, for example, or a forest for water supply.

### **Resource Based View**

The theory of resource-based view (RBV) posits that each organization is endowed with a finite amount of resources. RBV theoretically predicts intangible resources as the important factors for firm success (Amit and Schoemaker, 1993). Penrose (1959) is identified as one of the earliest major contributors to the theoretical underpinnings of the RBV (Kor and Mahoney, 2000). The heterogeneity approach posits that a firm does not achieve competitiveness because of their resources but because of its competence in making better use of its resources whereby the productive services of resources must be discovered over time as entrepreneurs interact with its resources and make subjective decision about resource allocation, deployment and maintenance (Penrose, 1959).

Technological leads, Production/process experience, customer loyalty and machine capacity are also resources of the firm (Wernerfelt, 1984). Wernerfelt (1984) further states that resources and

products are two sides of the same coin for a firm. By specifying the size of the firm's activity in different product markets, it is possible to infer the minimum necessary resource commitments. Conversely by specifying a resource profile for a firm, it is possible to find the optimal product-market activities. To address key issues in the formulation of strategy for diversified firms by Wernerfelt (1984) propose that firms should look at its resources rather than the traditional product perspective so as to achieve different immediate insights.

Firms can also be able to identify types of resources which can lead to high profits. Adopting and implementing green operations practices while striking a balance between exploitation of existing resources, development of new strategies and purchase of a bundle of resources in a highly imperfect market by basing the purchase on rare resources can maximize this imperfection increasing chances of buying cheap and getting good returns.

## **EMPIRICAL REVIEW**

Ngniatedema and Li (2014) carried out a study on the relationship between green operations and organizational performance in top 500 publicly traded companies in the United States of America. Based on metrics for environmental impact and green reputation, manufacturing companies scored lower on the environmental impact metric and higher on the green reputation metric than companies in the service industries. The overall impact of green operations was found to be different between the manufacturing and service firms studied. For manufacturing firm's environmental impact score and green policies and performance score were found to have an impact on organizational performance; while green reputation plays a more important role in impacting the organizational performance of service firms.

Wong (2012) conducted an investigation on the influence of green product competitiveness on the success of green product innovation. The researcher carried out this study in China and his target population was R&D project leaders of electronics firms. The study found out that green product and process innovation are positively associated with green product competitive advantage and green new product success. It also found out that green product competitive advantage partially mediates the relationship between green product / process innovations and green new product success.

Jose et al. (2009) did a literature review of the quantitative studies that have analyzed the impact of green management on financial performance. A total of 32 studies were identified, examining the environmental variables used, the financial performance variables, the statistical analyses, and the main findings obtained by the studies. Some of the studies quoted in the literature are Hutchinson (1996) analyzed the integration of environmental policy with business strategy studying several firms. Marcus and Geffen (1998) studied the processes by which distinctive competencies are acquired based on the case of pollution prevention in electric generation. Enz and Siguaw (1999) examined four hotels that agreed that cost savings, operating efficiencies and excellent marketing opportunities derived from their environmental initiatives. The Findings

were mixed, but studies where a positive impact of environment on financial performance is obtained were predominant. In addition, the findings show that the set of firms, industries and countries are varied. Some studies use environmental management variables and other works employ environmental performance variables, and regression analysis prevails. The study however does not consider studies that analyze the influence of environmental management on environmental performance. The study offers interesting implications for managers, pointing out that a real commitment to green management may result in a positive influence on financial performance.

Nunes and Benet (2010) did an environmental report analysis and benchmarking study on green operations initiatives in the automotive industry. They focused on investigating and benchmarking green operations in the automotive industry documented in the environmental reports of selected companies. The investigation road mapped the main environmental initiatives taken by the world's three major manufacturers and benchmarked them against each other. The results show that the world's three major car manufacturers are pursuing various environmental initiatives involving the following green operations practices: green buildings, eco-design, green supply chain, green manufacturing, reverse logistics and innovation.

Nishant (2012) did an empirical examination on green information system and organizational performance by using data from secondary sources. The study found out that research in the area was relatively sparse. Bose and Luo (2012) found out that the likelihood that companies would adopt green IT initiatives depend on both environmental and organizational factors of which the primary one being champion support. The support of a champion is very critical since he is the one who coordinates the implementation process based on his education and attitude (Bose & Luo, 2012). A study on Green Operations and organizational performance by Ngniatedema and Li (2014) revealed that companies in the manufacturing industries had a lower score in environmental impact and a higher score in green reputation than those in the service industry.

Menzel et al. (2010) did a study to investigate the trend and effect of environmentally friendly manufacturing on the financial performance of companies in the European automotive and pharmaceutical industries specific attention given to resource utilization. The method of research was a survey of annual and sustainability reports published by companies and recording the change in resource usage as well as the financial performance of the companies. The study showed no significant relationship between greener manufacturing and corporate performance. However, a trend in decreasing resources, specifically electricity was found. Furthermore, a trend in reducing carbon was also found.

## **RESEARCH METHODOLOGY**

### **Research design**

A descriptive research design was adopted in this study. A descriptive survey demonstrates relationships by assessing samples at one point without trying to make inferences or causal

statements (Merriam & Merriam, 2009). A descriptive design was adopted since the key aim of this study was to determine the relationship between green economy strategy adoption and financial performance of cement manufacturing companies in Kenya while the descriptive survey was to show an in-depth investigation on not only the significance of green economy strategy adoption on the performance of the Bamburi Cement Manufacturing Company but it also explored the challenges of adopting and possible strategies that could be used to improve the financial performance of green operations in the Kenyan cement manufacturing industry.

### **Target Population**

The study was carried out in Bamburi Cement Manufacturing Company. The target population for this study was the company's employees, comprising of both the top level management and the staff from each unit of the company namely the commercial department, department of corporate planning, department of environmental conservation, and department of Construction and Commissioning. In this regard, the total number of employees at Bamburi Cement Manufacturing Company was 965.

### **Sampling Technique**

Owing to a number of practical and theoretical reasons, the researcher adopted a stratified sampling method. Babbie (2007) posit that stratified random sampling is appropriate when the population is not homogeneous. In this case, in choosing the study sample, the population of Bamburi Cement Manufacturing Company was divided into small groups (segments), which were; the commercial department, department of corporate planning, department of environmental conservation, and department of construction and commissioning. Thereafter, a random sample of employees was chosen from each segment of the company.

### **Sample Size**

The research subjects were selected from 5 different units of the company namely; commercial department, department of corporate planning, department of environmental conservation, and department of construction and commissioning. From each unit, 10 % of employees were selected for the survey. Given that the total population at the company was 965, then it was apparent that the representative sample for the study was 96 employees which accounted for 10% of the entire population. According to Cochran (1993), a sample size of ten per cent of the target population selected using random sampling is appropriate for a descriptive research.

### **Data Collection Tools**

The study used both primary and secondary data. Secondary data which was Return on Investment (ROI) which was obtained from published financial reports of Bamburi Cement Manufacturing Company. Primary data was collected using a structured questionnaire that was administered through the "drop and pick later" method. The structured questions were used in an

effort to conserve time as well as money and to facilitate in easier analysis as they were in immediate usable form. The questionnaire consisted of three sections. Section A sought to ascertain the demographic information. Section B on its part sought to identify information on green operations practices whereas section C gathered data pertaining to the challenges experienced by Bamburi Cement Manufacturing Company in adopting green operations practices.

### **Data Analysis**

Once the raw data had been collected it was edited for completeness, consistency as well as accuracy. It was then systematically organized to confirm if it represented the target population and to facilitate objective analysis. Thereafter, the data analysis tool called the Statistical Package for Social Scientists, commonly known by the acronym SPSS, was used to analyze quantitative data, to give a deeper insight into the responses obtained from the respondents pertaining to the subject of the research. Descriptive statistics like mean, mode, median, and standard deviation were used for the analysis. Also inferential statistics like Correlation and Regression analysis were conducted to ascertain how green economy strategies adoption predicted the financial performance measures of the company. Most importantly, data was presented by graphs, pie charts, and frequency tables. Regression analysis model was used to predict the effect of green economy strategies adoption on the financial performance of Bamburi Cement Company.

$$Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon_i,$$

Where: Y = Financial Performance; X<sub>1</sub> = Land rehabilitation; X<sub>2</sub> = Waste management practice; X<sub>3</sub> = Emission reduction; X<sub>4</sub> = Alternative fuel;  $\epsilon_i$  = random errors.

Data was presented in form of pie charts and graphs. The key reason for presenting data in form of pie charts and graphs was based upon the fact that these two components communicate information visually.

## **RESEARCH RESULTS**

### **Land Rehabilitation**

The respondents expressed a moderate opinion that Bamburi Cement Company, Kenya had adopted land rehabilitation strategy. This opinion was represented by an aggregate mean score of 3.09 and standard deviation of 1.325 hence they were neutral about it. The respondents disagreed that the quarry site had been rehabilitated by the planting of trees. They also disagreed that the company had any intention to develop more lakes and canal in the quarry area. The study found out that hotel and catering services were offered to visitors touring the park, games activities like jogging, walking and cycling were done through the forest.

## **Waste Management**

The findings from waste management strategy adoption indicated an aggregate mean score 3.07 implying that the respondents were neutral regarding the adoption of this strategy by their organization. The study found out that though waste tyres were disposed by burning them in kiln, the practice was not frequently done. Also it was found that material transport system had not been set to the standard that would reduce spillage. It was established that recycling programme for paper and printer ink cartridges was one more often.

## **Emission Reduction**

On the issue of emission reduction strategy adoption, respondents expressed a moderate opinion with a mean score of 3.03 about it. A mean score of 3.12 represented their opinion on this. The respondents disagreed that the company had put in place bag filters technology for emission reduction. The study further found out that some of the opacity meters at the main stacks were not working and therefore couldn't assess dust emission. It was established that the company had planted some trees around the industry to help curb carbon dioxide.

## **Alternative Fuel**

The respondents were neutral about their organization's adoption of alternative fuel use with an aggregate mean score of 3.12 and a standard deviation 1.323. The study established that the use of ethanol and hydrogen was not frequently done. However, it was found out that the use of solar energy and wind power was frequently practiced.

## **INFERENCE STATISTICS**

Sekaran (2003) defines inferential statistics as statistical results that let us draw conclusions from a sample to population. This study used Correlation and Regression Analysis to make inferences. The study used Pearson correlation coefficient to examine presence or absence of correlation between land rehabilitation, waste management, emission reduction, and alternative fuel as green economy strategies affecting the financial performance of Bamburi Cement Company, Kenya. From the findings, it was established that there was a weak negative relationship between land rehabilitation and waste management with a correlation coefficient of -0.39. There was a weak positive relationship between land rehabilitation and emission reduction with a correlation coefficient of .040. The highest correlation coefficient (0.447) was between Alternative Fuel and Financial Performance. This implies that there was a medium positive relationship between alternative fuel usage and financial performance of Bamburi Cement, Kenya. This was followed by (0.47) which was between Waste Management and Financial Performance. The findings further reveal that the rest of independent variables; emission reduction, and land rehabilitation had a moderate positive relationship with the dependent variable (financial performance). The study noted that there was a weak relationship among the independent variables. The study

disagrees with the Menzel et.al (2010) who found out no significant relationship between green manufacturing and corporate performance.

Regression model was used during the study to predict the magnitude to which land rehabilitation, waste management, emission reduction, and alternative fuels strategies adoption affected financial performance of Bamburi Cement Company, Kenya. The table below presents the results of the regression model coefficients.

**Table 1: Regression model Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.020	.015		-1.347	.181
Land rehabilitation	.252	.002	.627	124.607	.000
Waste management	.251	.002	.589	115.631	.000
Emission reduction	.253	.002	.534	104.806	.000
Alternative fuel	.253	.002	.624	123.057	.000

a. Dependent Variable: financial performance

The regression equation bellow’s coefficients are derived from table 4.9 column labeled ‘unstandardized B coefficients’.

$$Y = -0.020 + 0.252X_1 + 0.251X_2 + 0.253X_3 + 0.253X_4$$

From the regression model coefficients, land rehabilitation was the best predictor with Beta of 0.627 and the least predictor was emission reduction with Beta of 0.534.

**Table 2: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999 <sup>a</sup>	.998	.998	.026

a. Predictors: (Constant), land rehabilitation, waste management, emission reduction, alternative fuels

b. Dependent Variable: financial performance

The findings from the regression model summary revealed an R Square of 0.998 (99.8%). This implies that 99.8% of the variation in the dependent variable (financial performance) can be explained by the independent variables (land rehabilitation, waste management, emission reduction, and alternative fuel). The remaining 0.2% of the variation in financial performance is explained by the error term or by the variables not introduced in the model. Therefore it shows that the model is good for prediction. This concurs with Omonge (2013) who argues that

incorporation of green practices in the operations of organizations should form part of the long term strategy of the organizations to gain competitive advantage over its competitors.

## **CONCLUSIONS**

### **Land Rehabilitation**

The study found out that Bamburi Cement had moderately adopted land rehabilitation strategy. This is because some quarry site had no trees planted on them and the company had no plans to develop lakes and canals in the quarry area. Therefore it was noted that the management had done little towards the implementation of this strategy.

### **Waste Management**

Waste management strategy adoption also had an aggregate mean score of 3.07 showing that the respondents expressed neutral opinion on their company's adoption of this strategy. The study found that recycling programme for paper and ink cartridges was practiced but the disposal of waste tyres by burning them in the kiln was rarely done.

### **Emission Reduction**

The study also revealed that emission reduction was moderately practiced with a mean aggregate of 3.03 and respondents expressed neutral opinion about the same. It was established that there was absence of bag filters technology for emission reduction but some trees had been planted around the industry to absorb carbon dioxide.

### **Alternative Fuel**

The respondents expressed a neutral opinion about alternative fuel use with an aggregate mean score of 3.12. The study found out that solar energy and wind power was highly use whereas propane, natural gas, hydrogen, and ethanol were rarely used.

## **RECOMMENDATIONS**

### **Land Rehabilitation**

The study recommends that Bamburi Cement Company, Kenya put in place measures to rehabilitate its quarry sites by planting more trees. The study further recommends that the management of this company should plan on developing more lakes and canals in the quarry area as a way of rehabilitation

### **Waste Management**

The study recommends that Bamburi Cement should ensure that waste tyres are frequently burnt in kilns. More kilns should be developed to enhance efficiency. The company should improve on its transport systems to ensure that no spillage during the transportation of materials.

## **Emission Reduction**

Bamburi Cement Company, Kenya should adopt more bag filters technology to enhance emission reduction. The company should also put in place more opacity meters at main stack to continuously assess dust emission.

## **Alternative Fuel**

The study recommends that Bamburi Cement Company, Kenya practice the use of ethanol and hydrogen as alternative fuel to petroleum. The study further recommend that solar energy and wind power usage be increased by the company

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