ENVIRONMENTAL SUSTAINABILITY: A STRATEGY IN MULTINATIONAL MANUFACTURING FIRMS AND PANACEA FOR OPERATIONAL EFFICIENCY IN RWANDA.

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Abstract

Environmental sustainability is a current issue in financial reporting worldwide and it is an important factor to consider for the business continuity and growth. The objective of this study was to examine the effect of environmental sustainability on multinational manufacturing operational efficiency in Rwanda. The survey design was used to collect primary data which helped in gathering the respondents views on the employment health and safety, environmental protection mechanisms, and corporate social responsibility responsiveness by three multinational manufacturing firms. The multiple regression analysis was performed and the statistical evidence has demonstrated that employment health and safety, environmental protection, and CSR have positive and significant effect on multinational manufacturing operational efficiency in Rwanda. The study recommended that manufacturing firms in Rwanda should implement the environmental protections measures so that the external environmental issues should be addressed especially in terms of air pollution, waste disposal, reduction of Co2 and even land or soil used.

Key words: Efficiency, Environment, Firm, Multinational, Manufacturing, Operations, Sustainability, Strategy,

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Introduction

The world today is characterized by climate change which is from negative effects of the manufacturing firms that produce needed products and services to meet the needs and desires of their customers and satisfy their shareholders aspirations in terms of generating the profits. Such aim has been in the mind of many managers of multinational manufacturing firms who have been only concerned by the production for market satisfaction without analyzing the effects of the companies' production processes on the environment and without thinking of their operations efficiency (Duke-II& Kankpang, 2013; Enofe, Mgbame, Obazee & Edeoghon, 2013).

On international scene, the issue of environmental sustainability has been in discussion from relevant international bodies. The recent sustainability discussion and resolution were made in the year 2015. The United Nations Sustainable Development Summit that was held on September 25, 2015 attracted the attention of many countries leaders and this summit get the 2030 Agenda for Sustainable Development and 17 Sustainable Development Goals (SDGs) were set to deal with world poverty, fight inequality and injustice and attempt to solve problems created by climate change by the year 2030. This shows that many countries (195) were represented in Paris to attend SDGs set and every nation represented committed a vow to lower the negative effects of manufacturing sector to the destruction of the planet. This is planned to involve each and every individual, companies, NGOs and even government entities which are required to set rules, regulations and policies to deal with climate change towards sustainable development in all sectors of economic life (Ezejiofor, Akamelu & Chigbo, 2016).

Organizations live in an environmental system that has a significant direct or indirect influence on their transactions and activities. The knowledge of such system should be the focus of management task and helps in strategically reposition of companies' production in order to consistently survive the challenging environment (Murphy, 2003). In today's environmental change, manufacturing companies are becoming aware of their corporate responsibility related to the environmental destruction and negative social effects of their operations on the lives of the immediate communities and other different stakeholders. Thus, such responsibility plays a role in restructuring their production processes used in the production of products and services that they generate for the satisfaction of human needs. This shows that their concern is no longer shareholders satisfaction but the general overview of all stakeholders interests specifically for the entire society, because the manufacturing companies do not operate in a vacuum. The company's main objective is no longer shareholders wealth maximization only but is now inclusive of all stakeholders. This shows that the concern has shifted from owners of money/capital to other direct or indirect benefits to all direct and indirect contributors for the search of sustainability of environment (Ekwueme, 2011).

Aondoaka (2015) is of the opinion that the manufacturing companies managers are paying mostly attention to the environmental sustainability and align their production with the environmental sustainability, this is because concentration on production and profit making is no longer the option considering the effect of environment of their operations. The manufacturing companies focus on reduction of hazards, work accidents, lack of quality of products, relevance of raw materials use, relationships, etc as tools for their future prosperity. This pushes them to become more open, transparent and accountable about how the handle environmental issues in terms of their waste, reduction of CO2 and target their recycle of used products and even manufacture useful material that cannot harm the environment and are investing in environmental protection in order to become a contributing corporate citizens who care about social, economic, environment, and relationship effects on business operations.

It is the requirement for each multinational manufacturing company to deal with its operations where all production processes should focus on the waste management, recycling of the used packages, reduce the emissions that are sent to the planet which destroy the ozone layer. These companies are required to play their roles in helping the countries in which their plants are set and their operations are conducted to achieve the 2030 SDGs. Managers of these companies are required to restructure their businesses and include environmental sustainability in operational activities. These companies are pointed as key environment destroyers and each country aims at increasing the manufacturing industries which produce products that lower the level of import and increase the level of export to generate more foreign income (Enofe, Mgbame, Obazee & Edeoghon, 2013).

Manufacturing companies are aware of their production processes which generate carbon and waste which have negative effects on the immediate environment (work-place) and other general negative effects which concern the whole universe. Thus, such negative effects affects even the producers because the lack of waste management constitutes a big cost or loss that manufacturing companies incur especially in disposing them from the production process. This means that there no specific place to store or keep the waste expect looking for a land where they can put them and destroy them and even dig large whole as last waste store where their evaporation which contaminate the air and as result new diseases will follow (Faboyede, 2011).

Mostly, multinational manufacturing firms depend on resources that come from the nature or the environment, such as water, minerals and sand, thus, there should be sustainability business strategy that helps in reducing the production costs and environmental negative effects that contaminate the social life of the people and other living creatures. There is need in such companies to adopt strategies such as waste reduction, reuse of semi-products or packages, recovery of the packages used and recycle because once there is no strategy to reduce the waste and environmental pollution by every producing entity, the SDGs will not be achieved at national and global levels. Thus, environmental protection starts with each and every person either individual or corporate, private or public, profit making or NGO (Okoye & Ezejiofor, 2013).

Through environmental sustainability, the manufacturing firms should set medium and long term strategies that should be useful in dealing with their operations with the main objective of reducing the environmental negative effects of their production. This shows that such companies are responsible to their internal and external stakeholders who once are not satisfied with the environmental contribution of the firms would be a challenge to the business and therefore, it will be difficult to continue the business and satisfy shareholders wealth creation. There are some products that are created by companies and that harm a certain category of people, such as alcoholic products which damage the life of youth under 18 years, thus, the manufacturing companies should play their role and responsibility in mobilizing youth that drinking habits at the younger age is dangerous and prohibited. The manufacturing firms of tobacco products should have budget and strategies to sensitize the people that smoking is dangerous to life, thus, such activities reduce the firms environmental effects and create business sustainability (Okwesili, Chinyere & Iroko, 2016).

Multinational manufacturing firms should also play their social responsibility role is positively affecting the lives of the communities in which they operate from. There should be strategies that to deal with the environmental sustainability which deal with water, consume energy, effluents and waste, working environment health and safety, human rights, responsible consumption, diversity and equal opportunity to employees and ant-corruption activities. The development of code of business principles is a key factor that helps manufacturing companies to deal with individual and communities commitments in terms of social responsibility (Kwak, 2013).

In African perspective, there are some initiatives to be developed such as sponsoring basic education, providing quality based healthcare facilities, and other basic infrastructures that improve quality of life for the communities in which manufacturing firms operate from. The multinational manufacturing firms often work hand in hand in financing local and international NGOs which are specialized in humanitarian activities and are major donors to those organizations where they sign contracts on welfare projects such as water delivery, hygiene and sanitation, construction of nursery school and primary schools and education on saving and credits use etc. These projects aim at changing the life conditions for the citizens even if there may not bring monetary benefits to manufacturing companies immediately but create business value in the long term (Aondoaka, 2015; Hasan & Hakan, 2012; Okoye & Ezejiofor, 2013).

In Rwanda, multinational manufacturing companies play an important role in dealing with environmental sustainability, they have gone far beyond the strategy of managing their reputation through the corporate social responsibility to the resources management such as producing quality based products, saving water and energy, working in a safe place where they do no longer operate from the valleys but from the industrial and special economic zones, where they have all the facilities needed such as water and energy which also are used effectively, employees work in good conditions and all have work hazards insurance cover, are trained and retained.

The environmental sustainability is considered as a key factor that will improve the continuity of manufacturing companies in Rwanda. Thus, the internal environmental sustainability is taken as relevant factor where employees motivation is emphasized so that the production and service delivery processes become effective. The external environmental also is taken care of, where manufacturing companies provide necessities to vulnerable families where each company has its way of attending to the people in need such as Tutsis Genocide widows and orphans, old people communities, educational infrastructures and school materials distribution, healthcare medical insurance provision to the people without financial capacity, community work commonly known as Umuganda where each company has a specific zone or area to take care of in terms of cleaning, maintenance, and planting of trees on a monthly basis (Tijiani, 2014).

The manufacturing companies mostly emerged in mass production since 18th century and has affected in one way of the other the daily life of many creatures such as human, animals and other biodiversity livings. This is based on the fact that they introduced the production which uses sophisticated machines consuming coal, petrol, woods and even energy which produce air pollution, damage ozone layer and which send waste to the environment. There is negative effects on the environmental sustainability in a way that the mass production decreased the environmental usefulness by the livings (Ngwakwe, 2008).

The mass production also was affected by the increase in the world population which grows every year and people consumable products and services are doubled, thus, multinational manufacturing firms exploited more the natural resources in order to respond to the mass population of the world and there was no remediation to the negative impact caused by the mass production which required the use of chemicals than modern technological thinking. The manufacturing companies production should be based on the analysis of the business environment where social, economic, and environmental segments should be included in business strategic plan. The production efficiency is needed in order to reduce the effects of depletion of natural resources, land degradation and air contamination or pollution. This reduction should be addressed by all the manufacturing companies, government agencies, NGOs and individuals where there lack of forests, clean water, misuse of land should be addressed in all human activities (Ndu & Nkamnebe, 2013).

The climate change is manifested in all the countries of the world, developed, developing and even third world. The presence of greenhouse gas emission, damage of ozone layer are negative impact that results from human activities, thus, his sustainability and future are not guaranteed. The climate change favored inundations which takes land, properties, generates diseases and takes away the economic and social infrastructures which put in danger the national, regional and global economy. Because of such impact, the human needs satisfaction requires to the governments and other regional and global bodies to think and create chemicals, fertilizers and pesticides products that have negative impact on water, soil and air (Henderson, 2015).

Therefore, the manufacturing companies operations are not efficient because of the cost of remediation of the environmental impact in their area of operations. The investments are damaged because of lack of environmental precautions and poor strategies in dealing with the negative impact of dissertation, air pollution and waste management is very costly to manufacturing companies. The lack of environmental sustainability strategies leads companies to operate in irrelevant costs that would be minimized if there is an environmental concern for the long term existence (Hasan & Hakan, 2012).

Many countries still developing and consider their manufacturing sectors as important in generating employment and improve national economy without thinking and putting in place the strategic dimensions of dealing with waste, air pollution and loss of the natural resources in the sacrifice of human satisfaction. Their production methods are using non renewable resources instead of thinking of the use of renewable energy as main source of raw materials for manufacturing process that cannot harm the environment. Till today there is still change in mass production which should be replace by green production that can only be achieved through research and development (Tijiani, 2014).

The objective of this study is to examine the effect of environmental sustainability on manufacturing operational efficiency in selected companies in Kigali. Based on this a question was formulated as what is the effect of environmental sustainability on manufacturing operational efficiency in selected companies in Kigali?

Literature

Environmental Sustainability

We cannot understand the concept of environmental sustainability without defining the notion of sustainability. It is the capacity or ability to endure a certain activity for a long period of time and even better activity permanence. Thus, environmental sustainability refers to the process of making sure that the present activities of a business are carried in way that cohabitates with environment. The business activities such as manufacturing are conducted in the natural environment without harming it or destroy it. Environmental sustainability requires the human activities to be carried out in consuming the natural resources at a percentage at which those resources are brought back naturally for future use (Onsrud & Simon, 2013).

Presently, it is the responsibility of managers to carry out manufacturing activities in a sustainable way, that helps to satisfy human needs without harming his future living conditions.

Environmental sustainability entails producing goods and services that respond to human and other livings in the ecosystem in an environmentally sound processes which do not harm environment while protecting water, energy and others resources. This would be done if the manufacturing companies discover new ways of producing without negative impact on human, animals and plants that live based on the environment status and also empower their well-being in their area of living (Adedeji & Eziyi, 2010).

Natural resources are to be used friendly, this means that the renewable resources should be used sustainably where the rate of consumption should be less than the rate of regeneration or renewal. For instance, the forests harvesting should be done if there are other trees that have been planted are grown to provide the clean air and attract rain to avoid deforestation that brings desert and climate change. In case of non-renewable resources there should be first of all R& D strategies to find the substitutions otherwise the harvest of non-renewable resources should not be feasible since there will be human needs without support in the future and the quantity of waste should have been taken care of so that it does not exceed the adoption capacity by the natural environment. Thus, the creation of environmental managers in each and every manufacturing company is a prerequisite for the environmental sustainability who should analyze and strategically plan for their companies' business sustainability through the working environmental and surrounding communities needs (Rabah, Ibrahim, Ijah & Manga, 2011).

Since the environment is fundamental for human, animals, plants and other biotic creatures, its sustainability should be a concern for every human being for their survival and improved living conditions. Thus, manufacturing companies should not dispose toxic substances or waste residuals anyhow, anywhere because they destroy and harm the environment which requires them to spend more in remediating the negative effects of such activities of disposals. The reasonable way of managing the waste is to recycle them so that they become usable for the companies or other beneficiaries who will pay a little but significant money as additional income to the main organizational source of income and keep the equilibrium of the natural environment (Chukwuma, Tagbo, Anike, Obinna & Ikechukwu, 2012).

Environmental sustainability which is the ability or environmental capacity to provide human and other living creatures subsistence is a key factor that sustains the social, economic and ecological aspects for the present and future needs of the beneficiaries. Thus, all the human activities should be directed in that sustainability vision where all of his activities such as products and services provision, housing, land planning and use, infrastructure development provision, and other urban needs should be addressed based on sustainable decision. This requires that human needs satisfaction by manufacturing companies should focus on producing the products that aim at meeting the consumers present needs with no intention to compromise the environmental capacity or ability of meeting the future relevant requirements (Adedeji & Eziyi, 2010; Olayinka, 2012).

The environmental sustainability in manufacturing companies is measured in terms of corporate social responsibility intentions, social occupational health and safety, environmental protection and manufacturing processes standards.

Corporate Social Responsibility

Companies create value in the society which is measured in terms of community solidarity or CSR which is the willingness of helping other people in terms of promoting their welfare and impact their lives without considering the direct or indirect return. This leads to solving the society's problem because sincerely there is a passion in the one that provides financial resources or other kind of support to the community. This is creating new life style for the community in general where common needs are satisfied or redistribution of income is transferred and shared within the community members, such act is considered as accounting ethical since companies are involved in sharing part of their income in supporting the community economic and social development and measures the fairness, values and organizational ethical consideration (Paskov & Dewilde, 2012).

It is believed that there is no business that operates in total isolation and independently without the involvement of the society. The development, existence and future sustainability of any business is based on the social interaction between a firm and citizens that surround it. The economic development and company's performance depend of the existence of customers or consumers to its products or services. Therefore, it is the responsibility of management to socialize with the citizens in helping those that are in need even if they do not have purchasing power to consumer, with time they will be empowered (Akanbi & Ofoegbu, 2012).

The CSR is manifested by the company's contribution to the poverty reduction production, developmental projects that are established in the society to the development of the citizens of a given village, helping in education of the children with disabled parents, improving health conditions, and other many social activities that improve the life condition for the citizens even if they do not consumers of company's products or services (Pramanik, 2008). The contribution of firms to the community is a key tool for measuring its social contribution through corporate social responsibility (CSR) and survival indicator because the common definition of CSR is the contribution of company to the citizens of a given area where the company's operations are held (Hopwood, 2009).

CSR is very crucial element to consider by companies in order to reduce the negative effects that suffer the vulnerable people in a given society where companies operate from. The financial support to be provided by those firms are related to payment of social financial assistance, provide care and children rights and protection against disease and death of less than 5 years in under developed and developing countries. Thus, these financial resources sacrificed constitute social responsibility of business decision making process and reveals the commitment of the company towards its stakeholders (NZBCSD, 2010). CSR is considered to be whatever contribution of the company towards the economic and social development of the staff, their family members even the local communities where they operate from.

The companies are expected to contribution to the community solidarity in terms of helping the communities that surround them where firms contribute to the welfare of the citizens in which they operate in terms of providing them pure water, improving quality of education, satisfying the health challenges of the society. Even social activities like support young groups, clubs, games, and even support their training in self-employment where companies play a key role in supporting them and even provide financial resources or loans and credits then make a follow up about the strategic plan of such associations (Duke-II & Kankpang, 2013; Ekwueme, 2011).

Companies should ethically solve the surrounding society's problems so that it becomes relevant stakeholders in the long run. This is based on the fact that the challenges of the society which are not solved will become the problem and handicap to the companies that work in such environment. The corporate social responsibility has been considered as key issue in today's business survival and growth. This is the core value of the companies to the society and most of the time is translated in terms of financial measurements where companies consider their contribution in terms of operating costs (Akanbi & Ofoegbu, 2012).

The CSR is instrumental to the value creation and it creates awareness of the companies in the society and the members of the society become partners of the business. Thus, the ethical behaviors of the company is manifested in the interests of all stakeholders of the company not only in the interests of shareholders who actually needs return of their investments. The value creation should be emphasized in a such a way that it leads to increased value of the stakeholders wealth. The building of company's reputation and trust to the entire group of stakeholders is accepted and by all corporate aspects of the business, the social contribution to the society, environmental protection and recognition of staff rights are positively linked to the performance of firms because they operate in an environmental where social needs affect in one way or the other what companies do as operating activities (Schreck, 2011).

In the same way Rituparna (1999) posited that every firm should make a clear balance between its economic goals and society' needs satisfaction, thus, it becomes a social accounting issue where not only economic benefits are considered or pursued as if a company lives and operates in the total isolation, but also management of companies are to balance economy, social, environment and allocate their resources accordingly.

Moneva and Ortas (2010) are of the opinion that environmental protection is an issue that involves finance of an entity and in order to play its role of social responsibility, company needs to evaluate its effects on the destruction/ pollution of the environment in general and where it works or operates from, thus, once entities' management understands their effects on the surrounding environment there will be a sense of commitment to the social needs of the society and should merge them with their financial needs and try to do something as if they have social contract to pay and will be done in the analysis of the cost-benefit in the long run.

CSR is relevant concern in the existence and sustainability of an business entity that operates in challenging environment. This emphasizes that the goals and objectives of the company should be beyond the normal economic goals to the social oriented goals, this is in fact justified by going beyond economic growth and gains realization for business companies. There is no business that can be sustained if there its environment is not safe, thus, managers of corporations should be concerned by what is in the immediate business environment and strategize how to solve social, and environment problems so that they do not affect its existence and sustainability and this leads to inclusive economic, social and environmental growth which have to move together (Singha & Dhingrab, 2012).

The benefits of CSR have been discussed in the literature and the summary is that it reduces the operating costs, motivates employees to work hard and increase their productivity, it is a signal of business risk, and promotes the company's image (Pettenella, 2010). CSR helps the companies to built their strong relationships within the community in which the operate from and this is done through the good reputation of the company which in return generates fruits in terms of good and positive understanding between the company and its surrounding environment of community. The participation of the firms in their community is manifested also in terms of employment creation where the members of the community get jobs within the company with very high level of commitment and finally the company involvement in community work of economic development and profit sharing, generates new business environment and enhances the leadership skills of the managers (NZBCSD, 2010).

CSR as a key measurement of accounting ethics shows that it is the responsibility of businesses to support and maintain the society in which they operate from socially, economically, environmentally and mitigate the risks related to such activities and the corporate governance should focus on the wellness of the stakeholders in partnership with the firms (Cordero, Zúñiga & Rueda, 2014).

Employment Health and Safety

One of the environmental sustainability measurement is employees protection. This is to say that employees should be protected again work accident and life damage which all can be caused by unfair work practices where companies do not have work protection standards. The working policies and standards from relevant workforce bodies show that companies are to create and maintain a healthy and safe working environment that allow their employees to feel secured and work hard. Therefore, harmful events are to be prevented and eliminated from the employment zones, working safely standards are to be complied with, employees capabilities and culture are to be internalized with zero tolerance to harmful activities (Abayomi & Ayobami, 2012).

The manufacturing especially have to implement working policies that enhance equal opportunities for employees learning, growth and career development. This leads to organizational citizenship and performance. Once employees are included in every aspect of the business and feel comfortable and their work performance becomes better especially if they are treated fairly, without separation based on tribe, nationality, gender and religion affiliation. Thus, it is the management responsibility to engage funds in healthy and safe working environment. All the human rights standards have to be obeyed by manufacturing companies and there should management commitment to such practices where employees are more human than working machines (Chukwuma, Tagbo, Anike, Obinna & Ikechukwu, 2012; Duke-II & Kankpang, 2013; Schreck, 2011).

Environmental Protection

There is a call from each country's government to the business companies and even to the individuals that there should be a combination of efforts towards the protection of the environment because the effects of human activities on it are vast and irremediable if only governments operate in isolation. This is relevant to business or firms whose managers are to mobilize and put in their annual budget the amount of money that will be spent in the environmental protection and even plan a community work where the staff, management and surrounding society put their efforts together in order to clean or plan the plants that will bring good air in their environment (Jui-Che & Huang, 2015).

Today's reporting system of all the companies are regulated so that they include in their narrative report the amounts and activities that were performed during the year in the relation with the environmental protection. This is a required content of the voluntary and mandatory disclosures that help to analyze and measure the sustainability of the business for the future (Jones, 2010). It is a current obligation to the management of any business to disclose or prepare an environmental accounting or report in order to show what it does in order to secure its working environment. The information about the business environment contribution requires financial and non-financial information that helps the process of economic and environment decision making and shows the environmental status to the decision makers. Thus, investment in business environment is a paramount issue in measuring the future sustainability of the companies (Shofiqul, Miah & Fakir, 2015).

It is a task of management to evaluate and plan for the current and future status of the business they manage and measure the effects of their services and products to the environment. It the role of accountants to identify and report the environmental costs incurred and the prospective lost that a firm may incur if nothing is done to its business environment (Tanc & Gokoglan, 2015). Social accounting posits that environmental protection is key contribution of the companies. This is directly or indirectly linked to what company does that affect the environment in terms of pollution from its factories or indirectly related to the natural environment where the company operates from, such as forestry, garden of the compound, the climate in the working place and even in the society that surrounds its offices. It requires a certain portion of company's finances that must be paid to the society so that such support may help in repairing or maintaining the order so that for instance the society epidemics may be avoided, so that the erosion may be managed in giving value to the landscape of the society in which the company operates from (Jones, 2010).

This is based on the fact that companies activities have destroyed the environment especially the nature is polluted and climate changes are the results of the development in production of industries that aim at satisfaction of human needs and forget to take care of the environment. Thus, this requires that each member of the society including financial institutions to contribute towards the repair and maintenance of the environment so that the negative effects that may result from nature degradation may be managed and avoided. There should be external assessors and guarantors of environmental protection reporting in qualitative and quantitative form (Olayinka, 2012; Usman, Ojonemi & Ochala, 2013).

Manufacturing Companies Operational Efficiency

Operational efficiency has been considered as the ratio between the resources used and the outcomes or output from that use. Thus, the operational efficiency is achieved if there is positive changes in output to input relational ratio (Adegboyega & Taiwo, 2010). This explains that the production costs should be decreased without compromising the quantity and quality of the outcomes/products, thus, quality and quantity are to be increased or remained constant (Adegboyega & Taiwo, 2010; Oyesiku, Muyiwa & Duwole, 2016).

Olalere, Temitope, John and Oluwatobi (2015) posit that operational efficiency is the ability of producing goods or services. It is about how economic resources are used in the process of the achieving the organizational objective measured in terms of quantity and quality. This is about the productivity capacity and processes adopted in production of goods and services that satisfy markets' needs. This refers to the how of using labor (man), machine, material and money with the main objective of producing the demanded quantity by consumers without deteriorating the quality of products and services.

Operational efficiency as productivity tool has two ways of measurements (1) increase the output or reduce the input (simply meaning that the production should be increased with minimum use of production factorial resources); (2) increase in both input and output, but output should be increased faster than input; or when both input and output decreased, but input (used resources) decreased faster than output (Rabah, Ibrahim, Ijah & Manga, 2011). Operational efficiency again is the comparison of the value and quantity of economic resources or factors of production used in a specified projects towards the attainment of good or improved quantity and quality of outputs (Oyesiku, Muyiwa & Duwole, 2016; Edet & Oluwatoyin, 2006).

Manufacturing companies follow many processes and adopt production methods in order to produce what satisfy the consumers need. The production activities cannot be done without use of natural resources, energy, water among others. Manufacturing firms need progress, productivity, profitability and environmental management in their reason of being installed. These components of activities should be managed in a way that does not make them to conflict each other. The strategic manufacturing companies are those that improve environmental management and sustainability without compromising their profitability and productivity. (Graedel & Allenby, 2010).

Most of the successful manufacturing firms are those that conserve the energy without compromising the production process and quality and quantity of the needed and planned output, use water in efficient way, strategize the use of waste that comes as a result of production, increase the productivity level, proceed to recycling of packages, and all are done in cost-efficiency manner. All of these parameters feasibility requires the technological advancement and adoption within manufacturing processes that aims at minimizing the cost without reducing the quality of goods and services (Tien, Chung & Tsai, 2002).

Natural resources, water, energy and waste management are key component that determine the efficiency in manufacturing process. If they are not well managed they become important sources of manufacturing companies loss. Embracing technology based on knowledge management is the solution to cost reduction and environmental conservation is source of business sustainability which leads to long term efficiency and profitability. There should be product design where a product may have different types of raw materials which do not harm the environment and process which reduce cost of production, the production process should focus of processes that are zero emission, reduction of negative effects on living creatures, reuse and recycling of the waste (Chukwudi, Uchechukwu & Chinedu, 2016).

These can only be achieved is there is presence of capacity and companies' capabilities of preventing pollution and reuse of waste and requires being ecosystem friendly behaviors. The variety and availability of raw materials, production equipments are key factors that determine the cost efficiency in manufacturing companies. The reuse and recycle processes help to manage efficiently the cost of packaging in industrial processes and require the original cost of packages produce then no additional subsequent costs than transformational process which ignore cost of raw materials since the packages were already in existence (Hutchins, Gierke & Sutherland, 2010).

The investment in physical assets is of paramount importance is such a way that there modern plants and equipment help in increasing the level of production with needed quality, reduce costs of operations, save workforce energy and lead to regulations and policies compliance and such investment provides efficiency in utilization of energy, water, raw materials, natural resources and human resources use. The energy systems for manufacturing facilities have advanced to improve operating cost structures, including load curtailment and shedding, and energy monitoring, as well as control of generators, and thermal plants (Rosen & Kishawy, 2012).

Theoretical Review

This study is encored on stakeholders theory which states that companies have a range of people that they are in direct or indirect relationship with that have different needs of information about their interests in those entities. Each of these users of information from entities is affected by what it achieves in terms of profitability, survival, growth, environmental and social interests and even financial position of the entity in order to help them planning for the satisfaction of their needs (Freeman, 2003). The main purpose of the companies is to serve different parts of the partners who are all considered as stakeholders. This is beyond the financial interests seekers, the stakeholders' theory posits that firm's management should protect all stakeholders interests and they have moral and legal obligation in balancing the diverse partners' interests (Freeman, 1984). Thus, the existence, effectiveness, and sustainability of any company depends on with all inside and outside stakeholders who have different contribution and even expectations to and from it. The common ground of the contributors to the use of this theory, is that companies operations affect people and are affected by others and no company that operates in isolation (Parrot & Tierney, 2012; Simpson, Fischer & Rhode, 2013; Dawkins, 2014; Ratnatunga & Alam, 2011).

It is stakeholders' theory that explains the joint value creation as the main purpose of the company to all the stakeholders as part of ecosystems and social group. Thus, it a task of management to work hard in fluctuating the resources entrusted to them in order to generate profits that become basis of serving and paying all stakeholders interests for a long term. It is this regard that managers have to set in their minds and agendas that potential investments value, customers' value, banks and creditors value, shareholders value, employees value, governments value, community and environmental values are key factor that determines business effectiveness (Freeman, 2003). Thus, stakeholders' theory proponent and founder Freedman mentions that companies should consider all the people that work with them in one way or another, because all groups contribute to the vital to the sustainability, survival and effectiveness (Freeman, 2004). Ioana andAdriana (2013), Deegan (2013) and Samkin and Schneider (2010) are of the opinion that stakeholders theory explains the relationships that exist between companies, community, government and other regulatory bodies, emplyees and environment where they are established. It explains the companies' actions conduct in relationship with each partner's interest and effect of each other actions of their survival and continuity of existence.

Empirical review

Ezejiofor, Akamelu and Chigbo (2016) demonstrated that environmental sustainability is a key factor that leads to companies' efficiency in terms of operational costs saving and generating additional income through recycling of waste from production process. This study has recommended that government agencies in charge of environmental protection should enforce the environmental laws so as to reduce the manufacturing negative effects on the environment where companies are established regardless their area of establishment and manufacturing companies' managers should strictly follow environmental protection laws and policies for their sustainability than only looking for wealth maximization. It has shown that environmental protection is a key factor that improves operational efficiency of manufacturing companies that implement environmental protection policies and laws.

Bassey, Oba and Onyah (2013) studied the effect of environmental cost management and its impact on the production efficiency. This study has found that environmental management has significant effect on manufacturing companies efficiency. The study has found that the environmental sustainability is not sufficiently implemented in Nigeria oil and gas industry, as a result huge costs.

Hasan and Hakan (2012) found that environmental sustainability should be the focus of manufacturing companies, where companies have to be responsible for their operations during the production process and the effects they have on employees, supply chain effects, consumers of the goods, communities of establishment, local government facilities and general interests. This shows that once manufacturers are able to satisfy each and every part's interests they will automatically secure their business for a long time because the needs of their partners are satisfied. The study also demonstrated that once water, natural resources, climate, energy and other components of ecosystem are were managed by each partner there will be continuity of satisfaction of human needs.

Methodology

This study adopted the survey design and primary data was collected through the use of questionnaire where the management and staff provided answers to the questionnaire and the researcher used multiple regression statistics in testing the effect of environmental sustainability variables on operational efficiency. Convenience sampling technique was adopted to allow the researcher to use 25 respondents from each of the three multinational manufacturing firms and among which 75 targeted respondents 68 (87.18%) of copies of questionnaire were retrieved and judged useful in analysis. The data helped to get statistical evidence that supported the test of the hypothesis of the study which stipulated that "there is no significant effect of environmental sustainability on manufacturing operational efficiency in selected companies in Kigali".

Findings, Discussion and Interpretation

The findings are presented in three tables that help the examination of the effect of environmental sustainability variables (CSR, Employee Health and Safety, and Environmental protection) on manufacturing operational efficiency.

Table 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834[a]	.696	.682	.64241

a. Predictors: (Constant), CSR, Environmental protection, Employees' Health and Safety

Table 2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60.529	3	20.176	48.890	.000[b]
	Residual	26.412	64	.413		
	Total	86.941	67			

a. Dependent Variable: Operational efficiency

b. Predictors: (Constant), CSR, Environmental protection, Employees' Health and Safety

Table 3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.120	3.053		3.970	.000
	Employees' Health and Safety	.554	.058	.772	9.618	.000
	Environmental protection	-.160	.055	-.209	-2.913	.005
	CSR	.112	.051	.172	2.187	.032

a. Dependent Variable: Operational efficiency

The results from Table 1 show that the environmental sustainability variables have positive effect on manufacturing operational efficiency as a whole. This is explained by the Adjusted R-Square of .682 translated as 68.2% of changes in manufacturing operational efficiency comes from CSR, Environmental protection and employees health and safety, while

.318 translated as 31.8% of changes in manufacturing operational efficiency comes from other variables which are not included in the model. The results from Table 2 show that F-test is 48.890 with a significance level of .000. The results from Table 3 show that all the independent variables are the best predictors of manufacturing operational efficiency. However, employees health and safety is positively very significant factor at .000 level of significance, followed by CSR which also positively significant at .032 while environmental protections is negatively significant at .005 level of significance.

The analysis of these results is that multinational manufacturing companies in Rwanda invest too much in terms of employees health and safety inside their firms, this is justified by the fact that protecting employees is fundamental for ensuring that the quality of work will be improved and the products and service delivery will be enhanced since the staff are internally protected against any harmful and work accidents. The effect of this is that once the employees are protected, there will be no additional cost in medical treatment of accidents caused by manufacturing processes as the case of non protected firms (Hutchins, Gierke & Sutherland, 2010; Ezejiofor, Akamelu & Chigbo, 2016).

The surveyed multinational manufacturing companies in Rwanda contribute to the corporate social responsibility activities in their working environment. This shows that the communities in which these companies are implemented see the value created by these multinational manufacturing firms. There is contribution to their well-being as citizens of these firms. Therefore, contributing to the social needs of the community reduces the negative effects that the community would cause to the firms and thus, companies operations are enhanced, security ensured and sustainability of business is sure (Ekwueme, 2011; Bassey, Oba & Onyah, 2013).

Thus, there is lack of external environmental protection in the surveyed companies, this is manifested in the lack of effective strategies to reduce environmental pollution, waste of water and energy, lack of clean air among others variables which have negative effects on multinational manufacturing operational efficiency (Faboyede, 2011; Hasan & Hakan, 2012).

Conclusion and Recommendation

The environmental sustainability is a current issue in financial reporting which attracts the attention of scholars and political agendas from different level of administration. This is based on the fact that without sustainable environment there will be no future for the resources that would be used to produce goods and services that satisfy human needs. The study investigated that case of multinational manufacturing firms in Rwanda, and it has revealed that there is employment health and safety measures that have been taken, and involvement by manufacturing firms in the CSR. This is approved by the evidence from the study that employees are protected and social needs in the surrounding communities are addressed in terms of CSR by those firms. There has been a negative effect of environmental protection on manufacturing operational efficiencies. This shows that those firms still have a challenge in the environmental protection and is negatively causing payment of more costs in order to maintain external environment clear and clean.

This study recommended that multinational manufacturing firms should adopt environmental protection policies and strategies so that they overcome the external environmental aggression in terms of use of land, water, ecosystems, and management of waste because these may continue to cause huge costs on manufacturing operations in Rwanda.

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