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EFFECT OF ECOPRENEURSHIP ON ORGANIZATIONAL PERFORMANCE OF SELECTED MANUFACTURING FIRMS IN AFRICA EVIDENCE FROM NIGERIA

Ernest Jebolise Chukwuka (PhD)
Department of Business Administration, Michael and Cecilia Ibru University, Delta State, Nigeria
E-mail: ernestchukwuka48@gmail.com

Abstract

This study presents an empirical investigation of the effect of Ecopreneurship on organizational performance of selected manufacturing firms in Nigeria. This study was motivated by the need to solve the environmental problems caused by the activities of profit driven entrepreneurs as well as exploring the benefits to organizations. The study was guided by two key objectives, from which appropriate research questions and hypotheses were formulated. The specific objectives of this study were: (i) ascertain the extent to which ecological sustainability practices affect the profitability of selected manufacturing firms in Nigeria (ii) establish the degree to which eco-innovation affects market share of selected manufacturing firms in Nigeria. This study adopted the survey design. Simple random sampling technique was used in selecting the 10 manufacturing firms in Nigeria based on the rich ecopreneurship profiles and mode of operations of the manufacturing firms in Nigeria. A sample size of 543 respondents was determined from the population of 5705 drawn from management, middle and lower cadre of the selected manufacturing firms using Cochran (1977) statistical formula. A stratified sampling technique was also used to determine the proportional allocation of questionnaire to management cadre, middle cadre and lower cadre. Designed questionnaire and personal interview were used for primary data collection. The questionnaire was structured on 5-point Likert scale. The validity of the instrument was ascertained using content validity. The instrument was checked for Reliability using test re-test method through Cronbach alpha with a value of 0.90, which shows consistency in the items of survey. Data were analyzed and the hypotheses were tested using linear regression analysis. Probability level of significance was given at 5%. Data were presented using simple percentage. Findings revealed that Ecological sustainability had a positive and significant effect on the profitability of the selected manufacturing firms in Nigeria. Eco-innovation had a positive effect on the market share of selected manufacturing firms of south-south, Nigeria. In conclusion, the implementation of ecopreneurship practices, principles and processes will lead to very positive outcome that will be visibly manifested in the organization and the environment. The recommendations were ecopreneurship courses should be incorporated into the current entrepreneurship education curriculum. Governments should give incentives, subsidies to ecopreneurship firms by way of tax waivers and policy support.

Keywords: ecopreneurship, Eco-innovation, Ecological sustainability, Profitability, Market share, Performance, Manufacturing firms.

Introduction

Ecopreneurship is an amalgamation of two words, ecological (eco) and entrepreneurship which refers to entrepreneurship through an environmental lens (Schaltegger 2005). Ecopreneurship also refers to a process by which entrepreneurs

introduce eco-friendly or relatively more eco-friendly products and process into the market place (Pastakia, 1998). Ecopreneurship is characterized by some fundamental aspects of entrepreneurial activities that are oriented less towards technical procedures or management systems and focused more on the personal initiative and skills of the entrepreneurial person or team to release market success with environmental innovations (Pinchat, 1988). This wide definition of ecopreneurship takes entrepreneurs as an important subgroup of ecopreneurship into account, as entrepreneurs represent actors inside an organization who substantially change and shape the environmental and business growth development of an existing company (Pastakia, 2002). Companies and actors making environmental progress in their core business may be called ecopreneurs (Schaltegger, 2002). They generate new organisational modes, techniques, services and products that substantially reduce environmental impacts and increase the quality of life (Schaltegger, 2002). Schumpeter (1934) cited in Schaltegger (2002) referred to such entrepreneurial activities as 'Creative destruction'. "Ecopreneurs destroy existing conventional production methods, products, market structures and consumption patterns and replace them with superior environmental services and products. They prompt the creation of market dynamics of environmental progress" Schumpeter (1934).

Market systems have adversely affected the environment by failing to deal with negative environmental externalities and undervaluing natural resources, leading to their overexploitation and depletion. Governments have sought to address the problem through a mix of command and control and market-based instruments, with bounded success. One of the strongest alternatives for dealing with such market failures is ecopreneurship (Pastakia 2002).

Schaltegger (2002), also states that for a company to have a positive environmental influence, it must make a substantial and real contribution to environmental progress. A real improvement can be created only if the production process, services and products are superior environmentally. Ecopreneurs operate companies that meet up both requirements ideally; ecopreneurship pulls the whole market towards an environmental progress. Ecopreneurship has to do with carrying out activities that keep the environment clean as well as meeting the business objective (Schaper, 2002). The opportunities of ecopreneurship include developing a market and creating an environment for such products. The problems include financial barriers such as costs and complex regulations and policies acting as hindrance in the growth opportunity. The biggest problem for ecopreneurs is customer value creation through innovative products and cost control along with this consumer education on environment cleanliness (Schaltegger, 2005).

The relationship between business and the environment is not new. There was an upsurge of interest in environmental degradation during the 1960s in North America and Western Europe because of the incidents of heavy smog in London caused by business activities. At that time people became more aware of the negative environmental consequences of business activities. The business responds to the environmental concerns was antagonistic, with little care about the cost of business activities to the environment (Utting, 2000) cited in McEwen (2013). They saw the environmental concerns as a nuisance to their businesses and opposed any effort to control performance (Tillery, 1999).

However, McEwen (2013) maintains that ecopreneurship has undergone evolutional stages in history; from 1960 to 1970; there was a publication of Pioneering Article in Harvard Business Review suggesting the ecology movement could provide new markets for business (Quinn, 1971). There was also an increase of interest in Environmental Degradation and greater awareness of the Native Environmental impact of business activities. This stage also reveals the passage of environment-related legislation e.g. Clear Air Act etc. From 1980 to 1990, this stage experienced publication of articles arguing that innovative business solutions provide a basis for new business prospects and improve the environment (Elkington and Burke, 1998). From 1990 to 2000, this stage witnessed an introduction of terms such as environmental entrepreneur, green entrepreneur, eco-entrepreneur, ecopreneur (Benneth, 1991; Berlie, 1991; Blue, 1990). This stage witnessed a major focus by scholars on environmentally friendly innovations and stressing the profit potential of ecopreneurship (Isaac, 1998: Kyro 2001: Larson, 2000: Schaltegger and Wagner, 2011). There was also publication of special issues in the journal of organizational change management and Greener management International (Krueger, 1998; Schaper, 2002; Tillery and Parrish, 2009). There was incorporation of environmental and sustainability issues into some entrepreneurship texts (Kao, 2002; Kuratko and Hodgets, 200I). Schaper (2002) suggests the Integration of courses into the entrepreneurship curriculum and ecopreneurship units. This stage also witnessed the appointment of Endowed chair in sustainability Entrepreneurship in one European University (WRI, 2001 cited in Ndedi, 2011). There was also in this stage an introduction of micro-finance and other funding programs to provide start up and growth capital for green businesses as well as introduction of business incubators and advisory services to encourage ecoventures and sustainability entrepreneur (Ndedi, 2011; Schaper 2010).

Speth (2004) co-founder of the Natural Resources Defense Council (NRDC), founder of the world Resource Institute (WRI), and now the Dean of the school of forestry and environmental studies at Yale University identified the most serious threats to the environment in his book "Red Sky At Morning–America And The Global Crisis of Environment." Speth (2004) posits that the significance of concepts like ecopreneurship is necessary against the background of today's world's increasing environmental problems. Many of the most challenging environmental problems are either directly or indirectly caused by human activity which to a large part consists of business. These serious environmental challenges warrant a shift towards a more ecologically sustainable economy; a transition in which ecopreneurship may be helpful (Speth 2004).

Pastakia (1998) reveals that in the post-cold war era, there has been a growing reliance on market-led strategies for growth and development all over the world. The preference for markets continues to grow despite some of their well known limitation. One of the main breakdowns of the market system has been its inability to deal with the negative environmental externality generated at various stages of the production–consumption cycle-namely, during production, storage, transports, usage and disposal (Common, 1996). Also, imperfect market conditions, misplaced policies and unclear definition of property rights (Such as subsidies in different forms for abuse of natural resources) have often led to the undervaluation of natural resources and its unsustainable exploitation. These market breakdowns have resulted in irreparable damage to ecosystems and threatened to destroy life-support systems (Pastakia 2002).

Pastakia (2002), posits that with the growing awareness about the reasons of environmental externalities, business organisations in the late 20th century are now in the unenviable position of having to face pressure from employees, shareholders, consumers and the local communities. Also, the result of international protocols bans on hazardous services and products, and stricter governmental regulation against polluting process and products. The responses to these entities mounting pressures have been varied, while some relied on lobbying and good public relations techniques which would allow them a new charter of life to carry on with their business, as usual, a small minority chose to innovate to inculcate their environmental externalities. This latter group of firms through their pioneering efforts showed that the problem of environmental externalities was not entirely insurmountable (Kleiner 1991). Ottman (1998) reveals, "Environmental standards come in the form of a set of proceeding targets because they keep on revising them over time. Nevertheless, realising the futility of pursuing end-of-pipe solutions, many successful corporations have shifted their focus to minimising and even eliminating pollutants at the source. Most of the incremental innovations, often resulting from the establishment of environmental management system (EMSS) have led to considerable savings for such corporations. Whenever a polluting unit decides to clean up its act, it finds itself gradually moving up the ladder of cleaner production. Starting with better housekeeping, where the investment is close to nothing and the level of technical know-how needed is also minimal, the unit graduates into innovations for waste minimization and utilisation. The highest point of the ladder is reached when the company plans a complete change in either its process technology or its product designs making the business radically more eco-friendly than before". Meanwhile, industrial manufacturers have also been taking a few ecology lessons. The concepts of industrial symbiosis and industrial ecology have gained currency among industrial domains where the waste generated by each unit may be used as an input by another. Such a system makes firm possible to minimise the net externalities caused by the activities of an estate as a whole (Peck and Cote, 1998).

With increasing awareness of environmental crisis, such as ozone layer depletion, global warming, desertification and loss of biodiversity, the international community has endorsed a range of international agreements. These agreements are the Montreal Protocol, the Basal Convention and the Kyoto Protocol, which have played a significant role in pressuring industrialists worldwide to phase out harmful substances from their production processes (Caldwell, 1991).

Their impact on developing economies such as Nigeria has always come with these trends. On 18th October 1998, after the Jesse gas pipeline explosion tragedy in South-South Nigeria, this recorded more than 200 deaths as a result of the blast. The victims continue to suffer, and this reminds the country of the dangerous path to development which it adopted. The victims who have endured other less dramatic, though no less hazardous, environmental externalities have also spoken out and protested through various means leading to a much higher degree of general awareness. In Nigeria, the South–South region, and the impact of these negative environmental externalities are more devastating compared to any other region in Nigeria (Oteh and Eze, 2012).

The activities of oil companies and other manufacturing companies have polluted the water and the rivers which also serve as an irrigation channels to farms and also a source of drinking water to their host communities (Oteh and Eze, 2012).

Eckeson (2007) defines organisational performance as a series of organisational processes and applications designed to optimise the execution of business strategy. Organisational performance, therefore, is a process by which organisations monitor the accomplishment of given tasks measured against existing standards of accuracy, completeness, cost and speed aimed at achieving its set goals or objective. Aubrey (2006) describes performance management as a technology (i.e. science embedded in application methods) for managing both behaviours and results, two critical elements of what is known as performance. Organizational performance comprises the actual output or results of an organization as measured against its intended outputs or goals and objectives (Aubrey 2006).

Gbadamosi (1995) states that Organizational performance measures are as follows;

Productivity or Output**:** It remains one of the widely used criteria for determining organization and its coping ability. The criteria also emphasize the end. Critics also point out that this criterion reflects past effectiveness, while saying nothing about the present or future again while the productivity indices are being used, the current condition might have changed. Lastly, the quality and efficiency of production are played down.
Goal Attainment: This is complicated by the tendency of goals to change, to be vaguely stated or to exist in sets at different levels. Also, because there are multiple goals some will be in conflict. However, goals need to be evaluated before use since; for instance, it would be misleading to talk of effectiveness in attaining wrong or inadequate goals.
Profitability**:** this criterion is based mainly on accounting data. This is often affected by unanticipated fluctuation, external to system, such as markets, sales and prices. Morale, Turnover, Absenteeism: these criteria have been criticized as in consistent, insignificant and difficult to evaluated and interpret. Another problem is their differential sensitivity to additional factors, such as the nature and volume of work, organization levels and time of occurrence. Employee job Satisfaction**:** it is usually measured by a self-report questionnaire. It is obviously subjective. More important, however, is the fact that it does not necessary lead to organizational effectiveness or ineffectiveness. Market Share**;** this is a measure of organizational performance because it shows the extent of dominance of a firm's product to a target market. It shows the degree of acceptability of a firm's product by it consumers.

Richard (2009), believes that organizational performance encompasses three specific areas of firm outcomes which includes; Financial performance (profits, returns on asset, return on investment, etc.). Share holder return (total shareholder return lead to addition of economic value etc.)

Specialists in many fields are concerned with organisational performance including strategic planners, operations, and finance, organisational and legal development. In recent years many organisations have attempted to manage organisation performance using the balanced scorecard methodology where performance is measured and tracked in various dimensions like; Financial performance (e.g. returns for shareholder). Customer service and delight. Social Responsibility (E.g. community outreach, corporate citizenship). Employee stewardship.

However, giving the present environment problems facing the world, obviously past, strategies used to address and handle these challenges failed to stop environmental degradation. Therefore, it is time to look at and allow the role that entrepreneurs can play in solving our environmental problems.

Scholars accepted that entrepreneurs can help preserve our ecosystem counteract climate modify improve fresh water supply to reduce environmental degradation and deforestation and maintain biodiversity (Cohen and Winn, 2007; Dean and Mcmullen, 2007). Environmental degradation is mainly the most prominent global issue of the 21st century. Academic, policy makers, governments and non-governmental agencies are all concerned about the increasing levels of industrial toxins, deforestation, soil erosion and land degradation (Volery, 2002). Also, there are severe concerns about the negative consequences of the destruction of biodiversity, nuclear radiation, ozone layer depletion and climate change (Intergovernmental Panel on Climate Changes, (2007). United Nations environment program (World Resources Institute, 2004). The world resources institute's recent joint report, the World Bank and the United Nations show the diminishing capacity of five of earth most critical ecosystems. Environment degradation is a serious threat to the lives of people, plant and animals. It has not only led to natural disasters, such as droughts, heat waves, storm, etc. but it has also diminished the

sustainability and vitality of the economy. The long-term economic and financial impact of environmental degradation, therefore, may be very substantial because most of the world's economic output has to do with the sustainability of the natural system (Costanza, 2009).

Objectives of the Study

The aim of the study is to ascertain the effect of ecopreneurship on the performance of selected manufacturing firms in Nigeria. The specific objectives of the study are to:

1. Ascertain the extent to which ecological Sustainability practices affect the profitability of selected manufacturing firms in Nigeria.
2. Establish the degree to which eco-innovation affects market share of selected manufacturing firms in Nigeria.

Review of Related Literature

Conceptual Review of Ecopreneurship

Lambing and Kuehl (1997), posit that the word entrepreneur which ecopreneurship emerged from was derived from French which means the "initiative to bridge". An entrepreneur is an entity who brings together money, people, ideas and resources. All entrepreneurs deal with bridging activities between suppliers and customers to create and change markets, whereas ecopreneurship differ from conventional entrepreneurs in that, they also build bridges between environmental progress and market success, Lambing and Kuehl (1997). Ecopreneurship is a combination of two words ecological (eco) and entrepreneurship (Schattegger, 2002). Ecopreneurship can thus be roughly defined as entrepreneurship through an environmental lens (Schaltegger, 1998). Ecopreneurship is characterised by a given fundamental aspects of entrepreneurial activities that are oriented less towards management systems or technical procedure and focused more on the personal skills and initiative of the entrepreneurial team or person to realise market success with environmental innovations (Pinchat, 1988). Actors and companies making environmental progress in their core business may be called ecopreneurs (Schaltegger, 2002). They generate new techniques, products, services and organisational models that substantially reduce environmental impacts and increase the quality of life (Schaltegger, 2002). Schumpeter (1934) cited in Schaltegger (2002) referred to such entrepreneurial activities as 'Creative destruction'. "Ecopreneurs destroy existing conventional production methods, products, market structures and consumption patterns and replace them with superior environmental products and services. They create the market dynamics of environmental progress" Schumpeter (1934). The terms "ecopreneurship", sometimes refer to as "green entrepreneurship" (Schaper, 2002: Taylor and Waley, 2003), "ethical entrepreneurship" (Keogh and Polonsky, 1998) and "environmental entrepreneurship is a combination of two words ecological (eco) and entrepreneurship which entails the creation of an innovation company that supplies environmentally friendly products and services which denotes "entrepreneurship through environmental lens" (Schaltegger, 2005). Eco-entrepreneur enters these eco-friendly markets, not only to make profits but also because they have high, underlying, green values. They are the combination of high environmental and social values with energetic, entrepreneurial attitudes (Aderson, 1998; Gibbs, 2009). Volery (2002) defines ecopreneurship as environmental responsibility in entrepreneurship, while for Isaak (2002), it is an existential state of business behaviour committed to sustainability.

For the purpose of this study, ecopreneurship means an entrepreneurial action that contributes to preserving the natural environment (Pastakia, 1998; Schaper, 2005). Ecopreneurs are therefore entrepreneurs who found their business based on the principle of sustainability (Kirkwood and Walton, 2010). They are a new breed of eco-conscious change agents who are redesigning the way business is conducted and are introducing eco-friendly idea and innovations in the marketplace (Pastakia, 1998). Ecopreneurship is distinguished from social entrepreneurship which focuses on enhancing the social well-being of the society (Zahra, Gedajlovic, Neubaum, Shulman, 2009). Sustainability entrepreneurship integrates the three strand of the triple bottom line (Economies, social and environmental), (Tilley and Young 2009). Tilley and Young (2009) also urge that sustainability entrepreneurship explains further than "environmental" or "social entrepreneurship as it encompasses a more comprehensive range of the triple bottom line.

Schaltegger (2002) in his paper discussed the structure of measuring ecopreneurship. He states that there are five dimensions for measuring ecopreneurship. These are environmental goals and policies, the ecological range of products and services, market share, sales growth and the reaction of competitors. The major advantage of this framework is providing self-assessing and opportunities for improvement.

Schaper (2002) in his research on the "Essence of ecopreneurship" has touched on several aspects of environmental entrepreneurship. The researcher states that green entrepreneurship is a relatively new area but offers several opportunities for business sustainability through innovation. However, legislations, government regulation and industry support agencies have to play a significant role in making this actively successful. The NGOs venture capitalist and local communities can also play an important part to ensure the success of ecopreneurship.

Kainrath (2009) has mentioned that ecopreneurship has emerged from finding solutions to environmental problems across the globe. Hence ecopreneurship relates to environmentally friendly ways of doing business. Through several case studies, Kainrath (2009) concluded that there are three important elements to achieving success in ecopreneurship which he encapsulated in the concepts of ecopreneurship below.

Eco – Innovation

Rennings (2000), cited in Kainrath (2009) suggests that the distinctive feature of eco-innovation as compared to innovation in general is a concern about the direction and content of progress. In particular there have been concerns about whether innovation leads to the mitigation or resolution of an environmental problem. The "Innovation Impacts of Environmental Policy Instruments" - project introduced the term environmental innovation and defined it very broadly: "Eco-innovations are all measures of relevant actors (firms, politicians, unions, associations, churches, private households) which; develop new processes, products, behaviour and ideas, introduce or apply them, and which contribute to reducing the environmental burdens or to ecologically specified sustainability targets".

(Rennings, 2000) cited in Kainrath (2009) believe that one way of measuring the reduction in environmental impact achieved by an eco-innovation is by stating the so-called factor X reduction in resource use. The factor 4 and factor 10 concepts originate in the Wuppertal Institute and are promoted by Von Weizsäcker and others as creative ways to reduce the resource intensity of economic activity (Halila and Hörte, 2006). Factor reduction refers to the idea of reducing the resource use per unit of service or product by a certain factor and can be achieved through a combination of technological, financial and lifestyle changes. It is vital to point out here, that the idea behind factor X reduction is that the actual environmental effect of innovation rather than the intention behind the innovation determines if a change is environmental". Klimovaand Zlek, (2011), argues that ecopreneurship is also important because eco-innovations will be the future competitive advantage of companies and countries. They argue that if companies and countries want to be successful in the international market, they cannot rely on having low cost as their competitive advantage; but rather on new and innovative environmental technologies, services and process which will be the more important sources of competitive advantage. The long term sustainability of our economic system does not depend only on quantitative growth, but also on the ecological aspects of the growth and sustainable development (Klimova and Zitek, 2011). In addition, there are also some practical business reasons that justify the need for ecopreneurship to solve our environmental problems. First, our finite resources, for example fish, minerals or gas are limited in their supply. Once consumed, many of them cannot be recreated and we will be left with diminishing or no national resources, if we do not sustain them.

Also, because of economic activity and consumption, most of our resources become waste. As a result, we have the problem of pollution, which seriously affect humans and the ecosystem and lead to greenhouse gas accumulation and potential climate change (Volery, 200, p. 542). To sustain them, ecopreneurship is important to constantly look for alternatives, e.g. recycling or new sources of energy, such as wind, water, and solar (Arber and speech, 1992: Barnes, 1994). Second, the global population growth is also influencing ecopreneurship. The world population is expected to increase by 50% by 2050 and with it will come an increase in consumption (World Business Council for Sustainable Development 2002). Although part of thus consumption is important for relieving poverty in many emerging countries, most it will be done by affluent consumers, and can have negative impact on the ecosystems (Volery, 2002, p. 542). Ecopreneurship is therefore important to find the new technologies to protect the environment and to ensure that there are enough resources to fill the needs of both the current population and future generations (Volery, 20012).

Thirdly biodiversity loss also justified entrepreneurship action to solve environmental problems. Volery (2002), posit that "the rates of takeover of wild life habitat, and of species extinction are the fastest they have ever been in human history and are accelerating. Goodland (1991) also reported that the tropical forest, the world's richest species habitat has already been 55% destroyed and the loss in containing. Given the need for environment sustainability, there is need for a new kind of entrepreneur who will incorporate environmental concerns into the consideration of their bottom-line (Volerny 2002).

Ecological Sustainability

McEwen (2013) defines ecological sustainability as the capacity of the biosphere to meet the needs of the present generation, without depriving future generations from being able to meet their needs. This involves some practices that have to do with wise use of natural resources in short-term so that these resources are available in the long-term. Ecological sustainability relies on the fact that human economic and natural activities have the ability to deplete or exhaust natural resources, leaving nothing but polluted water and infertile soil for future generation. Ecological sustainability believe that all humans must employ moderate, wise and efficient use of resources in order to avoid over pollution and natural resource depletion or extinction. The ecological sustainability practices understudy includes; Planting and replanting of trees, moderate use of natural resources, the use of alternative source of energy e.g. wind, geothermal, solar, coal as a source of firms power generation and for commercial purpose (Schaper 2002).

Typologies of Ecopreneurs

Most researchers agree that there are two categories of environmental entrepreneurs. Entities with a profit or economic orientation and entities with the sustainability orientation want to help change or improve the environment (Talylor and Walley, 2003; Isaak, 2002; Koester, 2011). Schnick, Marxenand Freiman (2002) cited in McEwen (2013) refers to the ecological orientation continuum. From one angle are Ecopreneurs who continually adopt environmentally friendly practices and at the other angle are entrepreneurs who give no ecological consideration to the business at all. In other words; environmental entrepreneurs are either starting green business or making their businesses green (OECD, 2011).

The table 2.1 below presents the different types of Ecopreneurs related to each category.

Table 2.1: Typologies of Ecopreneurship

Reference	Types of Ecopreneurs
Volery, T. (2002)	**Environmental conscious** Develops innovation that either reduces resources and impact or improve cost efficiencies. **Green entrepreneurs** Aware of environmental issues and have their business in the environmental market place
Walley and Taylor (2002)	**Innovative opportunist** Financially oriented entrepreneur who Spots a green niche or business opportunity that happens to be green. **Ad hoc or accidental entrepreneur** Spots opportunities that are green, rather than seek out a niche in green spaces. **Visionary Entrepreneur** Built their business based on sustainability principles **Ethical maverick** Sets up alternative style business on the fringes of society
Linnanen (2002)	**Self employer** Advocates nature oriented enterprises e.g. wild life habitat preservation, eco tourism etc. Low desire to change the world and low financial drive. **Opportunist** Involved in environmental technology to help businesses and communities reduce environmental load on water, air and soil. They have a low desire to change the world and high financial drive. **Non –Profit business** Entrepreneur have high desire to change the world and low financial drive **Successful idealist** Entrepreneurs have high desire to change the world and high financial drive.
Isaak (2002)	**Green Business** Entrepreneurs did not start green business from scratch, but later discovered the advantages of greening their existing business. **Green –Green Business** Entrepreneurs designed business to be green in its products an process from scratch.
Schick, Marxen, Freiman (2002)	**ECO-dedicated** Consistently adopts environmentally friendly business practices **ECO –Open** Partially adopts environmentally friendly business practice. **ECO- reluctant** Adopts environmentally friendly business practices only when they are forced by regulations.
Schaltegger (2002)	**Alternative actors** Businesses exist to support alternative lifestyle e.g. types of counter culture **Bioneers** Inventors with strong RandD focus in high technology sectors e.g. alternative energy sources.

Source: McEwen (2013). Ecopreneurship as a solution to environmental problems: Implication for intention. *Journal of Academic Research and Social Sciences; Business Venturing*, 22(1),50-76

However, one criticism of ecopreneurship typologies is that they do not account for the changes that might occur among entrepreneurs, e.g. could Ecopreneurs move between different typologies and which drivers mainly guide their behaviour (DeBruin and Lewis, 2005 cited in Gibbs, 2007). In response, Isaak (1998) argues that the various types of Ecopreneurs are not pure forms, but represent reference points for broad change within businesses. The process theory of entrepreneurship support Isaak view point, which emphasizes the fact that you can't pin people down to one type, because entrepreneurs are always in the process of becoming.

Holger (2006) cited in McEwen (2013) mentions that ecopreneurship is about gaining a competitive advantage through entrepreneurial spirit and approach. The question is: what kind of competitive strategies do successful green entrepreneurs use and how they are able to combine environmental values with economic success. Isaak (2002) in his paper the author contracts green businesses with green-green business. The ideal type of ecopreneurs is defined as one who creates green business in order to radically transform the economic sector in which he or she operates. Similarity, ecopreneurship is seen as an existential from of business behaviour committed to sustainability. Some ideals type illustrations of ecopreneurship are given, including recent examples, having in common an accidental evolution into ecopreneurship that then becomes transformative for self, society and economic sector. The author provides some practical suggestions for business people who want to try an ecopreneurial strategy in private sector, including green brainstorming: cost reduction; the stimulation of innovation through green design and networking; and the attraction of interest of overwhelmed consumer in an emerging attentions economy through green marketing and through green start ups (green –green businesses) he suggest that, to promote ecopreneurship, governments and public official can run competitions for the most imaginative green business plans change tax regimes to promote resources conservation; build ecopreneurship into standard for public sector managers to meet; and target the creation of high technology development centuries to build serial ecopreneurship an to attract blended value venture capital.

Ecopreneurship opportunities, Dixon and Clifford (2007) in their paper have mentioned that ecopreneurship can help to create an economically viable business as well as retain core environmental and social values. The findings of the paper suggest a strong Link between entrepreneurialism and environmental. The entrepreneurial flair of the CEO enables the pursuit of environmental social and economic goals. The success of the green-works business model stems from the business symbiotic relationships. Firstly with large corporate bodies, which are keen to quantify their CSR efforts; secondly, with the community and social partners, who provide employment and training for disadvantage people and a route to relatively risk free growth; and thirdly, with government and social institutions, which provides special concession and support.

Hermann (2011) identified ecopreneurial opportunities in shipping industries. Trade and maritime transportation growth attracts a closer look into the shipping industrial environmental performance. The worldwide maritime sector adopts green shipping practices. Green shipping has spurred the demand for pollution control technology, cleaner fuels, and best management practices. Other industrial sectors adopt sustainability by the interrelation of technology push, regulation push, and market pull and business internal drivers. These drivers may creates a demand for eco-innovation which will help the industrial sector to fulfill its sustain ability requirement yet –green entrepreneurs role is an attention subject about the technological eco-innovations market introduction. This case study uses qualitative data to explore how the drivers of green shipping are creating incentives to ecopreneurship. The case study focuses on two maritime clean tech entrepreneurs as units of analysis overall, the case study found that regulations will induce cleaner technology adoption in the maritime industry. Meanwhile, the demand for cleaner technology is likely to create a business opportunity for new entrants (E.g. ecopreneurs). Information intermediaries are important players to inform potential entrepreneur about these opportunities.

McEwen (2013) identifies ecopreneurship as a solution to environmental problems. Given the present environmental problems facing the world it is clear that past strategies used to address these challenges have failed to prevent environmental degradation. It is therefore time to pay attention to the role that entrepreneurs can play in solving our environmental problems scholars agree that entrepreneurs can help preserve our ecosystem, counteract climate change, improve fresh water supply, maintain biodiversity and reduce environmental degradation and deforestation.

Table 2.2: Diminishing Capacity of Critical Global Ecosytems

Ecosystem	Diminishing capacity
Agriculture	40% of agricultural lands worldwide have been severely degraded through erosion, solemnization, nutrients depletion, biological degradation and pollution.
Costal	20% of fish and shellfish has been diminished due to over fishing destructive trawling technique
Ecosystem	Diminishing capacity and destruction of nursery habitat. • Pollution problems have plagued coastal lands because of use of synthetic chemicals fertilizers. • Global warming impacts ecosystem through rising see levels, warming of the ocean temperatures and changing storm frequency.
Forest	• More than 20% of global forest covered has been removed due to logging and conversion to other land uses. • Deforestation has significant impact on biodiversity, loss of unique plants and animal species.
Fresh water	Humans currently use more than 50% of all accessible fresh water; by 2025 demand will reach 70%.
Grassland	Road building, land conservation and human induced fires have caused significant loss of grassland and thus loss of biodiversity.

Source: World Resources Institution (2000) and Cohen and Winn, 34.

Framing Ecopreneurship

Contrary to other areas in business research the field of ecopreneurship research is relatively new (Schaper, 2002). It began, to develop as a field in the early 1990s when some authors began to examine the green entrepreneur. The environmental entrepreneur" and the eco-entrepreneur subsequently merged into ecopreneur" (Schaper, 2002).

Despite a small but growing body of literature on the subject, the field of ecopreneurship, because of its relative novelty, remains somewhat fragmented and some of its concepts remain unclear and with fuzzy definitions. Ecopreneurship remains under researched, especially lacking empirical studies of ecopreneurial companies. However, the overlap between sustainable and entrepreneurship constituting sustainopreneurship, also includes the sustainability goal of social equity or social sustainability, which deliberately excluded from the framing of ecopreneurship Ecopreneurship can therefore be seen as a separate concept, heretically on the same level with sustainopreneurship and not as a sub concept of it, (Schaper, 2002).

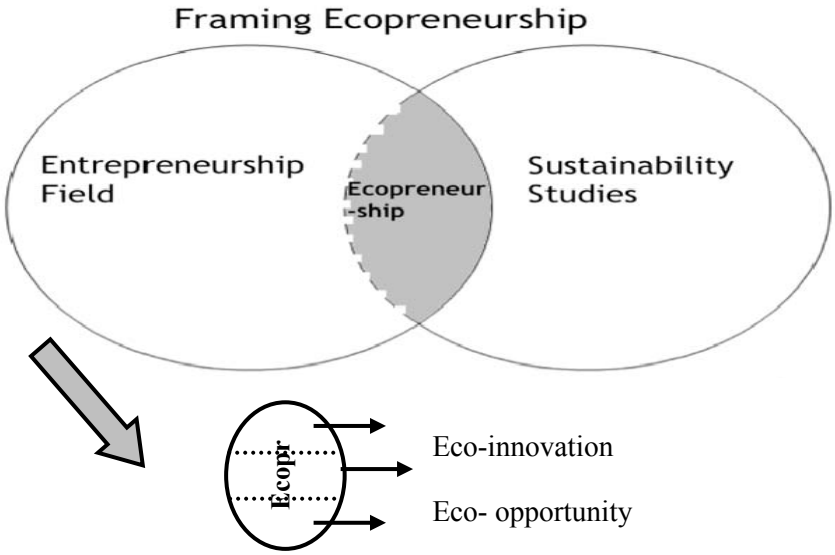

Fig. 2.1: Framing ecopreneurship in terms of the surrounding scientific fields.

Source: Kainrath, D. (2009). *Ecopreneurship in theory and practice; A proposed emerging framework for ecopreneurship*. (Bachelor's thesis), faculty of social science, Umea school of Business, Umea University, Sweden. Retrieved from http://umu.diva-portal. Org/smash/record.jsf?

This model is what the researcher called ECOMATRIX MODEL as part of his contribution to knowledge.

ECOMATRIX MODEL

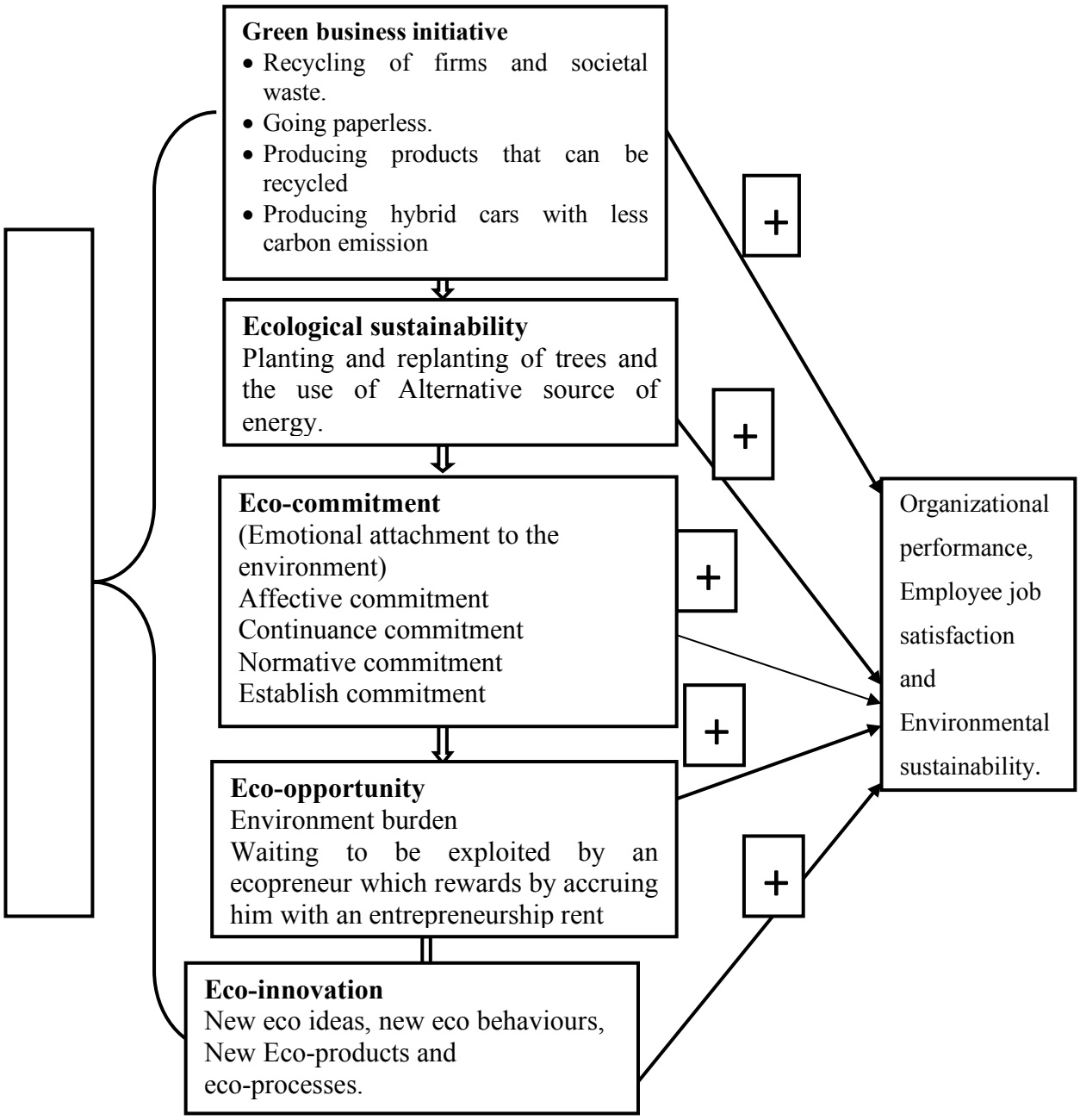

Fig 2.2: "Ecomatrix" Model for the Operation of Ecopreneurship Principles, Practices and Processes for Improved Organizational Performance and Environmental Sustainability.
Source: Researcher's Field Work, 2016

This model has five operational departments. These are green business initiative, ecological sustainability processes and practice, eco-commitment, eco-opportunity and eco- innovation. This model is highly needed for the ecopreneurship study which is still in infancy and there is paucity of research effort currently in the field of ecopreneurs. But the number of ecopreneurs keeps growing.

Ecomatrix model has been demystified by the researcher to the extent of listing all the steps involved in the five various departments of ecopreneurship. This is as follows:

1. **Green business initiative**: the process includes (a) Recycling of firms and societal waste. (b) Going paperless (c) producing products that can be recycled. (d) production of
   (e) Hybrid cars with less carbon emission
   .
2. **Ecological sustainability practices**
   (a) Planting and replanting of trees
   (b) moderate use of natural resources
   (c) The use of alternative source of energy e.g. wind, solar, geothermal, coal for firms power generation.

3. **Eco- commitment** (emotional attachment to the environment)

   (a) Affective commitment
   (b) Continuance commitment
   (c) Normative commitment
   (d) Establish commitment.

4. **Eco-opportunity**

   Environmental challenges waiting to be exploited by an ecopreneur which rewards by accruing him with an entrepreneurial rent. The process involves:

   (a)Discovering an environmental challenge or burden
   (b)Planning for the solution to the environmental burden.
   (c)Exploiting the opportunity
   (d)Entrepreneurial rent accrued payment.

5. **Eco- innovation**

   This involves invention of:

   - New eco- ideas
   - New Eco-behaviors
   - New eco- products
   - New eco- processes

Harnessing Innovation Potential of Ecopreneurs

McEwen (2013) highlights that given the growth of ecopreneurship, the question now is how we harness the innovation potential of ecopreneurs to exploit the opportunities within environmental degradation. In other words how do we foster the development of new entrepreneurial firms that will create the innovation necessary to solve environmental problems? Shane and Venkataraman (2000) cited in McEwen (2013) believe that"entrepreneurial action is created at the nexus of two phenomena the presence of enterprising individuals and the presence of lucrative opportunities. Ecopreneurs are the enterprising individual some are motivated by profit and start businesses that happen to be green, while others have a sustainability orientation and are motivated by environmental need. Their businesses are founded on the principle of sustainability and they seek to combine environmental awareness with conventional entrepreneurship (Schrick, et al, 2002) Lucrative entrepreneurial opportunities exist within the environmental degradation e.g. The problem of climate change, pollution, energy etc.

Shane (2003) reveals that the nexus is the place where the entrepreneur interacts with the environment e.g. environmental degradation, to identify opportunities. How they interact and whether opportunities recognition and exploitation takes place depends on the resources the entrepreneurs has at his or her disposal and the resources available in the environment. Given that the entrepreneur environment interaction is no critical to creating entrepreneurial action necessary for developing environment innovations.

Stimulation Strategies of Ecopreneurship

Provide high quality and reliable information to ecopreneurs

McEwen (2013) maintains that Lack of quality information is a major barrier to ecopreneurship. Because environmental innovations involves highly technical operations very little can be accomplished without reliable information about the nature and extent of the problem, the ranges of solution available the cost and how to minimize them (Bank and Heaton, 1995). Cohen and Levinthal (1990), establish that successful ecopreneur recognize opportunities that others do not see because they have better access to information about the existence of the opportunities.

Hermann (2011) also states that information availability and management help the entrepreneur or ecopreneur get closer to the opportunity i.e. where the market changes are and what is needed to access them. Clearly, the provision of reliable information directly to the potential business founders is a key factor in helping them make the decision t interest in an eco-innovation start up (Schrick, *et al.,* 2002).

Facilitate collaboration and networking among ecopreneur and innovation intermediaries

"An innovation intermediary is an organization or body, which acts as an agent or broker in any aspect of the innovation process between two or more parties (Howell, 2002). They help the ecopreneur acquired knowledge outside their own organizational boundaries (Clarke and Roome, 1999), and as such the ecopreneur gain access to an exchange relevant ecology and sustainability relates information. Some of the different type's intermediaries are government and local authorities, NGOs, universities, industry associations and consultants. Collaboration between ecopreneurs and innovation intermediaries also provide access to direct assistance, e.g., advice on funding sources advice on business operations, identification of potential collaborations, etc which supplement the ecopreneur resources and can lead to a startup involved with eco-innovation (Klewitz, Zeyen and Hansen (2012).

Refocus the publicly funded environmental technologies (research and development) first; attracting more private sector funds for environment technologies should be an important policy. In doing so, efforts should be made to reduce the risk for the private investors, while making sure that public money is used effective and does not crowd out private initiatives (Organization for Economic Cooperation and Development, 2008). Secondly publicly funded environmental technologies needs to be refocused. Presently, most of the funding are allocated to agencies that have very little to do with environmental technology (department of energy 44%, national Aeronautic and space association 23% and department of Defense 11%), while a small percentage is directed to technologies that improve the environment e.g. department of commerce 6.2% and the environmental protection agency 20% (Banks and Heaton 1995). According to an OECD report, over 100 billion dollars are spent annually to support and conduct R and D in twenty-two agencies, but six agencies control 95 percent of the funds (OECD, 2008). If we are serious about attracting the innovative potential of entrepreneurs to develop environmental technologies, we need to refocus publicly funded R and D. this could be done by including improved environmentally performance as a criterion for current R and D programs and also making environmentally relevant R and D a subcomponent of current programs (banks and Heaton 1995).

Increase the speed of commercialization of environmental technologies.

Many available environmental technologies have not been successfully introduced into the market because of market, infrastructure, production and consumption obstacles (OECD, 2009). One way to accelerate the commercialization of new technologies and the development of startups that will create clean technologies and green jobs is to establish a business incubator e.g., cleantech business incubator. The incubator will offer flexible ready to go office space lab facilities and a supportive environment where starting teams can share ideas with other entrepreneurs and fuel innovators

Increase access to financing

Availability of funding and other incentives are critical for environmental innovation. Access to funding is necessary to help ecopreneurs meet the cost of technical development and to win recognition of new products and services (Schick, et al 2002). Access to financing is extremely difficult for entrepreneurs in green innovation because of the immaturity of the market, the difficulty associated with accurately pricing the relative risk of the investment and the lack of history or track record of success. All of these make it more difficult for new entrants to innovation to obtain reasonable costs financing, than it is for established firms (OECD, 2011). To harness the innovative potential of the entrepreneurs for environmental technologies, there is need to improve access to financing through strengthening financial support with loan guarantees, grants, revolving loan funds, tax credits, etc developing relationships with the early stage investment community, and provide information on the various financial incentive, subsides, tax credits and grants available to encourage investments in environmental technologies (OECD, 2008, OECD (2011).

Improve access to markets

A strong demand for new products, process, and services is the most important driver and service is the most important driver of environment innovation. Strengthening demand could be done through regulatory policies that reward new technologies and greater use of economic incentives (banks and Heaton, 1995). Regulatory singles that are strong, predictable and clear will spur environmental innovation. It is essential that the regulations discriminate in favour of new technologies rater than prolong the status quo. For example, reducing the reliance on available technology as the measure by which pollution control standard are set and looking instead to improve future capabilities (banks and Heaton, 1995).

Establish clear policy on government procurement of green products

The biggest challenge green business face is going from research to production and distribution, and government can help companies make this transition successfully by procuring green products, government, at all levels, must play a more important, role in terms of purchasing green products. Through the introduction of sustainability criteria into public procurement decisions, the government can stimulate the development and use of more environmentally friendly technologies. The strategy should address responsibilities resources and monitoring and evaluation procedures. They key goal should be to develop standards and create momentum towards significantly increasing the amount of green products and services purchase by the government (Ambatchtsheer, Charest, Ksowsky, Mitschele, and Nielson, 2007).

Promote flexible labour market policies and support workers skills training programs

The transaction towards a low carbon economy requires workers with new competencies to exploit the potential of the new technologies. Labour markets and training polices can play a key role in facilitating the adjustment necessary for the transition to green growth (OECD, 2010). The government and economic development agencies should promote and support flexible labour market policies to facilitate the movement of workers and resources from declining to innovative firms and regions. Too much rigidity in labour market has been shown to reduce innovations (Cotis, Serres, and Duval, 2010). Having the right people is a driver for innovation but requires relevant education as well as the development of skills to complement the formal education (OECD, 2011).

Role of Entrepreneurship Education in Stimulating Ecopreneurship

How can we stimulate future ecopreneurship behaviour? Currently the eco-entrepreneurial capacity of our students is limited. Entrepreneurship education with a specific focus on sustainability, energy conservation and renewable energy is one of the mechanisms that can be used to stimulate future entrepreneurial behaviour in energy related "green" sectors (Fletcher, Knol, and Jamicki, 2012) Entrepreneurship education has the profound moral responsibility to increase students environmental awareness, knowledge and skills, and values needed to create a just and sustainable future (Cortese, 2003). The goal is to expose students to ecopreneurship and sustainability issues so that will know "how to operate on renewable energy and to climate the concept of waste by making every products a raw material or nutrient for another species or activity or return if into the cycle of nature" (McDonough and Braugart, 2002).

Integrating Ecopreneurship into Entrepreneurship Education

Entrepreneurship students are an important target group for the expansion of innovation and entrepreneurial activities in the field of sustainability. However, the entrepreneurial capacity of our students and the numbers of courses focusing on ecopreneurship and sustainability are still limited (Fletcher, Knol, and Jamick, 2012). In responses to the need for more courses in ecopreneurship and sustainability entrepreneurship, this section described integrating ecopreneurship into the entrepreneurship curriculum of both local and global issues awareness of future trends, acquisition environmental values and engagement in ecological or systems thinking. Sustain ability (2008) also identified additional skills sets needed by the sustainability students; the ability to seek new ways to address needs, the ability to identify new business models that support the resulting innovative products and services, ability to develop by in and to gain support of a senior champion. In addition, ecopreneurship knowledge and skills must help graduates understand the critical challenges of ecopreneurs, i.e. producing goods that can be distributed, consumed, and disposed of in a manner that does not affect the environmental quality of the lives of future generation. Above all, ecopreneurship programs need to graduate students who understand environmental entrepreneurship and who can apply sustainability framework to design new products, services, and process. Table 3 presents an outline of a foundation course that may be used to integrate ecopreneurship into the ecopreneurship curriculum. Bridges and Wilhelm (2008),insist that one of the challenging curriculum issues whether to have a course entirely devoted to ecopreneurship or to integrate ecopreneurship into current course offering. They argued that if the second option is chosen, there is still the question of whether to infuse sustainability into the various topics within a traditional course or to include it as a separate, stand-a-alone module within a course. The particular pedagogical approach selected, they suggested, will depend on the resources of the department and the university, faculty, interest and expertise, and student interest in the topic, among other factors. Regardless of approach that is selected "the curriculum must cause students to challenge common assumption.

Table 2.3: Suggested Content for Ecopreneurship Course

Meaning and importance of ecopreneurship	• **What is ecopreneurship, distinguish from social entrepreneurship, economic entrepreneurship and sustainability entrepreneurship** • **Principle of eco-design**
Environmental trends/ problem	• Environmental problems facing local and global communities and opportunities that arise from these problems. • Treads in consumption of different forms of energy to determine magnitude of environmental problems. • Identify and evaluate alternative sources of energy or ways to enhance energy efficiency.
Sustainability on corporations	• Review of sustainability practices in corporations • Evaluation corporate behaviours in the context of sustainability.
Ecopreneurship process and entrepreneurial opportunities	• Overview of entrepreneurial process. • Identifying opportunity derived from environmental trends and problems eg methods for cleans us of coal, alternative sources of energy (wind, solar, geothermal, etc.) • Evaluate entrepreneurial opportunity.
Funding	• Different sources of funding, e.g. venture capital, angels, entrepreneur teams etc. • Determining financing needs. • Financial incentive to encourage ecopreneurship
Risks and rewards	• Types of risk, e.g. technology, market, financial, strategic, etc • Measure and compare social, economic and environmental risks and rewards of the venture. • Short term risks and return vs. long term expected benefits • Evaluation of SE benefits of the venture.
Business planning	• Component of business plan • Purpose and uses of business plan • Evaluation of business plan • Pitching the plan to investors.

However, to ensure long term retention of the knowledge, skills and values, the curriculum will provide learning experiences for students to work on actual real-world problems facing their campus, community, government and industry.

McDonough and Braungart (2002) believe that the educational experience must be aligned with the principles of sustainability. It should help students to understand the ecological services that are critical for human existence and how to make the ecological and social footprint of human activity visible (chambers, Simmons, and Waikernegel, 2002; and Durning 1997).

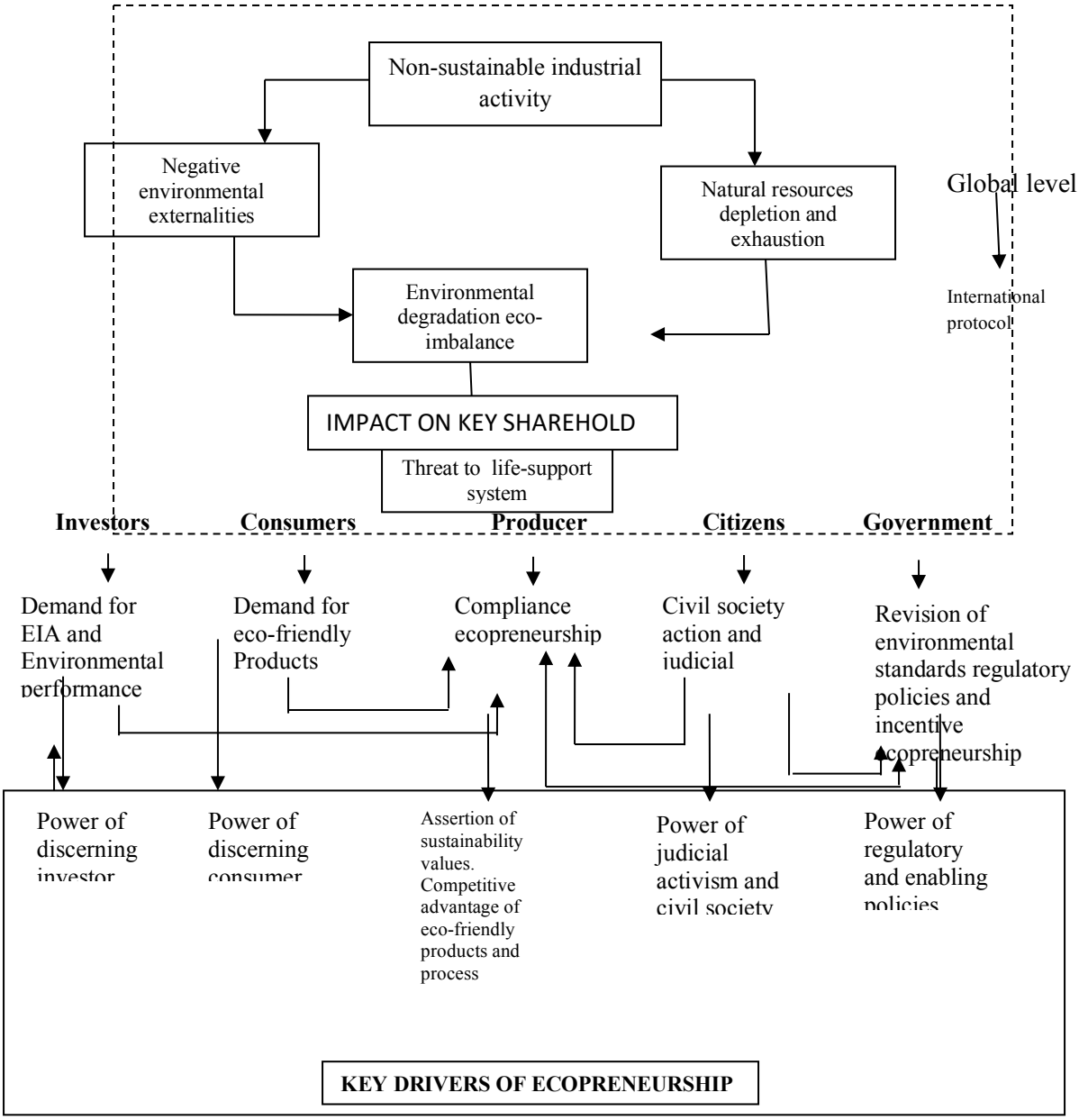

Fig. 2.3: Forces of change and key drivers of ecopreneurship

Source: Pastakia A. (2002). Assessing ecopreneurship in the context of developing country. *Greener Management International*, Summer, 38,93-106.

Ecopreneuship VS Sustainopreneurship Sustainopreneurship

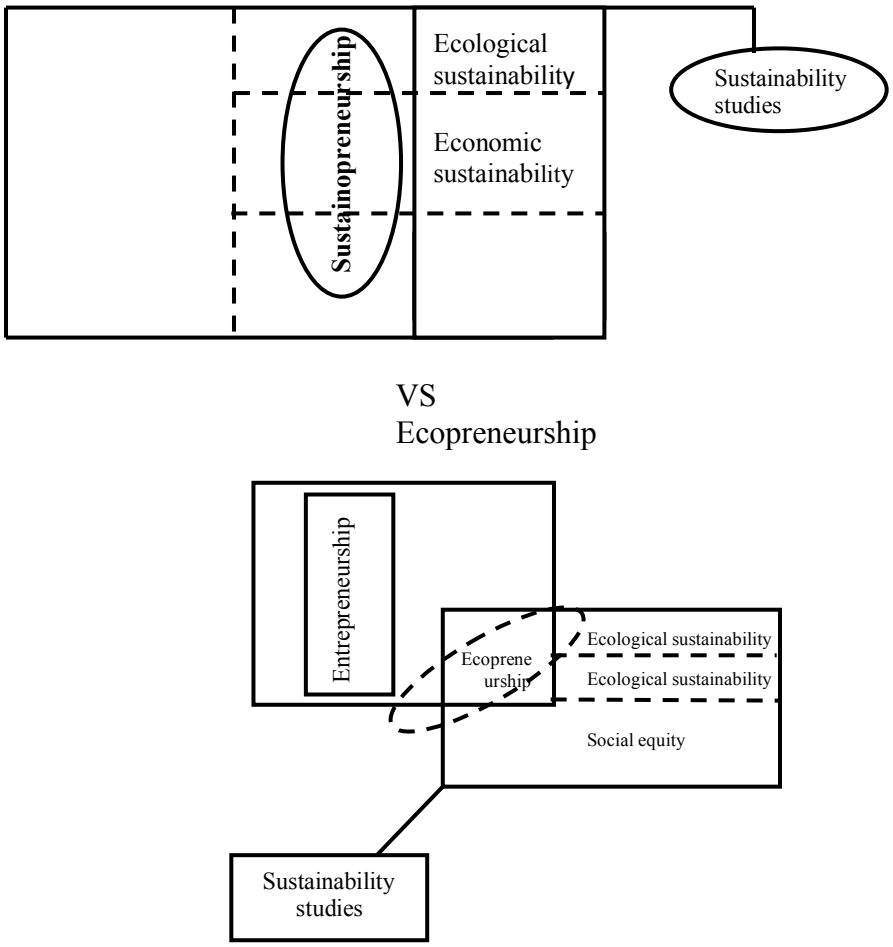

Fig. 2.4: The difference between ecopreneurship and sustainopreneurship

Source: Kainrath, D. (2009). *Ecopreneurship in theory and practice; A proposed emerging framework for ecopreneurship*. (Bachelor's thesis), faculty of social science, Umea school of Business, Umea University, Sweden. Retrieved from http://umu.diva-portal. Org/smash/record.jsf?

Organization

Manufacturing firms are considered as organization because it has the basic features of an organization as explained below. Various definitions have been attributed to organization, Cole (2002) cited in Brech (1965) as describing an organization as the frame work of the management process. Organization is further described as the process of organizing as implied in social equity formed as a social process emphasizes the function that people perform (what people do). Also process organization is one where hand-offs and authorization steps are reduced to minimum by organizing work around the process (Brumham, 2008). Organization therefore, can be used either as a social entity or as a process organizing process which involves setting up departments and job description (Ezigbo, 2007). For Cole (2004) organizations are systems of inter-dependent human beings. Organizations are set up to achieve purposes that individuals cannot achieve on their own. So organizations provide a means of working with others to achieve goals that are likely to be determined by whoever is in the best position to influence them. The key characteristic of organizations is their complexity (Cole 2004).

Argyris (1960) defines organizations as intricate human strategies designed to achieve certain objectives. Emphasis here is on strategies aimed at achieving stated objectives.

Organizational Performance

Organizations and their managers, express Cole (2004) are tended to be judged on their performance in terms of business outcomes such as turnover, profits, yields return in investment in terms of their agreed department/ unit objectives and in terms of how they have performed generally in carrying out their responsibilities as stated or implied in their job description. These are organizational performance variables. Organizations are assessed by or assess themselves to find out to what extent they have achieved their objectives. This process of determining the extent of organization's performance level can also be called organizational effectiveness in the literature of organizational theory (Onwuchekwa 1993). The relevance of organizational performance either in industry or market leadership is expressed in Eromaguru (2011:15) that in the modern word, the ultimate test for industry or market leadership is how well a company achieves a dramatic improvement in contemporary measure of organizational performance by product or service argumentation. The implication of this is that what is relevant in business transaction is the resultant outcome in terms of turnover, profit or return on investment.

Organizational Performance Measures

Gbadamosi (1995) states that Organizational performance or effectiveness is as follows;

a. **Productivity or Output:** It remains one of the widely used criteria for determining organization and its coping ability. The criteria also emphasize the end. Critics also point out that this criterion reflects past effectiveness, while saying nothing about the present or future again while the productivity indices are being used, the current condition might have changed. Lastly, the quality and efficiency of production are played down.
b. **Goal Attainment:** This is complicated by the tendency of goals to change, to be vaguely stated or to exist in sets at different levels.
   Also, because there are multiple goals some will be in conflict. However, goals need to be evaluated before use since; for instance, it would be misleading to talk of effectiveness in attaining wrong or inadequate goals.
c. **Profitability:** this criterion is based mainly on accounting data. This is often affected by unanticipated fluctuation, external to system, such as markets, sales and prices.
d. **Morale, Turnover, Absenteeism:** these criteria have been criticized as in consistent, insignificant and difficult to evaluated and interpret. Another problem is their differential sensitivity to additional factors, such as the nature and volume of work, organization levels and time of occurrence.
e. **Employee job Satisfaction:** it is usually measured by a self-report questionnaire. It is obviously subjective. More important, however, is the fact that it does not necessary lead to organizational effectiveness or ineffectiveness.
f. **Market Share;** This is a measure of organizational performance because it shows the extent of dominance of a firm's product to a target market. It shows the degree of acceptability of a firm's product by it consumers.

Theoretical Review

Ecological Modernization Theory

The proponent of Ecological Modernization theory also provides the rational theory for environmental entrepreneur (Hajer, 1995; Mol, 1995). According to the theory, it is possible to promote economic growth by giving higher priority to the environment. It is no longer necessary to trade off economic growth for environmental quality (Tillery and Young, 2009,). The capitalist system is seen as having the capacity to develop sustainable solutions to environmental problems. That capitalist drive for innovation can be harnessed to produce environmental improvements (Beveridge and Gug, 2005). Ecological modernization theorist believes that "the environmental problems facing the world today, act as a driving force for future industrial activity and economic development" (Murphy, 2000,). The theory calls for the progressive modernization theory sees it, entrepreneurs are the central agents of change in that process of transformation to avoid an ecological crisis (Gibbs, 2009: Mol and Spaargaren, 1993; Tillery and Young 2009). Entrepreneurial action therefore is the best solution to our environmental problems because this new generation of ecopreneur is seeking to combine environmental awareness and conventional entrepreneurial activity achieves entrepreneurial success. (Anderson, 1998). Ecopreneurs have the potential to be a major force in the overall transition towards a more sustainable business paradigm (Schaper, 2002).

The justification for using this theory is that ecological modernization theorist believes that "the environmental problems facing the world today, act as a driving force for future industrial activity and economic development" The theory also believe that it is possible to promote economic growth by giving higher priority to the environment. It is no longer necessary to trade off economic growth for environmental quality. This theory has served as a morale booster for ecopreneurs. This theory has given credence to the study of ecopreneurship.

Economic Theory of entrepreneurship and profit

Knight (1978), who was a professor of economics at the University of Chicago, sees an entrepreneur as an agent of economic change. He argued that changes either in the environment or organization are a transformation that can occur as a result of the reaction of some economic forces (business opportunities, resources etc) that result to change in environment in form of enterprise. Entrepreneurship was seen as a process or positive events to every economic revolution. Without entrepreneurs, the other factors of production such as land, labour and capital cannot transform themselves into economic value (product and services). Knight (1978) sees entrepreneurs as agents that bear risks and uncertainty.

Kirzner (1999) states that economic theorist see competition as a motivating factor for the acquisition of entrepreneurial skill. Women entrepreneurs are not exception from this economic perspective to entrepreneurial study. Women play a distinct role in the market system.

Knight (1978) believes that profit is the reward for uncertainly-bearing and not of risk-taking in a business. According to him there are two kinds of risk which entrepreneur has to bear. Some risks are of such a nature that they can be anticipated to a fair degree of accuracy, e.g. the risk of death, accident, etc. and so can be insured in return for premium. The entrepreneur can include the payment made in the form of premium in the total cost of production. So such risks which can be calculated and insured should not entitle the entrepreneur to a profit. On the other hand, there are some risks which are unpredictable and unforeseen and so they are non-insurable. For instance, if the demand for the product of entrepreneur suddenly comes down due to changes in fashions, tastes, etc. then he may not be able to cannot be statistically measured are called by Knight, as uncertainly-bearing risks. Profits, according to him are the reward of uncertainty-bearing rather than risk-taking which is insurable.

The critics of this theory believe that;

1. The total profit which an entrepreneur receives cannot be attributed solely to the element of uncertainty in a business. He performs other functions also such as coordinating, bargaining, and innovation in the business. So he must be paid for these services also.
2. It is not simply due to uncertainty-bearing that the supply of entrepreneur is restricted. There are other factors also which influence the supply of the entrepreneur for instance, etc. do restrict the supply of an entrepreneur in a business.

This theory was adopted for this study because the theory sees an entrepreneur as an agent of economic change as well as seeing entrepreneurial profit as reward of uncertainty-bearing rather than risk-taking which is insurable. This study is also an entrepreneurship study with a business interest on environmental sustainability which is called ecopreneurship. This theory of profit is also important to this study since the study determined the effect of ecological sustainability on the profitability of selected manufacturing firms. This theory believes that entrepreneurs are agents of economic change and that whatever change that occur in an environment or in organization is as a result of the coordination of economic forces.

Schumpeterian Theory

Schumpeterian theory provides the theoretical basis for environmental entrepreneurship. Schumpeter (1942) highlights that entrepreneurs are the innovators and as society's needs evolve the entrepreneur provides the innovation or "creative destruction" that gives society a new way of addressing problems. He argues that "environmental problem are inherently calls for innovation, as most of them are caused by the outdated applications of old, polluting and inefficient technology". Giving that the current solutions to our environmental problems are inadequate for sustainability, there is need for entrepreneurial action to develop something new, whether it is a production method, technological development product/services distribution system, or even a new organizational form (Lennoy and York, 2011, Tillery and Young,

2009). Schumpeterian theory is used in this study because it laid the foundation for ecopreneurship as a study. This theory provided the theoretical bases for environmental entrepreneurship and as such justifies the use in this study.

Methodology

This study adopted the descriptive survey design which allows for the collection of original data from the respondents, describes the present situation and problems in their natural setting and permits a sample representing the population to be drawn. This research design is considered most suitable for the study because it was well suited to the description and correlative nature of ecopreneurship study, the questionnaire and oral interview collected quantitative and qualitative data of 543 employees of ten manufacturing firms in Nigeria (Management cadre, middle cadre and lower cadre) with rich ecopreneurship profiles were randomly selected. Out of the 543 questionnaires distribute, 528 were returned valid and 15 questionnaires were discarded for incomplete information. The data collected were useful in measuring the ecopreneurship variables and testing the specified hypotheses of the study, most of the data generated from the questionnaire survey were ordinal in nature (responses were mainly ratings measured on the Likert scale).

Discussion and Result

A total of five hundred and forty three questionnaires were distributed to the randomly selected ecopreneurship profiled firms in Nigeria. A total of five hundred and twenty eight were returned completed. Fifteen copies were invalidated for incomplete information.

Table A. The Extent to Which Ecological Sustainability Practices of the selected manufacturing firms affects profitability

Statement for variables	SA	A	U	D	SD	Mean	St.d
Your firm is up to date with ecological sustainability practices and has adopted it in full scale	310(58.7)	120(22.7)	35(6.6)	23(4.4)	40(7.6)	4.2	.24
Ecological sustainability practices of your firm leads to increase in profitability	201(38.1)	302(57.2)	10(1.9)	5(0.9)	10(1.9)	4.3	.24
Ecological sustainability practice of your firm leads to high return on investment (ROI)	250(47.3)	190(35.9)	30(5.7)	8(1.5)	50(9.5)	4.1	.24
Sales turnover have positive effect on your firms profitability	189(35.8)	145(27.5)	105(19.8)	29(5.5)	60(11.4)	3.7	.26
Ecological sustainability regulations reduce environmental degradation and over use of natural resources.	158(29.9)	280(53.0)	10(1.9)	10(1.9)	70(13.3)	3.8	.26

Source: Field Survey, 2016.

Table A shows the participants responses towards the effect of ecological Sustainability Practices on profitability of the selected manufacturing firms. The result shows that 310(58.7%) of the participants strongly agreed that the firm is up to date with ecological sustainability practices and has adopted it in full scale while 120(22.7%) agreed and 35(6.6%) are undecided. Meanwhile 23(4.4%) and 40(7.63%) disagreed and strongly disagreed respectively. With the mean and Std 4.2 $\pm$ .24, it therefore implies that organization has adopted ecological sustainability practice in full scale.

Also the result of the study shows that 201(38.1%) of the participants strongly agreed Ecological sustainability practices leads to increase in profitability. About 302(57.2%) agreed and 10(1.9%) are undecided. Meanwhile, up to 5(0.9%) disagreed and 10(1.9%) disagreed. Going by the mean and Std of 4.3 $\pm$ .24, it means that the ecological sustainability practices of the firm leads to increase in profitability.

In addition, the result reveals that ecological sustainability practice of your firm leads to high return on investment (ROI) in your firm with the mean and Std (4.1 ± .24). This findings is due to 250(47.3%) who strongly agreed that ecological sustainability practice of your firm leads to high return on investment (ROI) 190(35.9%) agreed and 30(5.7%) are undecided. Only about 8(1.5%) and 50(9.5%) disagreed and strongly disagreed respectively. Subsequently the study indicate sales turnover have positive effect on the firms profitability with a mean and Std (3.7 ± .26). In view of this, 189(35.8%) strongly agreed that sales turnover have positive effect on the firms profitability and 145(27.5%) agreed while 105(19.8%) are undecided. Meanwhile 29(5.5%) disagreed and 60(11.4%) strongly disagreed. Similarly, the result of the study shows that 158(29.9%) participants strongly agreed that ecological sustainability regulations reduce environmental degradation and over use of natural resources. While 280(53.0%) agreed and 10(1.9%) are undecided. However, 10(1.9%) participants disagreed and 70(13.3%) strongly disagreed. Going by the result of the study, ecological sustainability regulations reduce environmental degradation and over use of natural resources (3.8 ± .26).

Table B. The degree to which Eco-innovation affect market share of the selected manufacturing firms

Statement of variables	SA	A	U	D	SD	Mean	St.d
Eco-innovative practice is implemented in full scale in your firm.	150(28.41)	265(50.2)	55(10.4%)	30(5.7)	28(5.3)	3.9	.25
Eco-innovativeness to a greater degree affects positively your firm's market share.	285(54.0)	192(36.3)	13(2.5)	20(3.79)	18(3.4)	4.3	.23
Management and workforce participation in eco-innovativeness has led to high degree of customer's loyalty to your firm's product.	180(43.1)	190(35.9)	50(9.5)	70(13.3)	38(7.2)	3.7	.26
Eco-innovation generates new ideas and process that's positively associated with customer's satisfaction.	306(58.0)	58(10.9)	34(6.4)	100(18.9)	30(5.7)	1.4	.74
Eco-innovation generates new technologies in product manufacturing.	188(35.6)	295(55.9)	10(1.89)	18(3.4)	13(2.5)	4.2	.24

Source: Field Survey, 2016

Table B shows the participants' responses towards the effect eco-innovation on market share of the selected manufacturing firms. The result shows that 150(28.41%) of the participants strongly agreed that Eco-innovative practice is implemented in full scale while 265(50.2%) agreed and 55(10.42%) are undecided. Meanwhile 30(5.7%) and 28(5.3%) disagreed and strongly disagreed respectively. With the mean and Std 3.9 ± .25, it therefore implies that in Eco-innovation practice is implemented in full scale.

Also the result of the study shows that 285(54.0%) of the participants strongly agreed Eco-innovativeness affects positively your firm's market share. About 192(36.3%) agreed and 13(2.5%) are undecided. Meanwhile, up to 20(3.79%) disagreed and 18(3.4%) disagreed. Going by the mean and Std of 4.3 ± .23, it means that the eco-innovation affects positively your firm's market share.

In addition, the result revealed that Management and workforce participation in eco-innovation has led to high degree of customer's loyalty to your firm's product with the mean and Std (3.7 ± .26). This findings is due to 180(43.1%) who strongly agreed that in view Management and workforce participation in eco-innovativeness has led to high degree of customer's loyalty to your firm's product and 190(35.9%) agreed, 50(9.5%) are undecided. Only about 70(13.3%) and 38(7.2%) disagreed and strongly disagreed respectively.

Subsequently the study indicate eco-innovativeness of firm generates new ideas and process that's positively associated with customer's satisfaction with a mean and Std (1.4 ± .74). In view of this, 306(58.0%) strongly agreed Eco-innovativeness of firm generates new ideas and process that's positively associated with customer's satisfaction and 58(10.9%) agreed while 34(6.4%) are undecided. Meanwhile 100(18.9%) disagreed and 30(5.7%) strongly disagreed.

Finally, the result of the study shows that 188(35.6%) participants strongly agreed that Eco-innovation generates new technologies in product manufacturing. While 295(55.9%) agreed and 10(1.89%) are undecided. However, 18(3.4%) participants disagreed and 13(2.5%) strongly disagreed. Going by the result of the study, the Eco-innovation generates new technologies in product manufacturing (4.2 ± .24).

Test of Hypotheses

Hypothesis One

H_I: Ecological sustainability has a significant and positive effect on profitability of selected manufacturing firms. Profitability model:

$P = f(B_o + B_1ES + B_2ST + B_3ROI + B_4ESP + B_5SE + B_6ED + e)$

Where:

P	=	Profitability
f	=	Function
$B_0 - B_6$	=	Constants
ST	=	Sales Turnover
ES	=	Ecological Sustainability
ROI	=	Return on Investment
ESP	=	Ecological Sustainability Project
SE	=	Sustainability Entrepreneurship
ED	=	Environmental Degradation
e	=	Error Margin

Table 4.12: Descriptive Statistics

	Mean	Std. Deviation	N
Ecological Sustainability	1.8704	1.08922	247
Profitability of Manufacturing Firms.	2.5668	1.39780	247

Source: SPSS version 17.0

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.809[a]	.655	.654	.64101	.602

a. Predictors: (Constant), Ecological Sustainability

b. Dependent Variable: Profitability of Manufacturing Firms Source;

Source: SPSS version 17.0

Table 4.14: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.252	.085		2.946	.004
	Ecological Sustainability.	.631	.029	.809	21.570	.000

Dependent Variable: Profitability of Manufacturing Firm.

Source: SPSS version 17.0

Result Summary

R = .809[a]
R^2 = .655
F = 465.286
T = 21.570
DW = .602

Interpretation

The descriptive statistic shows that ecological sustainability and profitability of manufacturing firms. Ecological sustainability has a mean of 1.87± 1.09 while the profitability of manufacturing firms a mean of 2.57± 1.40. This implies that that there is about the same variability of data points between the dependent and independent variables as there is no much difference in standard deviation values, in terms of the standard deviation scores.

R, the correlation coefficient with the value of .809, indicates that there is strong positive relationship between ecological sustainability and profitability of manufacturing firms. The R square, the coefficient of determination, shows that 65.5% of the variation in profitability of manufacturing firms can be explained by ecological sustainability. The remaining 34.5% is attributed to other factor. With the linear regression model, the error of estimate is low, with a value of about .64101. The Durbin Watson statistics of .602, which is not more than 2, indicates there is no autocorrelation. The regression sum of squares (191.185) is greater than the residual sum of squares (100.670), indicates that more of the variation in the dependent variable is explained by the model; hence variation explained that the model is not due to chance.

The value of F-statistics = 465.286 shows that the model ecological manufacturing profitability = .252 + .631 (sustainability {ES}) + e is significant. The extent to which ecological sustainability affects profitability of manufacturing firms with β = .756 value indicates a positive significance between ecological sustainability and profitability of manufacturing firms which is statistically significant (with t = 21.570) and p = .000 < 0.05. The significance value of (0.000) is less than 0.05, indicating that the model is significant.

The decision rule is to reject the null hypothesis if the probability value of (0.000) is less than the chosen 5% alpha level otherwise do not reject the null hypothesis Therefore, the null hypothesis is rejected and the alternate hypothesis is therefore accepted that Ecological sustainability has a significant and positive effect on profitability of selected manufacturing firms

Hypothesis Two

H_i: Eco–Innovation has a positive and significant effect on market share of selected manufacturing firms

Table 4.15: Descriptive Statistics

	Mean	Std. Deviation	N
Eco–Innovation	2.1794	1.42308	528
Market share of Manufacturing Firms	2.5840	1.44325	528

Table 4.16: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.874[a]	.764	.763	.69265	.369

a. Predictors: (Constant), Eco–Innovation

Table 4.17: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.048	.088		.542	.588
	Eco–Innovation	.862	.030	.874	29.012	.000

a. Dependent Variable: Market share of Manufacturing Firms

Source: SPSS version 17.0

Result Summary

R = .874[a]
R^2 = .764
F = 841.711
T = 29.012
DW = .369

Interpretation

The descriptive statistics of the eco–innovation with a mean response of 2.18 $\pm$ 1.42 and market share of manufacturing firms with a mean response of 2.58 $\pm$ 1.44. This implies that that there is about the same variability of data points between the dependent and independent variables as there is no much difference in standard deviation values, in terms of the standard deviation scores.

R, the correlation coefficient with the value of .874, indicates that there is strong positive relationship between eco–innovation and market share of manufacturing firms. The R square, the coefficient of determination, shows that 76.4% of the variation in market share of manufacturing firms can be explained by eco–innovation. The remaining 23.6% is attributed to other factor. With the linear regression model, the error of estimate is low, with a value of about .69265. The Durbin Watson statistics of .369, which is not more than 2, indicates there is no autocorrelation. The regression sum of squares (403.828) is greater than the residual sum of squares (124.740), which indicates that more of the variation in the dependent variable is explained by the model; hence variation explained that the model is not due to chance.

The value of F-statistics = 841.711 shows that the model MS = .048 + .862(Eco-innovation) + e is significant. The extent to which eco–innovation affects market share of manufacturing firms with β = .874 value indicates a positive significance between eco–innovation and market share of manufacturing firms which is statistically significant (with t = 29.012) and p = .000 < 0.05. The significance value of (0.000) is less than 0.05, indicating that the model is significant.

The decision rule is to reject the null hypothesis if the probability value of (0.000) is less than the chosen 5% alpha level otherwise do not reject the null hypothesis Therefore, the null hypothesis is rejected and the alternate hypothesis is therefore accepted that Eco–Innovation has a positive and significant effect on market share of selected manufacturing firms.

Discussion of Findings

In addition, the result of the study reviewed that ecological sustainability has a significant and positive effect on the profitability of selected manufacturing firms ($r = .809^{a;}$ F = 465.286; T = 21.570; p - .000). The result has confirmed the strong positive relationship or effect between ecological sustainability of selected manufacturing firm and profitability. This finding is also in agreement with Russo and Fouts (2014), they confirmed from their study that environmental sustainability and profitability are positively linked and that industry growth moderates the relationship.

Furthermore, the study indicates eco–innovation has a significant and positive effect on market share of selected manufacturing firms ($r = .874^{a;}$ F = 841.711; T = 29.012; p - .000). The finding of the above result has confirmed the relationship as revealed by the field survey, that eco-innovation has a significant and positive effect on market share of selected manufacturing firms. This finding agreed with the finding of Lin and Geng (2013), which investigation on the effect of market demand, green product, eco-innovation on firms performance show that market demands is positively correlated to firm performance. They also confirmed that green product innovation and performance is also positively correlated to firm performance.

Conclusion

The study concluded that ecological sustainability practices significantly and positively affect the selected manufacturing firm's profitability, Nigeria. This means that firms that reduce the environmental impact of its business operations will be more productive than others. This also means that ecological sustainability practices have a significant and positive effect on manufacturing firm's profitability. This implies that manufacturing firms that practices ecological sustainability practices will have nothing to lose but rather have a lot to gain.
It was further concluded that eco-innovation, positively and significantly affects the, market share.
Finally, the implementation of ecopreneurship practices, principles and processes will lead to very positive outcome that will be visibly manifested in the organization and the environment.

Recommendations

The under- listed recommendations were made based on the findings of this study:

i. The literature review and these research findings have found ecopreneurship as the most potent alternative for dealing with environmental challenges or market failures as well as dealing with all performance problems of manufacturing firms. Therefore Government should marshal out relevant tax wavers, incentives, subsidies, or grant for manufacturing firms that are going green or already practicing green business initiative. This will be a great way of encouraging ecopreneurship in South-south Nigeria.
ii. Government present way of dealing with environmental problems through some sought of mix of command and control and market based instruments should be reviewed and ecopreneurship principles, processes and practices encouraged for ecological sustainability and performance enhancement of firms.
iii. Ecopreneurship course should be incorporated into the current entrepreneurial education curriculum of Nigerian schools system to expose student entrepreneurs with ecological sustainability values. A model of how to do this will be created by the researcher as part of his contribution to knowledge.

Suggestions for Further Studies

The following topics have been suggested for investigation for further studies on entrepreneurship.

- Harnessing the entrepreneurial potentials of eco-opportunity in Nigeria.
- Ecopreneurship risks and rewards, an appraisal.
- Ecological sustainability in corporations, an empirical study.

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