# Entrepreneurship Education and Eco-Preneurship Innovation as Change Agents for Environmental Problems

Rahab. Karari

Machakos University

rkarari@mksu.ac.ke

Margret Munyua

Machakos University

munyuanyambura@gmail.com

#### **ABSTRACT**

Ecopreneurship means carrying out activities that keep the environment clean as well as meeting the business objectives. Given the current environmental problems facing the world, it is flawless that past strategies used to address the challenges have continually failed to prevent environmental degradation. Entrepreneurship is expected to be the next big thing to influence as the country struggles to achieve a balance between a growing GDP, inclusive growth and addressing issues ranging from education, energy efficiency to climate change. This paper attempts to examine the different dimensions of eco-preneurship. It also emphases on how to harness the innovative potential of mindful environmental entrepreneurs (eco-preneurs) to encourage more start—upsthat would produce the environmental technologies needed to address the environmental problems. It also discusses the role of entrepreneurship education in promoting eco-preneurship behavior, presents and outline for possible course that would be integrated into university entrepreneurship education.

**Keywords**: Environmental problems, Entrepreneurship degradation, Entrepreneurship education, Eco-preneurship

## INTRODUCTION.

The twenty-first century has witnessed numerous environmental problems such as land dilapidation, ever-increasing pollution level, trouncing of biodiversity and climate change which still remain unresolved. These environmental problems, to a large extent, have been traced to human entrepreneurial activity that triggered a continual increase in consumption of environmental resources and an alteration to the natural composition of the environment (Cohen and Winn, 2007; McEwen, 2013). This state of affairs has many explanations but some authors linked it to Schumpeter (1934), who contended that the innovations made by entrepreneurs are the major drivers of economic development and the fundamental factors in trade formation. The neo-Malthusian environmentalists, for example, supported Schumpeter's view but argued that over the past decades economic growth through entrepreneurial activity had not been going hand in hand with the preservation of the eco-system (Kate, Parris and Leiserowitz, 2005; Morelli, 2011). Thus, proponents of the neo-Malthusian ideology suggested that entrepreneurs as agents of "creative destruction" – as Schumpeter lyrically refers to them – could also be agents of a "creative solution" to address global environmental problems by introducing environmentally acceptable ideas, products and services (Dean and McMullen, 2007; York and Venkataraman, 2010). One such

environmental approach to economic activity is through "ecopreneurship" and "green product initiatives". This paper is driven by the truth that long-term sustainability of the economic system does not depend only on measurable growth, but also on ecological aspects of sustainable development goals (York and Venkataraman, 2010). It is an important paper given the need for ecopreneurship to solve contemporary environmental problems through the adoption and application of eco-friendly innovations in Kenya and other countries in the world.

Looking at the current environmental problems facing the world, it is obvious that past strategies used to tackle these challenges have failed to thwart environmental degradation. It is therefore time to give attention to the responsibility that entrepreneurs can take part in solving these nag ing environmental problems. (Cohen and Winn, Dean and McMullen, 2007). This paper focuses on how to harness the innovative potential of environmentally conscious entrepreneurs, called ecopreneurs, to encourage more startups that would create the environmental technologies needed to address our environmental problems. It also discussed the role of entrepreneurship education in promoting ecopreneurial behavior and presented an outline for a possible ecopreneurship course that could be integrated into University entrepreneurship education

Environmental degradation is perhaps the most prominent global issue of the 21st century. Academics, policymakers, nongovernmental agencies and governments are all concerned about the increasing levels of land degradation, soil erosion, deforestation, and industrial toxins (Volery, 2002; McEwen 2013) In addition, there are very serious concerns about the negative consequences of ozone depletion, climate change, nuclear radiation, and the destruction of biodiversity (Intergovernmental Panel on Climate Change (IPCC), 2007; United Nations Environment Program (UNEP), 2004, World Resources Institute, 2004). A recent joint report by the World Resources Institute, the World Bank, and the United Nations show the diminishing capacity of five of earth's most critical ecosystems. 40% of agricultural lands worldwide have been severely degraded through erosion, salinization, nutrient depletion, biological degradation, and pollution. 20% of fish and shellfish has been diminished due to overfishing, destructive, Costal trawling techniques, and destruction of nursery habitat. Pollution problems have plagued coastal lands because of use of synthetic chemicals and fertilizers. Global warming impacts ecosystem through rising sea levels, warming of the ocean temperatures and changing storm frequency. More than 20% of global forest cover has been removed due to logging and Forest conversion to other land uses. Deforestation has significant impact on biodiversity, e.g., loss of unique plant and animal species.

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. (Cohen and Winn, 2007; McEwen. T, 2013). "Environmental degradation has not only brought natural disasters, such as storms, heat waves, droughts, etc., but it has also diminished the vitality and sustainability of the economy. The long term economic and financial impact of environmental degradation, therefore, may be very substantial because a large amount of the world's economic output depends on the sustainability of the natural systems. The long term economic and financial impact of environmental degradation, therefore, may be very substantial because a large amount of the world's economic output depends on the sustainability of the natural systems (Costanza, et al, Kainrath, 2009).

According to the International Panel on Climate Change (2007) and the United Nations (2005), economic development is one of the main causes of environmental degradation in the economy. It is not surprising that "business and industry are often viewed as one of the largest contributors to environmental degradation" (Cohen & Winn, 2007, p. 29). Volery (2002) noted that for the past decade economic growth was done without considering the protection of the environment. Traditionally, efforts to address this problem have focused on how and why existing firms can become greener (Cohen & Winn, 2007; York & Venkataraman, 2010). According to York and Venkataraman (2010) these efforts have not led to solving our environmental problems. Entrepreneurs have contributed to solving environmental problems by creating new, more environmentally sustainable products and services (York & Venkataraman, 2010).

## Purpose

The purpose of this paper is to contribute to the discussion that proposes entrepreneurship as a solution to the environmental problem. Another principal reason for this paper is that finite resources, such as fish, minerals or gas, are limited in their supply and once consumed, many of them cannot be recreated and we will be left with shrinking or no natural resources if we do not sustain them (Volery 2002). Hence, this paper has revealed how economic activity (entrepreneurship) and consumption of natural resources can operate in a sustainable manner. In addition, this paper supports the argument that there is a need to constantly look for alternatives, e.g. recycling or new sources of energy generated from wind or solar energy in order to integrate environmental concerns into business activity. The focus here is on how to harness the innovative potential of ecopreneurs to take advantage of the entrepreneurial opportunities within environmental degradation and to explain the role of entrepreneurship education in environmental sustainability. According to Cohen and Winn (2007), "ecopreneurs have the potential to resolve our environmental problems and to gradually improve the earth's ecosystem,"

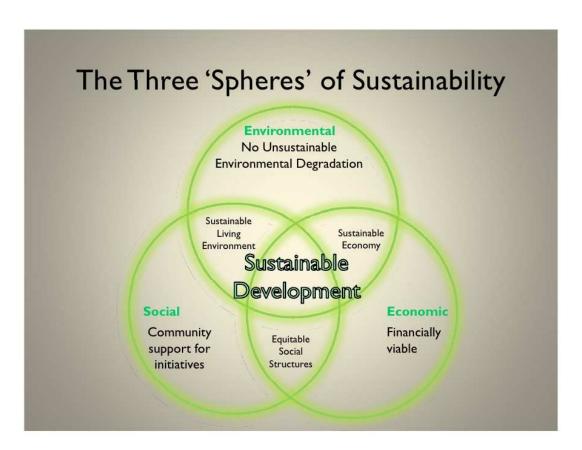
## Meaning of Ecopreneurship

The term "ecopreneurship: sometimes referred to as "green entrepreneurship" (Schaper, 2002; Taylor & Walley, 2003) "enviropreneurship" (Keogh & Polonsky, 1998) and "environmental entrepreneurship" is a combination of two words 'ecological (eco) and entrepreneurship which implies the creation of an innovative company that supplies environmentally friendly products and services i.e., "entrepreneurship through environmental lens" (Schaltegger, 2005). Eco-entrepreneurs enter these eco-friendly markets, not only to make profits, but also because they have strong, underlying, green values. They are the combination of strong environmental and social values with an energetic entrepreneurial attitude (Anderson, 1998; Gibbs, 2009). Volery (2002) defined ecopreneurship as environmental responsibility in entrepreneurship, while for Isaak (2005), it is an "existential form of business behavior committed to sustainability".

Ecopreneurs are therefore entrepreneurs who found their businesses based on the principle of sustainability (Kirkwood and Walton, 2010). They are a new breed of eco-conscious change agents

who are redefining the way business is conducted and are introducing eco-friendly ideas and innovations in the marketplace. Ecopreneurship is distinguished from social entrepreneurship which focuses on enhancing the social wellbeing of the society (Zahra, Gedajlovic, Neubaum, Shulman, 2009). Ecopreneurship is also different from sustainability entrepreneurship which integrates the three strands of the triple bottom line (economic, social and environmental). Tilley and Young (2009) argues that sustainability entrepreneurship goes further than "environmental" or "social" entrepreneurship as it encompasses a more comprehensive range of the triple bottom line. In other words Ecopreneurship is entrepreneurial activities through the environment lenses.

# Spheres of Ecopreneurship



The next section discussed the theoretical rationale, and the evolution and growth of ecopreneurship. It then examined how to harness the innovative potential of ecopreneurs to develop the environmental technologies needed to solve the environmental problems. And, finally, the paper discussed the role of entrepreneurship education in promoting ecopreneurship and suggested an outline for a possible foundation course in ecopreneurship. The paper contributes to the literature by adding to our theoretical understanding of how entrepreneurial action can help solve environmental problems, and by emphasizing the important role of entrepreneurship

education in developing the current and potential ecopreneurs. The overarching purpose of the paper is to provide insights for policymakers and educators into ways to foster ecopreneurship.

# Types of Ecopreneurs

**Environmental Conscious** 

- They develop innovations that either reduce resource and impact or improve cost efficiencies. Green Entrepreneurs
- They are aware of environmental issues and have their businesses in the environmental marketplace.

**Innovative Opportunist** 

• They are financially oriented entrepreneur who spots a green niche or business opportunity that happens to be green

Ad hoc or accidental entrepreneur

- They spots opportunities that are green, rather than seek out a niche in green spaces Visionary Entrepreneur
- They built their businesses based on sustainability principles Self-Employed
- They advocate nature-oriented enterprises e.g. wild life habitat preservation, eco-tourism etc; low desire to change the world and low financial drive

Opportunist

• They involve themselves 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

- They entrepreneurs have high desire to change the world and low financial drive Successful Idealist
- These are the entrepreneurs who have a high desire to change the world and high financial drive Green Business
- These are the entrepreneur who do not start green business from scratch, but later discover the advantages of greening their existing businesses

Green-Green Business

• These are the entrepreneurs who designs a business to be green in its products and processes from the scratch

Eco-dedicated

- These are the entrepreneurs who consistently adopt environmentally friendly business practices Eco-open
- These are the entrepreneurs who partially adopts environmentally friendly business

## Theoretical Framework

The report is based on two theories named; Schumpeterian and Ecological Modernization Theories Schumpeterian theory

This theory provides the theoretical foundation for environmental entrepreneurship. Given 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/service distribution system, or even a new organizational form. (Lennox & York, 2011, p. 9; Tillery & Young, 2009).

# Ecological ModernizationTheory

This theory is a school of thought that can be found in social science. It argues that an economy benefits when there is a move toward environmentalism. It is a unique theory within the scope of "Green Politics" as it is both a policy strategy and an analytical approach to having a discourse on environmental awareness. It is increasingly used in environmental policy analysis (Spaargaren, 2009, Howes, 2010) because it provides an appropriate framework to explore the roles of actors in society in the process towards achieving best practice environmental outcomes.

According to the Ecological modernization theorists, "the environmental problems facing the world today, act as a driving force for future industrial activity and economic development" as Joseph Huber (Mol, 1995) the father of this theory sees it, entrepreneurs are the central agents of change in that process of transformation to avoid an ecological crisis (Gibbs, 2009; Tillery & Young, 2009). Entrepreneurial action consequently is the best solution to our environmental problems because this new generation of ecopreneurs is seeking to combine environmental awareness and conventional entrepreneurial activity to achieve entrepreneurial success. Ecopreneurs have the potential to be a major force in the overall transition towards a more sustainable business paradigm. Ecopreneurship is also important because eco-innovations will be the future competitive advantage of companies and countries (Klimova & Zlek, 2011). They argued 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 processes which will be the more significant sources of competitive advantage. There are some practical business reasons that give good reason for the need for ecopreneurship to solve our environmental problems. First, our restricted 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 natural resources if we do not sustain them. Also due to economic activity and consumption, most of our resources become waste which results to major problem of pollution. These problems seriously affect humans and the ecosystem and could lead to greenhouse gas accumulation and potential climate change (Volery, 2002,). To maintain them, first ecopreneurship is constantly looking for alternatives, e.g. recycling or new sources of energy, such as wind, water, and solar. Second, the global population growth is also influencing ecopreneurship. Ecopreneurs are therefore busy finding 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. Third, biodiversity loss justifies entrepreneurial action to solve environmental problems.

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Schumpeter (1934), who contended that the innovations made by entrepreneurs are the major drivers of economic development and the fundamental factors in trade formation. The neo-Malthusian environmentalists, for example, supported Schumpeter's view but argued that over the past decades economic growth through entrepreneurial activity had not been going hand in hand with the preservation of the eco-system (Kate, Parris and Leiserowitz, 2005; Morelli, 2011). Thus, proponents of the neo-Malthusian ideology suggested that entrepreneurs as agents of "creative destruction" – as Schumpeter lyrically refers to them – could also be agents of a "creative solution" to address global environmental problems by introducing environmentally acceptable ideas, products and services (Dean and McMullen, 2007; York and Venkataraman, 2010). One such environmental approach to economic activity is through "ecopreneurship" and "green product initiatives".

Innovations can change economy and society fundamentally. In creating an innovation, one should be able to overcome limitations. Sustainable development needs continuous innovations and the entrepreneur who can achieve the environment purposes with superior innovations will be successful in the market. Entrepreneurship is viewed as a process of finding market opportunities and organization resources which are needed to use the opportunity to gain long term results. The player who has creative and innovative abilities for environment advancement in their core business are called 'ecopreneurs'. Ecopreneurship is an entrepreneurship concept which is not profit oriented only but also concern to other aspects, especially the environment aspect. Ecopreneurship is an entrepreneurship behavior which focusing on the environment sustainability in the future. According to Schaltegger, S.[2002], ecopreneurship is a combination of two words, ecology (eco) and entrepreneurship. Ecopreneurship is marked with several fundamental aspects from entrepreneurial activities which oriented to management system or technical procedures and more focused on the initiatives and personal or team skills to achieve market success with environmental innovations.

# LITERATURE REVIEW

A basic review of literature is made in this paper. According to Lawal (2016), a basic review of literature depicts planned efforts to locate, appraise and synthesize leading available evidence relating to a specific research problem in order to provide informative and evidence based answers. For the sake of a more comprehensive structure of this paper, discussions are presented under the following sub headings

Empirical review

# Entrepreneurship and Innovation

Most studies on entrepreneurship underscore its strong relationship with Innovation. Innovation is seen as the core action and a specific instrument of entrepreneurship (Drucker, 1985). Entrepreneurship and innovation can be considered as virtually synonymous (Acs & Audretsch, 2005). Many industries characterized by high rate of innovation also have high rates of new venture creation (Cooper, 2005). Entrepreneurship gives birth to new commodities, techniques and goods,

booting human progress forward and rendering the old obsolete, leading to the extinction of whole branches of industry and creation of new ones (Mellor, 2009). Entrepreneurship makes it possible to make new business where no previous industry or business existed. Entrepreneurs also make it possible to recombine existing business processes to form new value chains (Porter, 1990). The task of an entrepreneur, according to Schumpeter, is to indulge in creative destruction. The entrepreneur searches for change, responds to it and exploits it as an opportunity. Innovation is a specific instrument of entrepreneurship, and an entrepreneur indulges in systematic knowledgebased innovation, which can be viewed as a purposeful and organized search for changes and systematic analysis of opportunities offered by such changes (Drucker, 1985).

According to Kirzner (quoted in Kopplan & Minniti, 2005), entrepreneurs innovate and entrepreneurship encompasses alertness to new opportunities and seizing such opportunities by taking innovative action. Entrepreneurs, including start-up companies and venture capitalists are key stakeholders in the innovation processes (Zilbermann, 2005). Thus, innovation is the core action of an entrepreneur and his/her source of value addition to the society. There has been a debate in the literature of entrepreneurship on the relative effectiveness of established firms versus entrepreneurs on creating innovations. A classical view, attributed to eminent past economists such as Joseph Schumpeter (1942), has been that entrepreneurs have a competitive disadvantage for undertaking innovations since they being too small would fade away as the victim of their own inefficiencies. However, recent empirical evidence suggests that new ventures and small entrepreneurial firms play a key role in generating innovations, at least in certain industry and 6 11th International Entrepreneurship Forum Kuala Lumpur, Malaysia, 3-6 September, 2012 spatial contexts. Entrepreneurship plays a crucial role in innovation by providing a mechanism for knowledge to spill over from the organization producing that knowledge, to the (new) organization commercializing it (Acs and Audretsch, 2005). Entrepreneurs are in a much stronger position to reply to external threats, changes in the market and similar challenges. They may be in a stronger position to innovate (Mellor, 2009)

Entrepreneurship education benefits students from all socioeconomic backgrounds because it teaches students to think outside the box and nurtures unconventional talents and skills. Furthermore, it creates opportunity, ensures social justice, imparts confidence and stimulates the economy. Entrepreneurship promote economic opportunity and it can serve as an agent of social justice. Ecopreneurship is an entrepreneurship concept which is not profit oriented only but also concern to other aspects, especially the environment aspect. Ecopreneurship is an entrepreneurship behaviour which focusing on the environment sustainability in the future. This is an opportunity for ecopreneurs to produce products, services, techniques and organizations model which substantially reduce the environmental impact and increase the quality of life. One of ecopreneur focuses is to use the waste from productions into something useful and economical value.

## Eco - Innovation

Rennings (2000) 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 a concern 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 ideas, behaviour, products and processes, apply or introduce them, and which contribute to a reduction of environmental burdens or to ecologically specified sustainability targets." 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 important to point out here, that the idea behind factor X reduction is that the actual environmental effect of an innovation rather than the intention behind the innovation determines if an innovation is environmental. Rennings (2000) highlights the danger of a technology bias in the understanding of what constitutes an eco-innovation. He argues that unsustainable development itself is a result from technology outpacing changes in social organization, and thus emphasizes the importance of social innovations such as lifestyle-changes in order to tackle ecological problems. In this regard, authors (Wagner, 2008), Distinguish between integrated and end-of-pipe technology for environmental impact reduction. End-of-pipe or additive technology refers to measures mitigating the environmental effects of an essentially polluting or otherwise environmentally harmful product or service e.g. waste treatment, recycling or waste disposal. This is contrasted by the integrated systems approach which aims at every step of the way to minimize the environmental effect of the system, so that only little or no need for waste treatment or other mitigation arises. An example in case is a gasoline-powered car with a catalytic converter in the exhaust as compared to an electric car.

The catalytic converter removes only the most harmful by-products of the fumes created by the essentially harmful internal combustion engine, while the electric car delivers the same service (individual transportation) without the exhaust fumes. In order to analyse and compare ecoinnovation in different companies, one needs a scale, a unit of measurement, at least in a metaphorical sense. Many attempts have been made to classify or categorize innovations, mostly according to significance of the innovation, and/or the methods and procedures used in their development.

# Integrating Ecopreneurship into Entrepreneurship Education

Entrepreneurship students are an important target group for the development of innovation and entrepreneurial activities in the field of sustainability. However, the entrepreneurial capability of the students and the number of courses focusing on ecopreneurship and sustainability are still limited (Fletcher, Knol, &Jamicki (2012). In response to the requirement for more courses in ecopreneurship and sustainability entrepreneurship, this section describes integrating ecopreneurship into the entrepreneurship curriculum.

According to Bridges and Wilhelm (2008), one of the challenging curriculum issues is whether to have a course entirely dedicated to ecopreneurship or to integrate ecopreneurship into current course being offered. They argue 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 the approach that is selected, "the curriculum must cause students to challenge the following common assumptions: Humans are the dominant species and separate from the rest of nature, Resources are free and inexhaustible. Earth's ecosystems can assimilate all human impacts. Technology will solve most of society's problems, All human needs and wants can be met through material means,. Individual success is independent of the health and wellbeing of community's cultures, and the life support system" (Cortese, 2003).

According to Richardson, Irwin and Sherwin (2005), the knowledge base and skills sets needed to become on ecopreneur are very broad. The list includes awareness of both local and global issues, awareness of future trends, acquisition environmental values, and engagement in ecological or systems thinking.

Sustainability also identified additional skills sets needed by the entrepreneurship student: 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 buy-in and to gain support of a senior champion. In addition, ecopreneurship knowledge and skills must help graduates understand the critical challenge 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 generations. Above all, ecopreneurship programs need to graduate students who understand environmental entrepreneurship and who can apply sustainability frameworks to design new products, services, and processes.

Students were assigned readings, cases, as well as present current event articles from the business press related to the ecopreneurship topic under discussion. Working in groups, students were to propose entrepreneurial solutions to pressing environmental problems. Some examples of topics would include products or services that were contribute towards reducing energy consumption, conserving energy and water, improving water purification and filtration, improving waste management systems, and exploring alternative energy sources. Also, students were asked to present a sustainability plan/report for a given company or government entity.

The pedagogy for the course was to emphasize active, experiential, inquiry-based learning and real world problem solving in the classroom, on the campus and in the local community. We all know from the conventional wisdom and from educational research, that students retain 80% of what they do and only 10 to 20% of what they hear or read. Therefore, 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.

## **CONCLUSIONS**

The focus of this paper was to find out how entrepreneurship education and eco-preneurship

innovation can be the change agents for environmental problems by taking the advantage of the entrepreneurial opportunities within the environmental degradation and to explain the role of education in environmental sustainability. Based on our review of the literature, most researchers agree that environmental problems do represent entrepreneurial opportunities. Despite the changes in legislation and regulations to protect the environment, the United States and various other countries are still facing many environmental problems, e.g., climate change, population growth, overflowing landfills, water scarcity, fuel shortages, and water and air pollution (Oskamp 2000). If we are to solve these problems, entrepreneurship is a major part of the answer. According to Shepherd and Pratzelt (2011) "entrepreneurial action can preserve the ecosystem, counteract climate change, reduce environmental degradation and deforestation, improve agricultural practices and freshwater supply, and maintain biodiversity.

Secondly, ecopreneurs are not all the same. Some are environmentally oriented and start green businesses, some are partially environmentally oriented, and others only deal with environmental issues when they are forced to by external factors (Schick, et al 2002) The difference, they suggested, is the attitude of the entrepreneurs. One possible reason, they contended, is that for most of these ecopreneurs, environmental awareness was developed since childhood and has continued to be an integral part of their businesses. Ecopreneurship has fostered the community's awareness to the environment because it has succeeded to disenchant community that environment needs to be preserved by reducing rubbish and separating organic and inorganic rubbish, thus the recycled product process is easier and flexible. Simulations and trainings which are given to community about ways to improve their environment not to be polluted are simple, so anyone is capable to do so. Entrepreneurial education eventually has had an important role to keep the environment preservation.

Ecopreneurship has also increased the economy to build independent community in gaining mutual benefits. Individual creativity needs to be raised and supported by good cooperation between one another to increase the profit. If this effort is continuously developed, it would result in mutual community economy growth, not just the individual benefits that would be developed. Thus, collaboration between, environment, social, and economy are key factors in eco-preneurship implementation. This research conceptual model can be used by entrepreneurs, academics, government, and others who have benefited from the eco-preneurship concept implementation. Further research can be conducted with empirical test of proposed model, and to test the appropriateness of this model.

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