A REVIEW OF ECOPRENEURSHIP IN SOLID WASTE MANAGEMENT

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ABSTRACT

Sustainable solid waste management requires urgent attention, especially in developing countries like Nigeria. Entrepreneurship is recognised globally as a panacea to many environmental problems. A variant of entrepreneurship that attempts to resolve all kinds of environmental issues, including solid waste management, is called ecopreneurship. However, the extant literature is void of information on the ecopreneurship approach to solid waste management in Nigeria. This literature review utilises qualitative content analytical method to describe the traditional solid waste management practices (SWMPs) commonly employed in Nigeria and to pinpoint integrated solid waste management practice (ISWMP) as the domain of ecopreneurship in solid waste management. Four elements of ecopreneurship that could drive ISWMPs are identified – eco-culture, eco-innovation, eco-commitment and eco-enterprises. For the success of the ecopreneurship approach in solid waste management issues in the country, some guidelines are proposed to assist in policy formulation. In conclusion, the study acknowledges ecopreneurship approach as a viable option for resourceful and sustainable solid waste management in Nigeria.

Key words: Entrepreneurship; Ecopreneurship; Solid waste management; Sustainability, Policy

1. Introduction

Waste and its generation in many business situations (domestic and industrial activities) of life are inevitable. Recently, change in demographic composition, such as population and lifestyle, among other factors, constantly worsen the generation of wastes at all levels of society and organisation (Ike *et al*., 2018). Wastes occur in different forms – liquid (wastewater), solid and gaseous form, with associated diseases and health burdens. Although all the forms are a nuisance and constitute stress to the environment, solid wastes (SWs) appear to be the most tangible and ubiquitous in an environment. Besides, this category of waste has a tendency to undergo biological, chemical and physical transformations in an environment (Mishra *et al*., 2013). These transformations could turn SWs into another form/state (liquid or gas) that is also a waste in the environment.

In addition, SWs are commonly generated at both organisational and individual levels in rural and urban communities on a daily basis. In some cases, this type of waste is found littering and occupying a substantial part of the Earth's crust, including public roads and water bodies. Examples of such wastes include but are not limited to food and garden waste, paper, textiles, glass and ceramics, plastic and rubber, wood and furniture, and iron and steel. In most cases, this might be due to carefree attitudinal practices towards handling of SWs by the concerned stakeholders.

Traditionally, there are different approaches that are commonly employed to manage the SWs. These approaches include landfilling, incineration, open-dumping (indiscriminating dumping),

open-burning and recycling (Hoornweg *et al*., 2012; Rodić and Wilson, 2017; Mian *et al*., 2017). However, nearly all the aforementioned approaches are not environmentally friendly, as they could result in environmental degradation and pollution. This necessitates a quest for alternative solid waste management strategies that are not only environmentally effective, but also versatile and sustainable. It is imperative, as every nation of the world is now working relentlessly towards achieving the Sustainable Development Goals by 2030.

In recent times, integrated solid waste management strategy (ISWMS) emerged as a promising alternative to traditional methods of handling SWs. This strategy focuses on 4Rs (Reduce, Reuse, Recycle and Recover) as a resourceful method of managing SWs. That is, apart from the fact that the ISWMS is capable of achieving a safe environment, it is also acknowledged to be a form of green business. However, adoption of this strategy is more popular in developed than developing countries like Nigeria. To this end, for the strategy to be effective and embraced in the country, there should be a catalyst or vehicle of economic activities, such as entrepreneurship, to drive it.

Globally, entrepreneurship has been recognised by many academics, researchers and policy makers as a proven antidote to a series of pressing issues confronting the world. In other words, it has been noted to be an indispensable engine that drives economic and environmental sustainability via ecopreneurship. This special taxonomy of entrepreneurship, ecopreneurship, represents a holistic approach of doing business that gives detailed attention simultaneously to the economy, society and environment. In the extant literature, there is knowledge gap on how ecopreneurship can drive ISWMS in Nigeria. This study aims to advance knowledge in that domain.

2. Statement of the Problem

Hoornweg *et al*. (2013) revealed that the volume of SWs generated at the global level is increasing at an alarming rate. The authors reported approximately 1.3 billion tonnes per year of generated SWs globally, and that the figure is expected to increase to about 2.2 billion tonnes per year by 2025. The authors further attributed the changes in volume of generated SWs to increase in population and human activities. Similarly, Orhorhoro *et al*. (2017) added that there would be a significant increase in per capital generation of SWs, ranging from 1.20 kg to 1.42 kg per person per day within a couple of years.

In Africa, Oyebode (2018) noted that Nigeria is one of the countries that generates the highest volume of SWs. The author stated that despite the numerous policies and regulations on SWs management in the country, about 3.2 million tonnes of wastes are generated annually and only 20–30% of it is effectively handled. In the same vein, Agwu (2012) observed that the rate of SWs generation in the country ranges from 0.24 to 0.66 kg/day/person. The researchers then adduced the high population of the country, which exceeds 170 million, as the cause of this occurrence, in addition to other factors.

Improper and ineffective management of SWs could lead to a series of environmental problems, which in turn may affect the health of the public. Some of the environmental problems include: blockage of sewers and drainage networks, flooding, odour or choking of water bodies, contamination of groundwater as well as surface water, and breeding avenue for insects and scavenging animals (Mian *et al*., 2017). According to a survey conducted by UN-Habitat, the incidence of diarrhoea and acute respiratory infections is twice and six times higher respectively

in areas where SWs are not collected frequently, compared to areas where collection is frequent (Hoornweg *et al*., 2012).

Orhorhoro *et al*. (2017) observed that there is no town in Nigeria that could boast of finding a lasting and resourceful solution to the management of SWs in the country. This study leverages on the potency of ecopreneurship, as an effective driver of sustainable development, to solve issues surrounding SWs management in the country. Hence, it intends to provide answers to the following research question: how can ecopreneurship drive sustainable solid waste management in Nigeria?

3. Research Methodology

The research method employed for this study is qualitative content analysis. The method is a systematic process of making replicable, valid and objective inferences from texts in the context of their usage (Bengtsson, 2016). It aims at providing detailed knowledge and understanding of the phenomenon in question. With this method, the text data can take verbal, print, or electronic form, and may be sourced from either narrative response to research instruments such as open-ended questions, in-depth interview and focus group discussions, or from print media such as articles, books or manuals (Hsieh and Shannon, 2005). Oguntoye and Evans (2017) emphasised that the qualitative content analysis research method is extremely useful in conducting literature reviews.

For this review study, qualitative content analysis was done using print media as these are portable, durable and form a major means of disseminating news concerning the subject of this paper. Based on this technique, secondary data obtained from academic literature on ecopreneurship and waste management were used for this study. The academic literature adopted consists of top-rated journal articles, books and conference proceedings. In addition to the general search for keywords in the context of the research focus, author-supplied keywords in the academic literature on the subject matter were also used in this study. The author-supplied keywords such as entrepreneurship, ecopreneurship, green business and solid waste management, helped to identify and search for the concepts most closely related to a given topic (Bengtsson, 2016). Searches were conducted in Scopus and Google Scholar. The resulting data were analysed and synthesized so as to answer the research question.

4. Findings and Discussion

4.1. Working definition for solid waste management (SWM)

In order to arrive at a working definition for SWM, the construct, "solid waste management" was split into two main parts: solid waste and management. These parts were defined separately and their meanings were later integrated together to synthesise a working definition for SWM.

Solid waste was defined from different perspectives, following the extant literature. For example, Orhorhoro *et al*. (2017) defined waste as any material that is useless or of no practical use, which is willingly thrown away or abandoned at a particular place. Also, Igbinomwanhia (2011) described solid waste as remains or used items that are to be discarded or reused. Oyebode (2018) explained it as any tangible thing intentionally deposited on an environment – land, or water body at a particular period of time. The author further stated that the presence of such substances may be hazardous to humans and the environment in a short or long period of time. Drawing upon this literature, this study defined waste as an unwanted item deliberately or involuntarily set aside from usage, discarded or planned for reuse due to changes in environmental elements around man.

Williams (2018) explained management as a process of ensuring that work is done through a set of people. In their own views, Jones and George (2018) and Kinicki and Williams (2018) defined management as a set of activities involving planning, organizing, leading, and controlling of resources such as material, financial and human, to effectively and efficiently realise the set objectives of an organisation. This study adopted the latter definition of management, because managing solid waste requires more than one process or step.

Fischer and Jiang (2015) defined solid waste management (SWM) as the sequence of processes involving collection, transportation, recycling, disposal and monitoring of waste. Agwu (2012) defined the SWM construct as activities that encompass collection, storing, treatment and disposal of SWs in an environmentally friendly way. This study then defined SWM as a strategic process of controlling and monitoring of waste, which involves sequential stages of collecting, transporting, treating and safe-disposal of end products in a way that promotes a sustainable environment for society and economic activities.

4.2.Solid waste management practices (SWMPs) in Nigeria

In the world today, there are various types of SWMPs. This ranges from traditional to integrated options. This is reported in many studies conducted in different parts of the world. Specifically, researchers have examined thoroughly the SWMPs options in developed countries such as United Kingdom (UK) and the United States of America (USA), as well as developing countries such as South Africa and Nigeria. The studies show that there are different kinds of SWs generated in those countries at both the household and industrial levels. These include biodegradable and non-biodegradable SWs. It can also be deduced from the studies that SWs management options vary from country to country, depending on environmental factors such as the level of technology, civilization, industrialization, business policy and socio-economic well-being (Adetunji *et al*., 2015; Afuno and Rabiu, 2017; Ike *et al*., 2018). This implies that selection and adoption from available SWMPs in any country is a function of type of SWs generated and prevailing environmental factors in such country. In Nigeria, the common types of SWMPs include collection, dumping, burying and burning.

Collection of waste

This is one of the common traditional practices in managing SWs in Nigeria. It involves the collection of mixed SW materials from households and organisations. The main goal of this practice is not for further treatment of the waste, but to discard it from the environment where it is generated. The collection of the waste can either be done by households and organisations themselves or they may wish to pay for it. In the country, waste collection business is commonly undertaken by private organisations as well as government agencies. According to a study conducted by Amasuomo and Baird (2016) across Nigeria, Lagos State was the most effective and efficient in the collection of SWs in the country. The authors highlighted regular collection of SWs as the main strategy of the State government to ensure that the State is always clean. Also, Nabegu (2010) carried out a survey in Kano State, one of the most populous and heavily commercialised states in Nigeria, to examine the access of the inhabitant's SW collection services. Among the study respondents, 69% reported access to waste collection services. The study suggests that SWs collection is part of SWMPs in the country, but is not yielding satisfactory results. This is due to the fact that most of the SWs are not collected appropriately and are found littering some major roads of the country.

Dumping of waste

This practice can be called open or indiscriminate dumping of SWs into designated or non-designated dumping sites. Examples of non-designated dumping sites commonly used for disposal of SWs in Nigeria include flowing or non-flowing water bodies, road sides, and uncompleted and abandoned buildings (Rodić and Wilson, 2017). Both individuals that generate the wastes and service providers in the business of waste collection do engage in this act. Although this practice is unhealthy, people consider it as the simplest and cheapest means of managing SWs in Nigeria (Babayemi and Dauda, 2009; Oyebode (2018). This reveals the weak status of environmental instruments (regulations and policies, including implementation strategies) on SWM in the country which might make the citizenry relax concerns about safe management of SWs.

Burying/landfilling of waste

This is the oldest practice in managing SWs in Nigeria (Awosusi, 2010) although it is not as common as other practices in the country. It occurs only in some restricted parts of the country (Babayemi and Dauda, 2009). With this method, SWs are buried into the earth's crust and then covered up with soil, using either a bulldozer or other earth-moving vehicles.

Burning of waste

This practice is more commonly employed to manage SWs compared to the burying method in Nigeria. It involves setting fire on any kind of SWs in an environment such as in the corner of a compound (Achi *et al*., 2012). The burning could be done on bare land, in a container or an incinerator. For example, according to Babayemi and Dauda (2009), most saw millers do set their wood wastes like saw dust, on fire intentionally on naked land. Also, they allow the ashes of the wastes to be transported away by heavy rain into the environment.

4.3. *Integrated solid waste management practice* (ISWMP)

It is important to note here that all the traditional SWMPs earlier discussed have inherent environmental and health implications. Hence, those practices are not effective, resourceful or sustainable in managing SWs (Amasuomo and Baird, 2016). A couple of years ago, ISWMP emerged to solve problems associated with the traditional SWMPs. It is an interconnected system that combines a range of suitable techniques, technologies and management programmes in a holistic manner, to successfully manage SWs (McDougall *et al.*, 2001; Tchobanoglous and Kreith, 2002).

The ISWMP is based on the 4Rs (reduce, reuse, recycle and recovery) hierarchy of waste management. The hierarchy is then followed by disposal of residual wastes via incineration and landfill, or other disposal options in a safe and resourceful manner (Hoornweg and Bhada-Tata, 2012). The 4Rs in ISWMP are as follows:

Waste reduction and reuse: This involves minimization and prevention of waste right from the source. It entails reuse of waste in innovative ways, including product redesigning or modification.

Recovery of materials and recycling: This helps to reduce the quantity of disposed waste. It is achieved by reprocessing waste and subsequently returning the materials back to the economy. Prior to the recycling, informal waste pickers play a significant role especially in developing countries. The pickers help to recover substantial quantities of unwanted materials or discards either from their sources or disposal sites (Hoornweg *et al*., 2005). Recycling can be achieved in a variety of ways:

Anaerobic digestion of waste: This process often generates a gas called methane that could either be flared or used to generate heat and/or electricity. It is achieved by treating biodegradable or organic waste in an enclosed container.
Aerobic composting of waste: With this process, oxygen is allowed to act on biodegradable wastes in a vessel or pit to yield manure that can be used on agricultural land to augment soil nutrients for crop production.
Incineration: It reduces volume of waste by up to 90%. This high-volume reduction is extremely observable in waste streams containing very high quantity of combustible wastes such as packaging materials, paper, cardboard, plastics and agricultural wastes. With this process, open burning of SWs is particularly discouraged due to air pollution.
Landfill: The residue from each process described above is landfilled in a safe disposal manner. Landfill is a common final disposal means for the residue of integrated solid waste treatment processes. It is done in such a way that the environment and public health are not endangered.

4.3. Key characteristics of ISWMP

It is noteworthy to explain further that ISWMP varies across nations and organisations. Irrespective of the variation, ISWMP has some characteristics in common. To this end, it was deduced from Davidson (2011) that ISWMP:

a) is a holistic approach that assesses the overall environmental burdens and economic costs of the system altogether, for strategic planning purpose;
b) encompasses a range of collection and treatment processes that aims at producing very minimal waste;
c) takes care of all materials in the solid waste stream rather than focusing solely on specific or sources of materials;
d) is environmentally effective, as it is excellent in reducing the environmental burdens such as emission of deleterious gases associated with traditional solid waste management practices;
e) is economically affordable and a good source of business that generates a huge amount of income within a short period of time; and
f) has social acceptability. It encourages public participation and also ensures that individuals understand their role in the waste management system.

4.4.Ecopreneurship

The concept of ecopreneurship is also alternatively referred to as green entrepreneurship, ethical entrepreneurship, enviropreneurship, environmental entrepreneurship, ecological entrepreneurship and sustainable entrepreneurship in the literature. Although these concepts vary slightly in their definitions, they have a similar foundation, which is the tripod of safe environment, society and economy (Obisanya *et al*., 2016; McEwen, 2013).

In addition, ecopreneurship also represents eco-capitalism. This is a new market-based approach of identifying opportunities from environmental issues and capitalizing upon them for profit. Thus, an ecopreneur establishes a business that is not only driven by profit, but also by a concern for the environment. An ecopreneur, otherwise called green entrepreneur, is characterised by a willingness to start and manage a green business. The business may involve manufacturing of green products and/or rendering a service on green products. In other words, ecopreneurs do create green (environmentally friendly) jobs (Solaja, 2017). A category of ecopreneurs is also found engaged in the domain of business opportunities in green management of wastes, that is, turning waste into wealth, as found in ISWMP.

4.5.Elements of ecopreneurship to drive ISWMP in Nigeria

In the context of this study, ecopreneurship is described as a concept that consists of elements necessary to drive the resourceful practice of managing SWs, that is, ISWMP. These elements are vital for resourceful and sustainable management of SWs in Nigeria. They include eco-culture, eco-innovation, eco-commitment and eco-enterprises. This section presents a discussion of these elements.

Eco-culture

Eco-culture is a social philosophy that represents coexistence and mutual relationship between mankind and nature. It is necessary in achieving a cohesive and harmonious development among ecology (environment), economy and society (Zhou and Chang, 2014). It is also referred to as dominant behaviour, action, tradition, custom, belief and practices in a society towards safe environment. Eco-culture as an element of ecopreneurship, orientates behaviour towards resourceful practices in SWM. It could be imbibed through an effective ecopreneurship education, and therefore has the potential of giving birth to a series of ecopreneurs in Nigeria. For example, Mehra (2017) reported that the culture of every individual in India, a developing economy, is to create a business that is environmentally sustainable. The author reiterated that the use and reuse of every resource is a prominent practice of the society in the country. In addition, Zhou and Chang (2014) noted that eco-culture not only helps to resolve ecological crisis, it also promotes a resource-saving and environment-friendly society, as well as a circular economy.

Eco-innovation

It deals with the creation of new products, services, processes or market opportunities that is aimed at reducing the impact of such activities on the environment (Urbaniec, 2015). According to Kainrath (2009), eco-innovation encompasses all activities of ecopreneurs to reduce the environmental burdens associated with doing business. These activities are to develop and introduce new products or services, and/or apply new processes that are green. Furthermore, eco-innovation implies the creation of new business opportunities from environmental issues. Hence, eco-innovation plays a key role in the implementation of sustainable development in SWM.

Eco-commitment

This is also referred to as environmental commitment. Eco-commitment describes a strong desire or willingness to work hard, using energy, time and other resources, on a task or business, with a focus on achieving environmental sustainability. Eco-commitment might be influenced by different factors. According to Chukwuka and Nwomiko (2018), these factors represent three forms of eco-commitment – affective commitment, continuance commitment and normative commitment.

*Affective commitment***:** It is the strongest form of environmental commitment and refers to an emotional attachment to the environment. That is, the passion to achieve environmental sustainability goals. An ecopreneur operating under affective commitment to the environment always strives to achieve the most environmentally friendly possible solution to business issues. This situation could lead not only to more radical eco-innovations, but may also result in exploiting new eco-opportunities that others do not recognise or perceive in the environment.

*Continuance commitment***:** This form of eco-commitment is connected with the economic and social cost of disregarding environmental concerns, or what economists refer to as opportunity cost. Specifically, the commitment aims at minimizing the tangible and intangible costs of

disregarding environmental concerns. An ecopreneur operating under continuance commitment strongly respects social and economic norms. To this end, such an ecopreneur will constantly direct efforts at pursuing eco-opportunities, which are socially and economically acceptable.

*Normative commitment***:** This form of commitment is regarded as the weakest, because it gives birth to ecopreneurs that are committed only to the fulfilment of the minimum requirements of environmental legislation. Thus, an ecopreneur guided by this type of commitment will respond only to a feeling of obligation or indebtedness to the environmental phenomenon.

Eco-enterprises

This term refers to businesses that evolve in response to environmental sustainability strategies. For instance, recycling businesses in ISWMP. The solid waste recycling chain involves processes such as collection of discarded items, transportation of the items to a central point, sorting and grading such items, and final transportation to industrial recyclers. This creates jobs during collection, value addition and marketing of the new products. That is, the recycling business is capable of generating income for all the people involved in the value chain addition. Thus, eco-enterprises could reduce poverty, insecurity and accumulation of solid waste in the environment (Arora *et al*., 2014).

SW recycling business may focus, for example, on recycling of organic waste materials to generate manure or compost for sale to farmers and gardeners; recycling of plastic, paper, glass, metal and rubber to make new and marketable products; or recycling of biodegradable solid waste to produce renewable energy (biofuel) (Arora *et al*., 2014).

5. Guidelines on Policy Formulation for Ecopreneurship in Solid Waste Management in Nigeria

In order to nurture sustainable development in Nigeria, the country's national policy on environment covers several areas of the environment. These include erosion and flood control, agriculture, clean energy, culture, housing, natural resource conservation, land use and soil conservation (Akamabe and Kpae, 2017). Policies in those areas were put in place to respond to the nation's environmental objectives, which are to protect and improve the environment, and safeguard the water, air, land, forest and wildlife (Kankara *et al.,* 2013). Furthermore, there are many environmental policies that aim at managing all kinds of waste in the country. However, none of the policies is exclusively formulated to manage solid wastes in the environment. To this end, for effective and resourceful management of solid wastes via ecopreneurship in the country, there is a need for policy formulation in that domain.

This section proposes guidelines that could assist stakeholders in formulating relevant and effective policy on the phenomenon.

a) ***Capacity building:*** Since the citizens of the nation are involved in solid waste generation, it is imperative to focus on the public for solutions via acquisition of in-depth practical knowledge on sustainable solid waste management approaches. This should involve both formal and informal education as well as training on entrepreneurial handling of solid wastes in a way that generates eco-businesses in the country. Formal education might require integration of learning-by-doing approaches on sustainable solid waste management into school curricula at secondary and tertiary educational levels. Also, Research and Development (R&D) institutions on ecopreneurship should be established in all states of the country to boost opening of green business enterprises.

b) ***Solid waste management tools*****:** Strategies to ease accessibility and affordability of equipment necessary for effective management of solid waste, such as recycling machinery for paper, manure, biogas, plastic, iron and steel should be designed and incorporated into the policy.

c) ***Business environment*****:** The best course of action to make the country's business environment conducive for green business practices should be documented. This could be achieved by considering critically both micro (such as customers and intermediaries) and macro (such as economic, political, legal, sociocultural and technological factors) environmental elements of the Nation.

d) ***Private and foreign investors*****:** Private and foreign investors should be accommodated in the policy.

e) ***Financial aid*****:** This is one of key ingredients in setting up business enterprises. Financial aid strategies in terms of grants or loans should be targeted towards funding of eco-businesses, both start-ups and existing green business enterprises.

f) ***Policy enforcement*****:** Guidelines on strategies to enforce the policy should include motivation (financial reward) and penalty (financial cost). This should be the responsibility of the three tiers of government in the country. While individuals or organisations that embrace green practices in solid waste management should be motivated with financial rewards, defaulters should be penalised with a fine or levy.

g) ***Establishment of agency on ecopreneurship*****:** This would be a government agency for public service at all levels of government. The responsibility of such an agency will include setting up and managing sustainable solid waste industry, as well as overseeing and monitoring similar industries in the country on behalf of government.

7. Conclusion

This study explored ecopreneurship as a driver of resourceful and sustainable solid waste management in Nigeria. It acknowledged an ecopreneurship approach as a viable option for resourceful and sustainable solid waste management in Nigeria. This is because the traditional SWMPs (collection, dumping, burying/landfilling and burning of waste) that are commonly employed in the country are ineffective, uneconomical and unfriendly to the environment. As a result, ISWMP was recognised in this study as an alternative to the traditional practices. The integrated system of managing SWs is a holistic approach that focuses on achieving sustainable environment. ISWMP was discussed extensively in this study, based on the hierarchy – reduce, reuse, recycle and recovery strategy of waste management. In order to drive the ISWMP in Nigeria via ecopreneurship, four elements of ecopreneurship were identified. The elements are eco-culture, eco-innovation, eco-commitment and eco-enterprises. Lastly, for the promotion and success of this approach in managing SWs in the country, policy formulation in this domain is paramount. Thus, this study provided guidelines that could be useful in formulating such a policy. The guidelines provided are in the areas of capacity building, solid waste management tools, business environment, encouraging private and foreign investment, financial aid, policy enforcement and establishment of agency on ecopreneurship.

REFERENCES

Achi, H. A., Adeofun, C. O., Gbadebo, A. M., Ufoegbune, G. C., and Oyedepo, J. A. (2012). An assessment of solid waste management practices in Abeokuta, south west Nigeria. *Journal of Biological and Chemical Research*, *29*(2), 177-188.

Adetunji, M. A., Atomode, T. I., and Isah, I. O. (2015). Assessment of solid waste management in Lokoja, Nigeria. *Jordan Journal of Earth and Environmental Sciences*, *7*(2), 103-108.

Afuno, S. A., and Rabiu, S. (2017). Characterization and composition analysis of municipal solid waste in Kano, Nigeria. *Bayero Journal of Pure and Applied Sciences*, *10*(1), 493-497.

Agwu, M. O. (2012). Issues and Challenges of Solid Waste Management Practices in Port-Harcourt City, Nigeria: a behavioural perspective. *American Journal of Social and Management Sciences*, *3*(2), 83-92.

Akamabe, U. B., and Kpae, G. (2017). A Critique on Nigeria National Policy on Environment: Reasons for Policy Review. *International Journal of Geography and Environmental Management*, *3*(3), 22-36.

Amasuomo, E., and Baird, J. (2016). Solid waste management trends in Nigeria. *J. Mgmt. and Sustainability*, *6*, 35.

Arora, D., Mahapatra, S., and Balasubramanian, M. (2014). Solid Waste Management and Social Entrepreneurship-A key to sustainable development. *International Journal on Applied Bioengineering*, *8*(1).

Awosusi, A. O. (2010). Assessment of environmental problems and methods of waste management in Ado-Ekiti, Nigeria. *African Research Review*, *4*(3).

Babayemi, J. O., and Dauda, K. T. (2009). Evaluation of solid waste generation, categories and disposal options in developing countries: a case study of Nigeria. *Journal of Applied Sciences and Environmental Management*, *13*(3).

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *Nursing Plus Open*, *2*, 8-14.

Chukwuka, E. J., and Nwomiko, U. N. (2018). Sustainability-Oriented Practices of Eco-Innovation, Eco-Commitment and Organizational Performance of A Developing Economy. *World Journal of Research and Review*, *6*(4), 12-26.

Davidson, G. (2011). Waste management practices: Literature review. *Dalhousie University, Office of Sustainability*, 1-59.

Fischer, M., and Jiang, X. (2015). Numerical optimisation for model evaluation in combustion kinetics. *Applied energy*, *156*, 793-803.

Hoornweg, D., and Bhada-Tata, P. (2012). *What a waste: a global review of solid waste management* (Vol. 15, p. 116). World Bank, Washington, DC.

Hoornweg, D., Bhada-Tata, P., and Kennedy, C. (2013). Environment: Waste production must peak this century. *Nature News*, *502*(7473), 615.

Hoornweg, D., Lam, P., and Chaudhry, M. (2005). Waste management in China: Issues and recommendations. *The World Bank Urban Development Working Papers*, (9).

Hsieh, H. F., and Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, *15*(9), 1277-1288.

Igbinomwanhia, D. I. (2011). Status of waste management. In *Integrated Waste Management-Volume II*. Intech Open.

Ike, C. C., Ezeibe, C. C., Anijiofor, S. C., and Daud, N. N. (2018). Solid Waste Management in Nigeria: Problems, Prospects, and Policies. *The Journal of Solid Waste Technology and Management*, *44*(2), 163-172.

Jones, G. R. and George, J. M. (2018). Contemporary Management (10th edition). New York: McGraw-Hill Education.

Kainrath, D. (2009). *Ecopreneurship in theory and practice: A proposed emerging framework for ecopreneurship*.

Kankara, A. I., Adamu, G. K., Tukur, R., and Ibrahim, A. (2013). Examining environmental policies and laws in Nigeria. *Int. J. Environ. Eng. Manage*, *4*, 165-170.

Kinicki, A. and Williams, B. K. (2018). Management – A Practical Introduction (8th edition); New York: McGraw-Hill 2018.

McEwen, T. (2013). Ecopreneurship as a solution to environmental problems: implications for college level entrepreneurship education. *International Journal of Academic Research in Business and Social Sciences*, *3*(5), 264.

Mehra, S. P. (2017). Eco-Cultural Solution to the Challenge of Waste Generation at Individual Level: Case Study from India. *Int J Waste Resour*, *7*(288), 2.

Mian, M. M., Zeng, X., Nasry, A. A. N. B., and Al-Hamadani, S. M. (2017). Municipal solid waste management in China: a comparative analysis. *Journal of Material Cycles and Waste Management, 19*(3), 1127-1135.

Mishra, A. R., Mishra, S. A. and Tiwari, A. V. (2013). Solid Waste Management -Case Study. *International Journal of Research in Advent Technology* 2. 2321-9637.

Nabegu, A. B. (2010). An analysis of municipal solid waste in Kano metropolis, Nigeria. *Journal of Human Ecology, 31*(2), 111-119.

Ngare, I., Wemali, E., Gichuki, C., Gichuki, N., Kipkemoi, I., and Karanja, J. (2018). Integrating Environmental Concerns in Enterprises and Businesses for Sustainable Development. *International Journal of Environmental Science*, *3*.

Obisanya, J. F., Adegbite, S. A., Abereijo, I. O. and Oke, S. O. (2016) A Structure to Promote Ecopreneurship in Nigeria. *Ife Journal of Entrepreneurship and Business Management*, *2*(1).

Oguntoye, O., and Evans, S. (2017). Framing manufacturing development in Africa and the influence of industrial sustainability. *Procedia Manufacturing*, *8*, 75-80.

Orhorhoro, E. K., Ebunilo, P. O., and Sadjere, E. G. (2017). Determination and Quantification of Household Solid Waste Generation for Planning Suitable Sustainable Waste Management in Nigeria. *International Journal of Emerging Engineering Research and Technology*, *5*(8), 1-9.

Oyebode, O. J. (2018). Evaluation of Municipal Solid Waste Management for Improved Public Health and Environment in Nigeria. *European Journal of Advances in Engineering and Technology*, *5*(8), 525-534.

Rodić, L., and Wilson, D. (2017). Resolving governance issues to achieve priority sustainable development goals related to solid waste management in developing countries. *Sustainability*, *9*(3), 404.

Solaja, O. M. (2017). Ecopreneurship and Green Product Initiative (GPI): An Agenda for Nigeria's Sustainable Development in the 21st Century. *Studia i Materiały*, (1/2017 (23)), 103-118.

Urbaniec, M. (2015). Towards sustainable development through eco-innovations: drivers and barriers in Poland. *Economics and Sociology*, *8*(4), 179.

Williams, C. (2018). MGMT10 – Principles of Management (10th edition). Cengage Learning (Boston).

Zhou, X., and Chang, Y. (2014). Influence of Eco-Culture on Urban Development. *Journal of Environmental Accounting and Management, 2*(3), 205-215.