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Green entrepreneurial opportunities in the plastic recycling industry for sustainable development in Nigeria

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Abstract

Nigeria is a country which has the abundance of human and natural resources, including skills and talents which are needed to maximize the green entrepreneurial opportunities in the plastic recycling for sustainable development. Recognizing and maximizing the green entrepreneurial opportunities in the plastic recycling industry is therefore a climate change adaptation and mitigation strategy to ensure sustainable development in Nigeria. Combating the menace of plastic pollution has become a global environmental challenge which has profound climate change impacts. Plastic pollution has profound negative impacts on the health, socio-economic and agricultural sectors in Nigeria but this menace can be curbed via plastic recycling. Through literature review and participant observation, this study identified that there's a great need for recycling plastic wastes into a solution for wealth creation in Nigeria. It further seeks to identify innovative ways which includes the use of poetry and educational blogs to educate communities and institutions about the green entrepreneurial opportunities in plastic recycling in Nigeria.

Keywords: Climate change, green entrepreneurship, education, plastic recycling, sustainable development

Introduction

The earliest attempts aimed at finding a generalized definition for green entrepreneurship appeared around the 1990s. As reported by Hall, "green entrepreneurship" was first mentioned by Gustav Berle (1991) in his book, "The Green Entrepreneur: Business Opportunities That Can Save the Earth and Make You Money" (Hall, 2016). The author provided a poetic definition, explaining green entrepreneurship as the ability and willingness of humans to take up responsibilities of creating the kind of world they dream to live in (Hall, 2016). Nevertheless, interest on green entrepreneurship is huge, and cuts across all works of life. This can be proved based on the number of green entrepreneurship ideas in extant literature, and the proliferation of the concept (Gibbs, 2006) ^[21]. Green entrepreneurship is the activity of consciously addressing an environmental/social problem/need through the realization of entrepreneurial ideas with a high level of risk, which has a net positive effect on the natural environment and at the same time is financially sustainable (Greentproject, 2016) ^[23]. A green entrepreneur is someone who starts and runs an entrepreneurial venture that is designed to be green in its products and processes from the very moment it is set up (Anabaraonye, Chukwuma & Eriobu, 2019) ^[4]. Green entrepreneurs are valuable assets across various communities in Nigeria today. The Green entrepreneur sees the problems caused by climate change, environmental pollution and global warming; He/she also perceives the business opportunities in waste management and recycling and takes on the risk of engaging the process of waste recycling to ensure a sustainable environment and the sustainable economic growth of his community and nation (Anabaraonye, Chukwuma & Eriobu, 2019) ^[4]. The green business environment in Nigeria is moving at a very rapid rate. This can be seen in the number of green entrepreneurship business coming up. Recently, the National Power Training Institute of Nigeria (NAPTIN) partnered with a tech-based firm for the proposed development of a green innovation hub with the single goal of driving green business development within the Nigerian energy sector, while also improving relationship between public and private organizations (UN Habitat, 2017) ^[48]. According to the UN Habitat (2017) ^[48], green entrepreneurship trainings

also equip interested young person with all the required knowledge in the green business value chain and gives them the opportunity to be a part of the solution to existing environmental challenges through green business ownership. An important consideration in the push for green entrepreneurship is public perception towards green services and products. This can either make or mar the development of green entrepreneurship. Furthermore, when green entrepreneurship thrives in Nigeria, the rate of unemployment amongst the youths will be drastically reduced and this will go a long way to help to achieve the sustainable development goals (Richard, Olatunji & Samuel, 2021) ^[43]. From all indication, Nigeria needs to embrace various methods through which the unemployment rates among the youths can be reduced. One way to do this is to embrace green entrepreneurship, especially as the nation has a population that continues to generate huge amount of waste. As such, investment should be directed towards cleaner production and waste-to-wealth efforts (Richard, Olatunji & Samuel, 2021) ^[43]. With this recognition was the emergence of Project Green Initiative in 2017 in Nigeria which serves to educate stakeholders in various sectors of the economy toward sustaining green environment for green entrepreneurial activities and opportunities (Anabaraonye, Chukwuma & Eriobu, 2019) ^[4]. Green entrepreneurial opportunities abound in the plastic waste management and plastic recycling industry in Nigeria today. The reduction and recycling of plastic waste can help address global warming and climate change as they are potent strategies for reducing greenhouse gas emissions. The plastic waste management and plastic recycling businesses have a plethora of opportunities in the industry. Thousands of businesses operate within several niches in its space, and they all go on to serve a varying number of clients seeking different solutions to their waste management problems (Anabaraonye, Chukwuma & Eriobu, 2019) ^[4].

Methodology

This paper examined current progress with the green entrepreneurial opportunities in the plastic recycling industry in Nigeria which is a climate change adaptation and mitigation strategy for sustainable development through existing literature review and data collection from relevant agencies. The main purpose of this research work was to survey theoretical backgrounds and previous studies on the green entrepreneurial opportunities in the plastic recycling industry in Nigeria and the current progress with the implementation of these strategies in Nigeria and its role in ensuring sustainable economic growth and development in Nigeria.

Results and Discussion

Climate change is already having significant impacts in Nigeria, and these impacts are expected to increase in the future. Recent estimates suggest that, in the absence of adaptation, climate change could result in a loss of between 2% and 11% of Nigeria's GDP by 2020, rising to between 6% and 30% by the year 2050. This loss is equivalent to between N15 trillion (US\$100 billion) and N69 trillion (US\$460 billion) (BNRCC, 2011) ^[13]. However, the plastic recycling industry in Nigeria can play a great role in climate change adaptation and mitigation thereby helping to achieve sustainable economic growth and development in the nation. Climate change adaptation and mitigation strategies in the

plastic recycling industry which provides opportunities for green entrepreneurship in Nigeria will certainly go a long way in meeting development needs and helping the country to achieve the sustainable development goals. The impact investment strategies for maximizing opportunities in plastic waste recycling industry in Nigeria will further help in building resilience and reducing vulnerability for a sustainable future.

Understanding plastic waste recycling

Waste Recycling is a process of converting waste materials into new products to prevent waste of potentially useful materials, partly supplement the consumption of fresh raw materials, reduce energy usage, reduce air pollution from incineration and water pollution from land-filling by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions (Bank of Industry, 2018) ^[11]. Waste is defined as any unavoidable material resulting from domestic activity or industrial operation for which there is no economic demand and which must be disposed of (Sridhar 1996) ^[45]. Waste generation is increasing at an alarming rate. Countries are rapidly developing without adequate systems in place to manage the changing waste composition of citizens. According to the World Bank's "What a Waste 2.0" report, the world generates 2.01 billion tonnes of municipal solid waste annually, with at least 33% of that not managed in an environmentally safe manner (World Bank, 2018) ^[51]. Waste management (or waste disposal) are the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process. Waste can be solid, liquid, or gaseous and each type has different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. In some cases, waste can pose a threat to human health. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce adverse effects of waste on human health, the environment or aesthetics. Waste generation is expected to rise with economic development and population growth, lower middle-income countries are likely to experience the greatest growth in waste production. The fastest growing regions are Sub-Saharan Africa and South Asia, where total waste generation is expected to triple than double by 2050, respectively, making up 35% of the world's waste (World Bank, 2018) ^[51]. Solid waste management is a universal issue that matters to every single person in the world. With over 90% of waste openly dumped or burned in low-income countries, it is the poor and most vulnerable who are disproportionately affected. In recent years, landslides of waste dumps have buried homes and people under piles of waste. And it is the poorest who often live near waste dumps and power their city's recycling system through waste picking, leaving them susceptible to serious health repercussions (World Bank, 2018) ^[51]. Plastic recycling refers to the process of recovering waste or scrap plastic and reprocessing the materials into functional and useful products. The goal of recycling plastic is to reduce high rates of plastic pollution while putting less pressure on virgin materials to produce brand new plastic products. Plastics that act as pollutants are categorized by size into micro-, meso-, or macro debris (Hammer, Kraak & Parsons,

2012). Plastics are inexpensive and durable making them very adaptable for different uses; as a result humans produce a lot of plastics (Hester, Ronald & Harrison, 2011) ^[30]. However, the chemical structure of most plastics renders them resistant to many natural processes of degradation and as a result they are slow to degrade (Guern & Claire, 2018) ^[24]. The distribution of plastic debris is highly variable as a result of certain factors such as wind and ocean currents, coastline geography, urban areas, and trade routes. Human population in certain areas also plays a large role in this. Plastics are more likely to be found in enclosed regions such as the Caribbean. It serves as a means of distribution of organisms to remote coasts that are not their native environments. This could potentially increase the variability and dispersal of organisms in specific areas that are less biologically diverse. Plastics can also be used as vectors for chemical contaminants such as persistent organic pollutants and heavy metals (Barnes *et al.*, 2009) ^[10]. Plastic wastes can bring about plastic pollution which lead to environmental degradation and other climate change issues. Plastic waste recycling is among the climate change mitigation strategies for achieving sustainable development in Nigeria. Plastic recycling education will bring about behavioural change and public participation which is said to be the key to a functional waste management system (Anabaraonye, Chukwuma & Eriobu, 2019) ^[4]. “Poorly managed waste is contaminating the world’s oceans, clogging drains and causing flooding, transmitting diseases, increasing respiratory problems from burning, harming animals that consume waste unknowingly, and affecting economic development, such as through tourism,” said Sameh Wahba, World Bank Director for Urban and Territorial Development, Disaster Risk Management and Resilience (World Bank, 2018) ^[51]. A great percentage of materials are being recycled and are being used as household products and their number is increasing by the day. The most common recyclable material is plastic. Many plastic products and bags are in use nowadays. Plastic recycling serves as a solution to plastic pollution ravaging the earth. Plastics are polymers and are resinous and they are melted down to make other products. Most importantly plastic containers like water bottles, beverage containers, milk bottles, soap boxes, etc. can be easily recycled (Bank of Industry, 2018) ^[11].

What is plastic pollution?

Plastic pollution can be defined as the accumulation of plastic objects and particles (e.g. plastic bottles, bags and microbeads) in the Earth's environment that adversely affects wildlife, wildlife habitat, and humans (Britannica, 2013) ^[14]. Plastic pollution can afflict land, waterways and oceans. It is estimated that 1.1 to 8.8 million tonnes of plastic waste enters the ocean from coastal communities each year (Jambeck *et al.*, 2015) ^[31]. Plastic pollution is also capable of affecting land, waterways and oceans as a large percentage of marine and land creatures have died due to the fact that plastic is non-biodegradable and it causes hazards to soil. Living organisms, particularly marine animals, can be harmed either by mechanical effects such as entanglement in plastic objects, problems related to ingestion of plastic waste, or through exposure to chemicals within plastics that interfere with their physiology (Walker *et al.* 1997; Barnes *et al.*, 2009) ^[50, 10]. Oceanic plastic pollution has become a recent flashpoint for public concern.

Ocean plastic is expected to triple in the next decade, and public concern has prompted leading organizations around the world to take action towards better plastic resource management and pollution prevention (Pew Charitable Trusts, 2020). Solid waste management is the most pressing environmental challenge facing urban and rural areas in Nigeria. Nigeria’s population is estimated to double by 2050 and that could mean more solid waste hanging around and more plastic for recycling (Obiezu, 2019) ^[36].

Green entrepreneurship and plastic recycling industry in Nigeria

Entrepreneurs are individuals who conceive new business opportunities and take on the risk required to convert those ideas into reality (Ataman *et al.*, 2018) ^[9]. Entrepreneurs play an important role as the engine of change in a market based economy since they are responsible for introducing innovation, adaptation and new ideas (Demuth, 2015). Afolabi (2015) ^[1] explained that the Global Economic Monitor indicates that nations with higher levels of entrepreneurial activity enjoy strong economic growth. Green Entrepreneurial practices are those activities that are related to products or processes that are involved in reducing, reusing and recycling of resources for economic, environmental and social sustainability, Fulvia *et al.* (2011) ^[20]. There is great need for green entrepreneurs to rise up to the responsibility of tackling plastic pollution through proper plastic waste management and recycling in Nigeria. Nigeria generates an estimated 32 million tons of solid waste per year, one of the highest amounts in Africa. Of that figure, plastic constitutes 2.5 million tons (Obiezu, 2019) ^[36]. Local recyclers, including 55-year-old Mahmud Ahmed, buys plastic and aluminum waste at a low price, then converts it into reusable products, especially pots, local burners and cookware before they are sold (Obiezu, 2019) ^[36]. With the global plastic recycling market estimated to hit over \$60 billion by 2025, fuel retailing company, Enyo Retail and Supply Limited have stated that Nigeria is way behind top gainers of the recycling business. The Chief Executive Officer of Enyo Retail and Supply Limited, Abayomi Awobokun, at a virtual press conference to herald its yearly Enyo Open Ideas Competition (EOIC) scheduled to run from June 28th till October 2021, said although the plastic recycling business in Nigeria has potential to generate job opportunities and wealth creation for the nation, more needs to be done to catch up with its counterparts (Editor, 2021) ^[16]. Nigeria is one of the biggest contributors of solid waste in Africa with an estimated 32 million tons each year. Environmental engineer Maryann Atseyinku, the founder of Community Waste and Recycling, says that while small in scale, local recyclers are making an impact exchanging trash for cash (Obiezu, 2019) ^[36]. Enyo Open Ideas Competition (EOIC) is one of the new initiatives geared towards encouraging youths to maximize the green entrepreneurial opportunities in the plastic recycling industry for sustainable development in Nigeria. EOIC is an annual competition that is aimed at giving Nigerians the opportunity to express their creativity by providing sustainable solutions to the environment. The 2021 edition themed “Enyo Recyclit” is geared at encouraging participants on generating ideas to reuse, recycle and refurbish materials to conceive a service station concept and design that is futuristic (Editor, 2021) ^[16]. It is good to understand how to safeguard the health of Nigerian

communities through the practice of proper waste management and recycling of plastic waste materials. In many developing countries like Nigeria, indiscriminate dumping of waste materials and uncontrollable burning of these materials such as pure water sachet, plastic rubber that has been used and discarded, has been blamed on poor management of the process by the government (Onwughara, Chukwu, Alaekwe & Albert, 2013) ^[41]. The environmental and human right risk of dumping of waste in Nigeria has also been noted (Terada, 2012) ^[46]. There is therefore the need for proper plastic waste management and recycling to help ensure a sustainable environment in Nigeria. The recycling of waste disposed into renewed products minimizes the risk that comes with incineration option. When plastics are burnt, it releases toxic substances such as greenhouse gas into the atmosphere thereby increasing the force of pollution of the environment. But with recycling, the potential threats to existential realities are minimized and the given community is exonerated for environmental sustainability. Plastic recycling reduces the chances of an outbreak of diseases. Thus, it becomes the platform of disease control. Plastic recycling exonerates the people in communities from air, water and land pollutions. It reduces the practice of open-air burning and landfill fires. Recycling is a major source of entrepreneurial revolution not only in Nigeria but around the World. In Nigeria, arising from the continued proliferation of underemployed and unemployed youths in major cities and rural dwellings, these youths have taken the platforms of the waste management and recycling business to better their income and to reduce the risks of their various survival adventures. Waste recycling is a platform for employment generation, income and engine room for socio-economic development when harnessed more. While health concerns are a major issue with waste management and recycling, the economic implications of waste recycling which is a climate change mitigation strategy cannot be over-emphasized. Financial abundance and ample profits are added advantages for the few audacious and courageous individuals that can see the business opportunity in collecting the plastic wastes which go beyond striving to keep their environments clean. When collecting recyclable waste, the savvy individuals in the business filter exactly what they want. You can decide to collect only plastic waste, only aluminum can wastes, only rubber wastes, any other type, or all of them. Executing recycling business ideas that focus on the collection of a particular type of waste keeps the recycler's business streamlined, makes waste collection easier, and increases the chances of profitability (Edom 2016) ^[17]. All over the world, the idea of recycling has been welcome as an engine of socio-economic development because it has been seen as the route for employment generation and its broad public appeal and obvious environmental advantages (Onwughara, Chukwu, Alaekwe & Albert, 2013) ^[41]. If waste recycling is carefully implemented, environmental pollutions, degradations and other human activities that are detrimental to the nature and environment will be reduced to its barest minimum and this will help to achieve the United Nations Sustainable Development goals. Studies have shown that there are entrepreneurial opportunities in waste management and recycling for sustainability in Nigeria. There's nothing more exciting than having fun and making money while at it (Anabaraonye, Ewa, Anukwonke, Eni, Anthony, 2021) ^[5]. When it comes to waste recycling, it's about of keeping

your environment clean and generating income at the same time. According to Mr. Stan Edom, "Recycling is the perfect example to use when stating that people see gold right in front of them, yet they do not know it. Recycling business ideas and opportunities are largely overlooked because of the low awareness surrounding the industry in Nigeria" (Edom 2016) ^[17].

The benefits of plastic recycling include

1. Plastic recycling conserves energy as recovered materials use less energy in the recycling plant compared to that needed for products obtained from virgin materials. This conserves energy in terms of electricity or fuel.
2. Plastics recovered from solid waste become a source of valuable raw materials to industries, thereby reducing foreign importation for countries dependent on those materials, while excess production could be exported.
3. Plastic recycling reduces the waste disposal costs.
4. Plastic recycling prevents the emission of excess greenhouse gases and water pollutants. It also helps to reduce greenhouse emissions that lead to global warming.
5. Plastic recycling reduces litter which makes communities look untidy and thereby attracts more foreign investors to the communities.
6. Plastic recycling if carefully and properly implemented can be a source of livelihood to unskilled workers in a developing country, as it creates employment.
7. Plastic recycling can be cost beneficial to the economy of the nation by increasing the country's gross domestic product (GDP).
8. Plastic recycling will help cities become more resilient to the extreme climate occurrences that cause pollution, flooding, damage infrastructure, and displace communities and their livelihoods.
9. Plastic recycling can create employment, improve local industrial competitiveness, reduce poverty, and reduce municipal spending.

Recommendations

Nigerian government should establish and promote public policies within their borders to increase the awareness of proper plastic waste management and recycling for environmental sustainability. Leadership summits on plastic waste management and plastic recycling, waste management educational poems and blogs, are recommended as important tools which can be used in educating communities and cities in Nigeria on plastic recycling for sustainability locally, nationally and globally (Anabaraonye, Ewa, Hope, 2021) ^[5]. Communities, companies and various institutions in Nigeria can make the task of plastic waste management and recycling easy by placing labeled containers in the open for public use, or providing bins for home and business owners for strategic waste disposal and waste collection for recycling. There is also great need for further research in this field of study to enhance adequate knowledge and appropriate adaptation and mitigation to climate change through proper plastic recycling for sustainable development in Nigeria. Co-ordinated, collaborative efforts to address the health implications of accumulated plastic waste not only require policy frameworks but also concrete actions on behalf of health practitioners for environmental sustainability.

Conclusion

Since everyone is involved in one way or the other in production of waste, everyone's effort is needed to ensure a cleaner, greener and healthier environment for sustainable development both locally, nationally and globally (Anabaraonye., Okon, Ewa., Adeniyi & Nwobu, 2022) ^[6]. Moving toward sustainable plastic waste management and proper plastic recycling in Nigeria requires lasting efforts and a significant cost. Our planet needs to be preserved for future generations and its inhabitants are in the best position to do that. Let's join hands today to make our world better for our future and that of our children tomorrow by engaging good plastic waste management and recycling strategies for sustainable development in Nigeria.

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