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## Innovative strategies for awareness creation on plastic waste management in Nigeria

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### Abstract

The demand for plastic products is on the rise with increasing demand in different sectors of human society. This amounts to the generation of plastic waste globally at an alarming rate thereby leading to plastic pollution. This study identified that plastic pollution is one of the challenges plaguing the universe status quo with more than estimated eighty million tons of plastic-related wastes being released into the sea annually. Plastic pollution affects the health, socio-economic, and agricultural sectors in Nigeria in a profound way. This study further identified the great need for proper plastic waste management strategies in order to enhance public health in Nigeria. It recommended the innovative tools of poetry, music, and educational blogs among others for use in plastic pollution education for sustainable development in Nigeria. It also recommended plastic recycling as one of the innovative strategies to enhance public health for sustainable development in Nigeria. This study issued a clarion call for more intensive research on the impacts of plastic pollution on public health in Nigeria. It concluded by highlighting the need for greater international collaborations and partnerships in finding a sustainable solution to the global menace.

**Keywords:** Climate change, education, plastic pollution, public health, sustainable development, waste management

### Introduction

The World is plagued with the devastating effects of climate change. There are increasingly bitter complaints at different regions of the globe of the devastating effects of climate change. Cases include earthquakes, floods, hurricanes, droughts, erosion and heavy rainfall patterns to mention but a few. These devastating effects have attracted global attention to find ways communities, cities and campuses can leverage on the activities of green offices to eradicate plastic pollution and achieve the United Nations Sustainable Development Goals on climate action.

In Nigeria, where the effects of climate change are already being felt, green offices can play a crucial role in driving sustainability and enhancing green entrepreneurship through proper plastic waste management. The total global production of plastics from its inception to 2018 is estimated at 8,300 million metric tons (Royer *et al.*, 2018) <sup>[34]</sup>. Globally, plastic waste constitutes more than 60% of the total global municipal solid waste of which 22% was recovered and 78% disposed of. (Ogwo *et al.*, 2013; Ayo *et al.*, 2017) <sup>[22, 9]</sup>. An estimated 367 million tonnes of plastic were produced in 2020 with the production rate of about 12 tonnes of plastic waste produced per second (Sogbanmu, 2022) <sup>[25]</sup>. Over 280 million tons of plastics are produced annually and approximately 75% of the demand comes from four major sectors: packaging, construction, automotive and electrical or electronics (Thevenon and Oliver, 2014) <sup>[28]</sup>. Economic development and people's changing patterns of consumption and production have led to a drastic increase in plastic waste all over the world (Chow *et al.* 2017) <sup>[13]</sup>. Plastic pollution is everywhere in the global ocean, and levels have grown exponentially. The United Nations (UN) called it a 'planetary crisis' (MacLeod, Arp, Tekman, & Jahnke, 2021) <sup>[21]</sup>, while Daltry, Merone, and Tait (2021) <sup>[14]</sup> referred to it as a 'plastic pandemic'. Between 1996 and 2014, more than 23,400,000 tons of plastics were imported into Nigeria's technological sector, yet, less than 12% of the ensuing garbage was recycled.

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There is a need for sustainable management of this significant waste and resource category, given the threats this volume poses to local and global habitats and human health (Ugochukwu *et al.*, 2018) <sup>[29]</sup>. In some regions such as Nigeria, there have been substantial efforts to lessen plastic pollution by promoting plastic recycling and reducing the consumption of plastic (Walker, Tony and Xanthos, 2018) <sup>[31]</sup>.

### Materials and Methods

Data used for this study is derived from published works including academic articles, journals, conference papers, textbooks, and internet materials. This paper examined current progress with “Innovative strategies for awareness creation on plastic waste management in Nigeria” 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 subject matter.

### Results and Discussion

In 2019, an international multidisciplinary Lancet collaboration concluded that climate change poses unacceptable threats to the health of current and future populations worldwide (Watts, Amann & Arnell, 2019) <sup>[33]</sup>. Extreme weather events, rising temperatures, flooding, droughts, air pollution, and wildfires are steadily increasing around the world (Finkel, 2019) <sup>[19]</sup>. Climate change is among the greatest public health threats of the 21st century and a defining modifier of the global burden of disease (Watts, Amann & Arnell, 2019) <sup>[33]</sup>.

Plastic pollution is the buildup of plastic particles, such as plastic bottles, plastic bags, and much more, in the global environment that adversely affects wildlife habitats, wildlife, and humans (Laura, 2018) <sup>[20]</sup>. Plastic, one of the most preferred materials in today's industrial world is posing a serious threat to the environment and consumer health in many direct and indirect ways. Exposure to harmful chemicals during manufacturing, leaching in the stored food items while using plastic packages or chewing of plastic tethers and toys by children are linked with severe adverse health outcomes such as cancers, birth defects, impaired immunity, endocrine disruption, developmental and reproductive effects, among others (Rustagi, Pradhan & Singh, 2011) <sup>[24]</sup>. Plastic pollution is destroying wildlife, damaging ecosystems, clogging drainage systems, and harming fisheries and tourism. Solving the plastic pollution problem is part of solving the climate change problem ravaging the world. Solutions for plastic waste and plastic substitutes will need to come through innovations. New skills, knowledge and education can help create enduring solutions to plastic pollution and develop systems whereby communities can turn waste into wealth, a concept that helps to view waste management of all types as a resource rather than a refuse (Sosale *et al.*, 2021) <sup>[26]</sup>. Emeka and Lesley 2020 <sup>[17]</sup>, opined that over 60 million plastic sachet water bags are consumed and disposed of daily in Nigeria, and single-use plastic shopping bags and takeaway packs are ubiquitous. Beyond the toxicity of plastic waste, they find their way to different environmental media. They pollute soils, clog drains and waterways and eventually cause an overflow of water and sewage. Subsequently, this becomes the breeding ground for disease-spreading germs and bacteria (Akinola, Adeyemi, and Adeyinka, 2014) <sup>[1]</sup>. Plastic

bags otherwise known as poly bags or Nylon bags in Nigeria are essential parts of the everyday routine of millions of Nigerians. Plastic bags are popularly used for packaging items, shopping, and mostly single-use. Across Nigeria, the use of plastic bags is common in households, shopping malls, offices, supermarkets, local markets, schools etc. Waste plastic sachet water bags and polyethylene (cellophane) as well as other plastic products are made of non-biodegradable elements; therefore, they are not decomposable, and results to visual pollution (Okolo, Amaechi, Olisah, Onwuzurike & Anabaraonye, 2022) <sup>[23]</sup>. Besides markets, water industries in Nigeria also make use of these bags to package drinking water. It is believed that plastic sachet water, popularly known as pure water in Nigeria was introduced by one Mrs. Victoria Bolanle Oginni in the year 1990 (Babatunde, and Biala, 2010; Azuh, 2015) <sup>[11, 10]</sup>. Since this invention, the production and consumption of sachet water has come to stay, and it is widely accepted by Nigerians. Its introduction has birthed several brands as many entrepreneurs have ventured into the business. Sachet water is affordable and widely sold in shops, kiosks, streets hawkers, parks, and markets for as low as 10 naira (\$0.028) in some parts of the country pollution (Okolo, Amaechi, Olisah, Onwuzurike & Anabaraonye, 2022) <sup>[23]</sup>.

### Health benefits of plastic waste management and plastic recycling in Nigeria

Plastic pollution education alongside climate change education can promote innovation to expand solutions and equip people with skills to build with environmentally friendly, energy efficient, and climate resilient materials and renewable energy options. Such curriculum content that is focused on climate change adaptation and mitigation can also change behaviours and foster knowledge that can lead to climate action (Anabaraonye, Okafor, Hope, 2018) <sup>[6]</sup>. 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 (Anabaraonye, Chukwuma & Eriobu, 2019) <sup>[4]</sup>. The plastic waste management and plastic recycling businesses have a plethora of opportunities in the industry. Thousands of businesses operate within several niches in their space, and they all go on to serve a varying number of clients seeking different solutions to their waste management problems (Edom 2016) <sup>[16]</sup>. When it comes to plastic waste management and plastic recycling, it's about of keeping your environment clean, eradicating plastic pollution and generating income at the same time (Anabaraonye, Chukwuma & Hope, 2019) <sup>[4]</sup>. According to 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) <sup>[16]</sup>.

### Maximizing the green finance in awareness creation

Green finance is a relatively new field that has emerged in response to the growing global awareness of the urgent need to mitigate climate change and other environmental challenges. According to the United Nations Environment Programme (UNEP), green finance is "the financing of investments that provide environmental benefits in the

broader context of environmentally sustainable development" (UNEP, 2016) <sup>[30]</sup>. This includes both financing for green projects and the development of financial products and instruments that support environmentally sustainable economic development. Green financing obviously will help to enhance the awareness creation on proper plastic waste management in Nigeria. Green financing will also help to develop and accelerate plastic waste management projects for sustainable development in Nigeria.

### The Benji poetry and music global concepts

The poem "Reduce, Reuse and Recycle" advanced by the Benji Poetry And Music Global Concepts further illustrates how poetry can be used to in the awareness creation of innovative plastic waste management strategies in Nigeria.

#### Poem: reduce, reuse and recycle

Reduce, recycle and reuse  
Accentuate our sustainable development  
Environmental pollution we must refuse  
To help ensure our world's betterment.

Reduce, recycle and reuse  
Keep our environment clean and green  
Green entrepreneurship let us use  
To give our youths a livelihood means.

Reduce waste, recycle and make some gains  
Financial abundance is the promise  
For those who engage to regain  
Waste recycling is a venture-wise.

Waste can be a detriment to health  
Inflicting diseases and conflicts  
Waste can be turned into wealth  
Waste recycling is a venture of profits.

Recycling conserves natural resources  
And helps protect the environment  
Recycling is a good income source  
An engine room for socio-economic development.

Recycling gallantly reduces emissions  
Of excess greenhouse gases  
Recycling creates job provisions  
For the unemployed and underemployed masses.

Reduce, recycle and reuse  
A breath of fresh air to the community  
Now health and wealth can be induced  
With the hope of a brighter future, we see (Anabaraonye, 2019) <sup>[2]</sup>.

#### Recommendations

1. The inclusion of plastic pollution education in Nigeria's educational curricula at all levels is pertinent in entrenching the right attitudes to enhance public health. There is a dire need to educate the populace on the 5 "R" strategies of plastic waste management in Nigeria.
2. Plastic pollution prevention is partially addressed by the slogan: reduce, refuse, reuse, repurpose and recycle. This focuses on what individuals can do to divert

pollution from the environment thereby enhancing public health.

3. Long-term planning towards effective plastic waste management in major industries and infrastructure in Nigeria is greatly needed. We need to work hard to prevent new contamination of plastic pollution. Targeting the causes of plastic pollution before it happens is far more effective than cleaning it up afterwards (Tekman, Walther, Peter, Gutow, & Bergmann, 2022) <sup>[22]</sup>.
4. Similar to the climate crisis, this issue of plastic pollution affects the entire planet. Plastic pollution levels are continuously increasing, and global collaborations and systemic solutions will succeed in response. Encouragingly, public attention is now focused on the issue, and calls are growing for decisive international action to turn the tide before plastic pollution overwhelms the resilience of a critical number of marine species and ecosystems (Walther, 2015) <sup>[32]</sup>.
5. A far more important approach is simply to prevent plastic waste from entering the environment in the first place, which also implies a major reduction in primary plastic production. Such an approach would have additional benefits including reduced resource use and pollution from manufacturing, transportation and disposal of plastic waste thereby enhancing public health in Nigeria (Dibia, Wala, Onwuzurike, Anabaraonye & Arinze, 2023) <sup>[15]</sup>.
6. The Nigerian Government should provide sufficient funds to passionate and capable youths to enable them to appreciate and maximize the green entrepreneurial opportunities in plastic waste recycling thereby helping to eradicate plastic pollution in Nigeria (Anabaraonye, Nwobu, Nwagbo, Ewa & Okonkwo, 2022) <sup>[7]</sup>.
7. More efforts have to be put towards increasing people's awareness about bio-based and biodegradable products, their properties, their use, and the environmental and human health impacts (Filho, Barbir, Abubakar, *et al.* 2022) <sup>[18]</sup>.

#### Conclusion

There is a great need for greater international collaborations and partnerships in finding a sustainable solution to the global menace of plastic pollution thereby enhancing public health in Nigeria. Plastic pollution education is an urgent task that needs to be undertaken by passionate individuals, educationists and professionals across various communities, cities and institutions in Nigeria (Dibia, Wala, Onwuzurike, Anabaraonye & Arinze, 2023) <sup>[15]</sup>. Poetry has been discovered as a valuable tool that can be used to enhance climate change education and thus, public health through innovative plastic waste management strategies in Nigeria (Anabaraonye, Nji & Hope, 2018) <sup>[8]</sup>. Furthermore, there is a great need for more intensive research to further identify the innovative strategies to enhance awareness creation of innovative plastic waste management strategies in Nigeria.

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