International Journal of Civil Law and Legal Research

E-ISSN: 2789-8830
P-ISSN: 2789-8822
IJCLLR 2024; 4(1): 05-14
Received: 13-11-2023
Accepted: 15-12-2023

Dr. Folasade Folake Aare
Senior Lecturer and Head of Department, Private and Property Law, Faculty of Law, Anchor University, Lagos, Nigeria

Dr. Omotayo Abisoye Tekaron
Senior Lecturer and Head of Department, Public Law, Anchor University, Lagos, Nigeria

Gogo George Ntor
Lecturer 11, Department of Public Law, Faculty of Law, Anchor University, Lagos, Nigeria

Titilayo Onyemaechi Ogiri
ALecturer 11, Department of Private and Property Law, Faculty of Law, Anchor University Lagos, Nigeria

Correspondence Author;
Dr. Folasade Folake Aare
Senior Lecturer and Head of Department, Private and Property Law, Faculty of Law, Anchor University, Lagos, Nigeria

Strategic management of plastic pollution in Nigeria: Balancing best approaches

Dr. Folasade Folake Aare, Dr. Omotayo Abisoye Tekaron, Gogo George Ntor and Titilayo Onyemaechi Ogiri

DOI: https://doi.org/10.22271/civillaw.2024.v4.i1a.58

Abstract
Plastic pollution has emerged as a pressing environmental concern globally, with Nigeria grappling to manage its impacts. Nigeria has established a range of legal instruments to combat environmental issues, including plastic pollution, such as the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act and the Harmful Waste (Special Criminal Provisions, etc.) Act. However, these laws encounter obstacles that hinder their successful implementation. One key challenge is the gap between legislative intent and practical enforcement. Limited resources, inadequate monitoring, and lax compliance undermine efforts to regulate plastic production, use, and disposal. This leads to the persistence of plastic pollution, particularly evident in urban areas and water bodies. Additionally, the multifaceted nature of plastic pollution poses complexities for regulatory measures. Addressing various forms of plastic waste, such as single-use plastics and microplastics, demands tailored approaches, often resulting in fragmented strategies and confusion among stakeholders. This paper investigates Nigeria's legal framework aimed at mitigating plastic pollution, focusing on the challenges impeding its effectiveness and the potential avenues for improvement. To surmount these challenges, promising prospects exist within the legal framework. Strengthening enforcement mechanisms through enhanced monitoring and stricter penalties could bolster compliance and deter violations. Collaborative initiatives involving government bodies, non-governmental organizations, and industries can yield innovative solutions and effective implementation. By addressing obstacles, Nigeria can realize a more effective legal strategy to combat plastic pollution, fostering a cleaner and more sustainable environment for present and future generations.

Keywords: Additionally, multifaceted, government bodies

Introduction
The proliferation of plastics, characterized by their durability, versatility, and affordability, has transformed various industries and consumer habits [1]. However, the unintended consequences of plastic consumption and disposal have led to a global environmental crisis [2]. In Nigeria, the pervasive presence of plastic waste, particularly in urban areas and waterways, highlights the urgent need for comprehensive solutions. Less than 12% of plastic waste is recycled in the nation [3]. There is no current capacity for energy recovery in cement kilns or incinerators with heat recovery. About 80% of plastic waste goes to landfills and dump sites [4]. Other disposal options include open burning and landfill fires, resulting in air pollution and health hazard.

Nigeria has recognized the gravity of plastic pollution and has taken steps to address it within its legal framework. Notably, the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act serves as a cornerstone in regulating environmental matters, including plastic pollution. This Act empowers the agency to set standards, monitor compliance, and enforce penalties for environmental violations. Additionally, the Harmful Waste (Special Criminal Provisions, etc.) Act criminalizes certain hazardous waste practices, contributing to the broader efforts against plastic pollution.

Despite these legislative measures, series of challenges hinder the successful execution of Nigeria's legal framework against plastic pollution. Foremost among these challenges is the gap between the intent of the laws and their practical enforcement. Limited resources, inadequate infrastructure, and inconsistent enforcement efforts contribute to the continuation of plastic pollution. Furthermore, the multifaceted nature of plastic pollution, encompassing diverse types of plastic waste and sources, poses complexities in developing coherent and all-encompassing regulations.

Public awareness and education also emerge as significant hurdles. Many Nigerians remain unaware of the detrimental impacts of plastic pollution and lack access to information on proper waste disposal practices. This gap in understanding hampers the collective efforts needed to combat plastic pollution at its source.

While challenges persist, promising prospects for strengthening the legal framework and addressing plastic pollution are discernible. First and foremost, enhancing enforcement mechanisms through increased monitoring, stiffer penalties, and more consistent application of regulations can serve as a deterrent against violations. Collaborative initiatives involving government agencies, non-governmental organizations, and industries can contribute to the development and implementation of innovative solutions. Furthermore, the concept of extended producer responsibility (EPR) holds potential in incentivizing eco-friendly plastic production and disposal practices. By shifting the onus of waste management onto producers, EPR aligns economic interests with environmental stewardship.

The legal framework for mitigating plastic pollution in Nigeria holds both promise and challenges. While the existing laws and regulations provide a foundation, bridging the gap between legislation and effective implementation remains critical. By addressing obstacles such as enforcement gaps, complexity in regulations, and limited public awareness, Nigeria can harness its legal framework to combat plastic pollution more effectively. Through strategic improvements and collaborative efforts, Nigeria has the potential to emerge as a leader in sustainable plastic waste management, safeguarding its environment and fostering a healthier future for its citizens.

2. Environmental and Public Health Implications of Plastic Pollution

Plastic pollution has emerged as a significant and pervasive environmental challenge with far-reaching implications for ecosystems, biodiversity, and the overall health of the planet. The presence of plastic waste in oceans and other water bodies has led to the accumulation of marine debris. Large plastic items, such as bags and fishing gear, pose entanglement risks to marine life, affecting their ability to swim, hunt, and reproduce. Fragmentation of larger plastic items over time results in microplastics, tiny particles that are less than 5mm in size. Microplastics are ingested by aquatic organisms, entering the food chain and potentially causing bioaccumulation and biomagnification, which can threaten larger marine species, including marine mammals and seabirds.

Plastic pollution alters aquatic habitats, impacting coral reefs, seagrass beds, and coastal ecosystems. Plastic debris can smother coral reefs, reducing their ability to regenerate and support marine biodiversity. Plastics can leach harmful chemicals, such as bisphenol A (BPA) and phthalates, into aquatic environments. These chemicals can disrupt aquatic ecosystems, affecting the health of aquatic organisms and potentially entering the food chain.

Plastic waste has infiltrated terrestrial ecosystems, including soil. Microplastics can accumulate in soils, affecting soil health and nutrient cycling, potentially leading to reduced agricultural productivity. Terrestrial animals can mistake plastic items for food or become entangled in plastic debris [5]. Ingestion can lead to internal injuries, malnutrition, and even death, impacting various wildlife species, from birds and mammals to reptiles [6].

Plastic bag waste in landfills leaches into water sources causing soil pollution. Plastic bag waste promotes breeding ground for mosquitoes that cause malaria [7]. Plastic pollution degrades natural landscapes, marring scenic beauty and diminishing recreational values [8]. Littered areas can deter tourists and adversely affect local economies dependent on tourism. They are responsible for the clogging of water drains. Blocked water reticulation systems cause water bursts that lead to excessive loss of water [9].

Degradation of plastic items, such as packaging and textiles, releases microplastic particles into the air. These airborne microplastics can travel long distances and be inhaled by humans and animals, raising concerns about potential health impacts. Airborne microplastics can settle on land and water surfaces through atmospheric deposition. This introduces plastics into new environments and ecosystems, exacerbating the reach of plastic pollution. The production and disposal of plastic contribute to greenhouse gas emissions, exacerbating climate change. The extraction of fossil fuels for plastic production releases carbon dioxide, while plastic incineration releases additional greenhouse gases.

Plastic pollution, once thought of primarily as an environmental issue, has significant implications for public health. As plastic waste accumulates in the environment, it introduces a range of health risks to humans, from chemical exposure to respiratory problems. Plastics contain various additives, including plasticizers and flame retardants, which can leach into the environment and contaminate water sources. These chemicals have the potential to enter the human food chain and may be associated with adverse health effects, such as endocrine disruption and developmental issues. The ingestion of microplastics by marine organisms can lead to bioaccumulation in seafood consumed by humans. Studies suggest that microplastics may carry toxic substances and contaminants, posing potential risks to human health upon consumption.

Packaging materials, including plastic, can contaminate food with harmful chemicals during processing, storage, and transportation. This poses a risk to human health, as these chemicals can be ingested. Microplastics have been found in drinking water, bottled water, and even in the air we breathe, raising concerns about their potential inhalation and ingestion by humans. The long-term health effects of exposure to airborne microplastics remain a subject of ongoing research.

3. Review of Existing Legal Framework and Policy Measures

The legal framework and policy measures addressing plastic pollution in Nigeria constitute a multifaceted approach aimed at curbing the detrimental environmental and public health impacts caused by plastic waste. These initiatives encompass a range of legislative measures, regulatory actions, and policy directives aimed at reducing plastic consumption, promoting responsible waste management, and fostering sustainable practices. While progress has been made, challenges remain, necessitating ongoing efforts to enhance the effectiveness of these measures.

The legal foundation for addressing plastic pollution in Nigeria includes various laws and regulations at both federal and state levels. Key legislative instruments include:

A. Constitution of the Federal Republic of Nigeria, 1999

The Constitution serves as the fundamental law of the land, establishing its supremacy over all other laws within the country. Any law that contradicts its provisions is deemed invalid to the extent of the inconsistency. The Constitution's significance in environmental matters lies in its capacity to lay the groundwork for a legal framework that empowers citizens with legal standing and access to justice, enabling them to safeguard and enforce the preservation of a clean, sustainable environment. Section 20 of the 1999 Constitution, situated in Chapter 2 under 'Fundamental Objectives and Directive Principles of State Policies,' explicitly mandates the State to protect and enhance the environment, ensuring the preservation of Nigeria's water, air, land, forests, and wildlife.

B. National Environmental Standards and Regulations Enforcement Agency (NESREA) Act [10]

NESREA Act in Nigeria plays a crucial role in regulating various aspects of environmental protection, including issues related to plastic pollution and the use of plastic bags. The Act provides a legal framework for addressing environmental challenges and ensuring compliance with environmental standards. When it comes to plastic bags, the NESREA Act contains provisions that are aimed at reducing their negative impact on the environment and promoting sustainable practices. The Act empowers the NESREA to set environmental standards, regulate hazardous substances, and enforce compliance, including issues related to plastic pollution [11].

The NESREA Act empowers the Agency to establish and enforce regulations concerning environmental protection, which includes regulating the production, distribution, and use of plastic bags [12]. This authority allows NESREA to set standards for plastic bag materials, sizes, and proper disposal methods. Section 8 (o) provides that in coordination with pertinent agencies and subject to the Minister's approval, NESREA shall develop initiatives aimed at formulating standards and rules to prevent, mitigate, and eradicate pollution and various types of environmental deterioration in the country's atmosphere, terrestrial areas, oceans, seas, and other water sources. These initiatives shall also encompass the restoration and improvement of the nation's environment and natural resources.

Plastic pollution is implicated in air pollution. Under section 20(1), the Agency is authorized to establish regulations defining specifications and standards aimed at safeguarding and improving the quality of Nigeria's air resources. This is done to advance public health and well-being, as well as to support the natural growth and productive potential of the nation's human, animal, marine, and plant ecosystems. Section 25 provides that the Agency has the authority to enact regulations with the aim of safeguarding public health and fostering effective environmental sanitation practices.

The Federal Ministry of Environment, with its enforcement body, NESREA, has embraced the Extended Producer Responsibility (EPR) model. This adoption is driven by considerations related to economics, health, and the environment. It aligns with the National Policy on Environment which emphasizes the importance of sustainable industrial development achieved through policy measures that encourage production processes to integrate practical plans for waste reduction through material recovery and recycling, among other objectives [13]. The Act provides a basis for implementing EPR programmes for plastic bags. This approach places responsibility on manufacturers and producers for the entire lifecycle of their products, including their proper disposal and recycling. NESREA can use its authority to establish guidelines for manufacturers to manage the end-of-life impacts of plastic bags.

To date, the EPR initiative implemented by NESREA stands as the most closely aligned government policy aimed at addressing plastic waste in Nigeria. This programme, which was initially conceived in Sweden during the 1990s as a policy approach to promote environmentally responsible product manufacturing and disposal, took shape in Nigeria when NESREA released its EPR operational guidelines in 2014. Implementation officially commenced in 2016, with the food and beverage industry, which is likely the largest contributor to plastic waste in the country, being the initial focus [14].

The EPR framework aims to establish a foundation for cooperative partnerships between the government and the private sector with the ultimate goal of achieving zero waste. The fundamental concept is to hold manufacturers and brand owners accountable for every aspect of their product's life cycle, with a particular emphasis on take-back, recycling, and final disposal. This multifaceted process is collectively overseen by third-party organizations known as Producers Responsibility Organizations (PROs), exemplified by the Food and Beverage Recycling Alliance (FBRA).

Currently, the FBRA counts ten registered companies among its members. However, numerous manufacturers, who bear responsibility for generating plastic waste, have been reluctant to join this alliance. Several factors contribute to this hesitancy. Firstly, manufacturers vary significantly in their standards and capabilities, affecting their ability to adhere to the EPR guidelines and implement these new practices. Additionally, there is a notable lack of clarity on how the policy should be executed, stemming from insufficient information and ineffective communication between the government and the industry. The roles and responsibilities of stakeholders are not well-defined, and the economic costs and incentives associated with the program have not been determined. Perhaps most importantly, the process suffers from a shortage of funds for monitoring and enforcement, which has undermined its effectiveness. Nevertheless, the PROs persist in collaborating with small community-based vendors through partnerships, engaging in advocacy efforts, and conducting collection and recycling activities.

C. Harmful Waste (Special Criminal Provisions, etc.) Act [15]

The Harmful Waste (Special Criminal Provisions, etc.) Act in Nigeria is a significant legal instrument designed to address environmental issues, including the management and disposal of harmful waste materials, such as plastic bags that contribute to environmental pollution [16]. This Act includes provisions aimed at regulating and controlling the production, distribution, use, and improper disposal of plastic bags, which are a major contributor to plastic pollution.

The Act criminalizes the improper disposal of hazardous waste, which may include certain types of plastic bags that

are not properly managed after use [17]. This provision acts as a deterrent to individuals and businesses that engage in irresponsible disposal practices. The Act outlines penalties and sanctions for violations related to harmful waste, which can extend to improper disposal of plastic bags. Any individual convicted of an offense as outlined in the Act will receive a life imprisonment sentence [18]. Furthermore, any means of transportation or conveyance, including but not limited to aircraft, vehicles, containers, and any other relevant item utilized in the movement or importation of the hazardous waste; and any piece of land where the hazardous waste was deposited or discarded, shall be confiscated and transferred to the Federal Government [19].

The Act also provides for civil liability. Accordingly, in cases where harm has resulted from the presence of hazardous waste deposited or discarded in Nigerian land, territorial waters, contiguous zones, or Exclusive Economic Zones, or within its inland waterways, the individual responsible for depositing, dumping, importing, or causing the introduction of such hazardous waste shall be held accountable for the resulting damage [20].

The Act empowers regulatory agencies to enforce and oversee compliance with waste management regulations, including those related to plastic bags. These agencies may have the authority to monitor and take action against individuals or entities that violate plastic bag-related provisions [21]. The Act also provides a legal basis for prosecuting individuals or businesses that engage in activities leading to the proliferation of harmful waste, which can encompass plastic bags that are improperly disposed of and contribute to pollution.

The Act's provisions may apply to a wide range of harmful waste materials, including plastic bags. This allows for a comprehensive approach to addressing various forms of waste that pose environmental risks.

In practice, the Harmful Waste (Special Criminal Provisions, etc.) Act can serve as a legal framework to regulate plastic bags and prevent their negative environmental impacts. Regulatory agencies can use the Act's provisions to establish guidelines for the production, distribution, and proper disposal of plastic bags. By enforcing penalties and sanctions, the Act can discourage irresponsible disposal practices and encourage individuals and businesses to adopt more sustainable alternatives.

D. Lagos State Environmental Protection Agency (LASEPA)

In Lagos State, LASEPA is responsible for environmental protection and enforcement of regulations. LASEPA has instituted measures to address plastic pollution, such as the ban on the use of polyethylene bags with a thickness of less than 0.035mm in Lagos State [22]. The Lagos State Environmental Protection Agency (LASEPA) plays a crucial role in addressing environmental issues within Lagos State, Nigeria, including the regulation and management of plastic waste, including polyethylene bags. LASEPA has been actively involved in implementing measures to combat the pollution caused by polyethylene bag use in Lagos. One of its significant actions has been to enforce a ban on the use of single-use plastic bags within the state. This ban aims to reduce the proliferation of polyethylene bags and their harmful impact on the environment, particularly on land and water bodies [23]. In addition to enforcing the ban, LASEPA has engaged in public awareness campaigns to educate citizens, market traders, and businesses about the environmental consequences of polyethylene bag usage and the benefits of adopting more sustainable alternatives [24]. These campaigns emphasize the importance of responsible waste disposal and recycling practices to minimize plastic pollution. Furthermore, LASEPA collaborates with other relevant government agencies, non-governmental organizations (NGOs), and stakeholders to implement effective waste management and recycling programs [25]. By promoting waste segregation and collection initiatives, LASEPA aims to ensure the proper disposal and recycling of plastic waste, including polyethylene bags, to prevent them from ending up in the environment and causing pollution.

E. National Policy on the Environment (Revised 2016)

The objective of the National Policy on the Environment is to guarantee the safeguarding of the environment and the preservation of natural resources to promote sustainable development. Part of the Government policy statement is to: ensure the enforcement of the Harmful Waste Act (2004) and other national laws and regulations related to waste management; establish and enforce standards for sanitary waste disposal facilities in residential areas, housing estates, and public spaces in both rural and urban settings; regulate, register, and license all significant land waste disposal sites and systems; determine the use of environmentally safe and technologically sound methods for disposing of toxic, hazardous, and radioactive waste; regulate the generation of toxic, hazardous, and radioactive waste, especially those that are prohibited; foster the development of a sustainable waste management and landscaping approach to maintain a clean environment; implement and enforce legislation to ban the use of plastic bags; expand ongoing community-based waste management pilot initiatives; and secure appropriate funding for Integrated Waste Management Facility projects in selected urban areas through public-private partnerships [26].

National Policy on Solid Waste

F. National Policy on Plastic Waste Management

The most recent and comprehensive effort to promote the sustainable management of plastic waste is the National Policy on Plastic Waste Management. This policy is built upon the foundation of the National Policy on the Environment and National Policy on Solid Waste Management, which governs the waste sector. Since its inception in 2018, the policy has been under consideration and continues to evolve. The primary objectives of the policy are ambitious and forward-looking [27]. By 2025, it aims to reduce plastic waste generation in the environment by 50 percent compared to the baseline figure of 2020 [28]. Additionally, the policy aims to phase out single-use plastic bags and styrofoam by 2028, contributing to a significant reduction in plastic pollution [29]. Furthermore, it envisions that all plastic packaging in the market will be recyclable or biodegradable by 2030, fostering a more sustainable approach to plastic use and disposal.

The National Policy on Plastic Waste Management represents a significant step towards addressing the pressing issue of plastic waste in the country and promoting a more environmentally conscious approach to plastic use throughout its life cycle. As it continues to be deliberated and refined, the policy has the potential to drive meaningful

change and contribute to a cleaner and more sustainable environment for future generations. The policy aims to promote the sustainable management of plastic waste throughout the country, including Lagos and Abuja. It emphasizes recycling, reuse, and reduction of plastic bag usage [30].

In 2018, an additional effort to address the increasing issue of plastic waste emerged when a House of Representatives member introduced the Plastic Bags (Prohibition) Bill. This proposed legislation aimed to ban the utilization, production, and importation of all disposable plastic bags employed for commercial and household packaging. Furthermore, it proposed stringent penalties, including imprisonment, for those found in violation. Despite the House of Representatives approving the bill in 2019, it never received official approval to become law.

4. Prospects and Strategies for a Comprehensive Legal Framework.

Plastic pollution has emerged as a significant global environmental concern, posing serious threats to ecosystems, marine life, and human health. In Nigeria, a country with a growing economy and population, the issue of plastic pollution has become increasingly pressing. Several prospects exist with relation to having a comprehensive legal framework.

A. Heightened Environmental Awareness

Over the years, there has been a notable increase in environmental consciousness among Nigerian citizens and organizations. This heightened awareness could lead to stronger advocacy for effective plastic pollution regulations and enforcement. The heightened environmental awareness in Nigeria presents a promising opportunity to establish a comprehensive legal framework to address plastic pollution. Leveraging this awareness, strategies such as targeted public awareness campaigns, community engagement, incentives for eco-friendly practices, strengthened environmental education, partnerships with NGOs, transparency in reporting, and mandatory environmental impact assessments can drive the development and implementation of effective pollution control regulations, fostering a cleaner and healthier environment for all.

B. Government Commitment

The Nigerian government has shown some commitment to addressing plastic pollution. For instance, NESREA has proposed regulations on plastic waste management. This commitment creates an opportunity to develop and implement comprehensive legal measures. The prospects for a comprehensive legal framework on plastic pollution in Nigeria are buoyed by the commitment shown by the government. With government backing, regulatory agencies can be empowered with resources and authority to monitor and enforce pollution control measures effectively. Furthermore, government commitment enhances collaboration with international partners and organizations, facilitating the exchange of best practices and access to resources for implementing and updating pollution control policies. Overall, government commitment serves as a cornerstone for building a comprehensive legal framework that safeguards Nigeria's environment and public health.

C. Global Initiatives

The prospects for a comprehensive legal framework on pollution in Nigeria are bolstered by the alignment with global initiatives addressing environmental challenges. International agreements such as the United Nations Sustainable Development Goals (SDGs) and the Basel Convention provide a roadmap for tackling pollution. Nigeria's participation in these initiatives offers the opportunity to harmonize its legal framework with global standards, enhancing its credibility on the international stage. Leveraging these platforms, Nigeria can access knowledge, resources, and best practices to design effective and adaptable pollution control measures. Collaborating with other nations also enables the exchange of experiences and solutions tailored to local contexts. By aligning its legal framework with global initiatives, Nigeria can demonstrate its commitment to environmental protection, attract international support, and work collectively to mitigate pollution's adverse impacts.

D. Economic Incentives

Economic incentives present promising prospects for the establishment of a comprehensive legal framework on pollution in Nigeria. By integrating incentives into the framework, the government can encourage industries, businesses, and individuals to adopt environmentally friendly practices. These incentives might include tax breaks, grants, subsidies, or preferential treatment for complying with pollution control regulations. Such measures not only motivate stakeholders to reduce their environmental impact but also stimulate investments in cleaner technologies and sustainable practices. Moreover, economic incentives can foster the growth of the green economy, generating employment opportunities in sectors related to pollution control, waste management, and renewable energy. The framework's success in achieving pollution reduction goals could be bolstered by aligning economic benefits with environmental stewardship, thereby creating a win-win scenario for both the economy and the environment in Nigeria.

E. Public-Private Partnerships

The prospects for a comprehensive legal framework on pollution in Nigeria are enriched by the potential of robust public-private partnerships (PPPs). Collaboration between the government and private sector entities can amplify the framework's effectiveness. PPPs offer shared expertise, resources, and innovative solutions that can accelerate the implementation and enforcement of pollution control measures. Private sector involvement in funding, technology adoption, and knowledge sharing enhances the framework's practicality and relevance. Additionally, PPPs can drive awareness campaigns, community engagement, and capacity-building initiatives, fostering a sense of shared responsibility for pollution reduction. The framework's success depends on a multi-stakeholder approach, where PPPs leverage their collective strengths to ensure a cleaner environment and sustainable development in Nigeria. By forging strong partnerships, the legal framework can achieve its pollution control objectives more efficiently and comprehensively.

Despite the prospects, challenges still exist such as can be seen in the following:

F. Enforcement and Implementation

One of the most significant challenges in Nigeria's legal framework for plastic pollution is the enforcement and

effective implementation of regulations. Weak enforcement mechanisms and corruption could hinder the impact of well-intentioned laws [31]. Enforcement and implementation pose significant challenges for establishing a comprehensive legal framework on pollution in Nigeria. Weak enforcement mechanisms, corruption, and limited regulatory capacity undermine the framework's effectiveness. Inconsistent enforcement can lead to non-compliance by industries and individuals, perpetuating pollution. Additionally, inadequate resources for monitoring and penalties can hinder the deterrent effect of regulations. Corruption within regulatory agencies could compromise the integrity of pollution control efforts. Addressing these challenges requires strengthening regulatory bodies, investing in training and capacity-building, and promoting transparency in enforcement processes. Collaborative efforts between government bodies, civil society, and international partners can fortify enforcement mechanisms, ensuring that the legal framework translates into tangible pollution reduction and environmental preservation.

G. Lack of Infrastructure

The lack of adequate waste management infrastructure poses a significant challenge to establishing a comprehensive legal framework on pollution in Nigeria. Inadequate facilities for waste collection, recycling, and disposal hinder the proper management of pollutants [32]. The absence of efficient infrastructure exacerbates pollution problems, as improper waste handling leads to pollutants entering the environment. Establishing comprehensive waste management systems requires substantial investment in infrastructure development and maintenance. Additionally, urbanization and population growth strain existing infrastructure, further complicating pollution control efforts. Addressing this challenge necessitates government investment, public-private partnerships, and technology-driven solutions to build a robust waste management infrastructure. Only through an integrated approach can Nigeria effectively address pollution while promoting sustainable waste management practices that protect both human health and the environment.

H. Informal Sector

The presence of a sizable informal sector presents a notable challenge to establishing a comprehensive legal framework on pollution in Nigeria. The informal sector, often engaged in activities like waste collection and recycling, operates outside formal regulations. Integrating this sector into the legal framework while ensuring their livelihoods are not compromised requires a delicate balance. Informal workers often lack access to proper training, equipment, and protective measures, leading to substandard waste management practices that contribute to pollution. Formulating policies that formalize the informal sector's role, provide support for transitioning to more sustainable practices, and ensure compliance with pollution control regulations is complex. Collaborative efforts involving government agencies, civil society organizations, and informal workers themselves are essential to address this challenge and promote effective pollution management across all sectors of the economy.

I. Limited Awareness

Limited public awareness poses a significant challenge to establishing a comprehensive legal framework on pollution in Nigeria. Many individuals are unaware of the detrimental effects of pollution on the environment, public health, and overall well-being. This lack of awareness can lead to indifference and apathy, hindering the support needed for effective pollution control measures. Insufficient understanding of the benefits of a clean environment can result in resistance to regulations and non-compliance. Addressing this challenge requires widespread educational campaigns that highlight the consequences of pollution, showcase the positive impacts of pollution control, and promote sustainable behaviours [33]. Collaborative efforts between government agencies, non-governmental organizations, and the media are crucial to raising public awareness, fostering a sense of responsibility, and garnering support for the legal framework's successful implementation.

J. Resource Constraints

Resource constraints present a significant challenge to establishing a comprehensive legal framework on pollution in Nigeria [34]. Limited financial, human, and technological resources can impede the development, implementation, and enforcement of effective pollution control regulations. Allocating funds for regulatory agencies, monitoring equipment, capacity-building, and public awareness campaigns can be challenging within tight budgets. Moreover, the expertise required to draft, implement, and oversee a comprehensive legal framework may be scarce. Striking a balance between addressing pollution and other pressing socio-economic priorities becomes crucial. To overcome this challenge, innovative solutions such as leveraging international partnerships, accessing grants and funding from international organizations, and prioritizing pollution control within the national agenda can help bridge resource gaps. These efforts are essential to ensure that pollution management remains a priority despite resource constraints.

K. Cultural and Behavioural Factors

Cultural and behavioural factors present a notable challenge to establishing a comprehensive legal framework on pollution in Nigeria [35]. Cultural norms, practices, and attitudes towards waste disposal and pollution may differ across regions and communities. Changing deeply ingrained behaviours requires a sustained effort to shift perceptions and habits. Moreover, the convenience-driven culture of single-use plastics and improper waste disposal practices can undermine pollution control efforts. Developing a legal framework that aligns with these cultural dynamics while promoting sustainable behaviours is intricate. Addressing this challenge involves comprehensive public education campaigns tailored to specific cultural contexts, engaging community leaders and influencers, and fostering a sense of collective responsibility for environmental preservation. Encouraging behaviour change requires a multi-faceted approach that combines legal measures, cultural sensitivity, and targeted communication strategies to achieve the desired pollution reduction outcomes.

5. Problems Associated with Plastic Pollution in Nigeria

Plastic is one of the most widely used materials anywhere in the world [36]; especially in a developing country like Nigeria where the cheaper option is usually the most preferred option. In this case, single-use plastic is the

cheaper and most accessible form of packaging of goods and products purchased in the neighbourhood shops, markets and shopping malls. Virtually every product in Nigeria, ranging from edibles to products for household use, is packaged with plastics. There is yet no proper regulation of the use of plastics in Nigeria. As a result, users tend to dispose of the plastics anywhere they deem fit and in Nigeria, a large amount of used plastics end up on the roads, in the gutters and in water bodies. For a country with a largely unregulated use of plastics, it is even worse where there is no proper infrastructure for recycling or disposal. The mere dumping of plastic is not proper disposal as it contributes to environmental pollution. Plastics are not easily degradable products; it takes around 400 years for plastic to degrade [37] and so it is essential to dispose of it either by incineration or recycling.

In 2010, Nigeria was ranked 9th in the world for pollution of the oceans as it released an estimated amount of 0.34 million tonnes of plastic debris into the ocean [38]. This is a terrible record to hold. The use of single-use plastics has become a menace in Nigeria [39]. One is likely to see the pollution of plastics everywhere on land and in water. This leads to a number of problems that threaten the health and wellbeing of the Nigerian people. It also paints the country in bad light as a place with dirty roads and water bodies.

There are several problems that are associated with the use of plastics in Nigeria. The first problems that an observer will take note of are the littered roads, clogged gutters, polluted water bodies and the large refuse dumps that smell horribly and constitute air pollution. These environmental and air pollution are short-term effects of the use of plastics in Nigeria. The plastics littering the roads will flow into and join the ones already in the gutters, which will eventually clog the drainage systems. The long-term effect is a flooded community when the rains come [40]; which will lead to further destruction of properties, loss of life, displacement of people from their homes and a host of other problems that could have been avoided with the regulation of plastics [41].

Another problem associated with plastics pollution is the health challenges. The leaching of microplastics into water and the soil poisons the crops planted in the soil and the fish in the water. When harvested, these poisoned crops and fish has health implication on the humans that ingest them. Eventually, this could contribute to birth defects, developmental issues as well as add to the increasing number of cancer diagnosis in Nigeria [42]. From another angle, health challenges could arise from the incineration of plastics at refuse dumps. Incineration has been linked to the deterioration of mental, physical and emotional health of residents living around the area [43]. Incineration could also lead to air pollution which will cause inhalation of foreign substances. Eventually, the inhaled substances will cause health damages to the affected person.

Other than the health risks posed by plastic, the air pollution from the refuse dumps and the incineration of these dumps could be very uncomfortable for persons residing around the incineration area. It is not uncommon to find persons residing close to refuse dumps and incineration areas. For these persons, they have to live with shut windows and doors majority of the time in order to bear the horrible smell coming from the refuse dumps.

In addition, the incineration of refuse dumps contributes to the emission of greenhouse gases (GHG), which is the major factor in climate change [44]. Efforts are in top gear to hit the climate mitigation target and eliminate all unnecessary forms of GHG emissions. Improper incineration that contributes more GHG emissions will be in contravention of regulations on carbon emissions.

6. Tackling Plastic Pollution in Nigeria (Recommendations)

Having identified the dangers of plastic pollution in Nigeria, it is essential to take strategic steps to correct the damaging effects that have been caused and to prevent more damage from been done. To do this, Nigeria may need to take a cue from other countries that have successfully transitioned from the use of plastic to other sustainable means of packaging. This is essential to understand how to implement effective plastic regulations that will not produce negative results such as people being thrown out of jobs in the industry.

In Nigeria, the use of plastic is largely unregulated. There is no government enacted law that regulates the production, use and disposal of plastics [45]. The only semblance of regulation of plastic can be found in the Extended Producer Responsibility (EPR) initiative of NESREA, which is focused on achieving a zero waste society. The EPR is not entrenched in the NESREA Act and exist merely as a policy of the agency. The NESREA Act itself is primarily focused on ensuring compliance with regulations on waste management, environmental sanitation and hazardous wastes. The Act has no singe mention of regulation of plastic. The same applies to the many other environmental laws in Nigeria; they are largely focused on environmental sanitation and the protection of the environment from hazardous wastes. The only exception at the National level is, perhaps, the National Policy on Plastics Waste Management. In Lagos State, the Lagos State Environmental Protection Agency (LASEPA) has a policy on the ban of single-use plastic. However, this is just an agency policy; there is yet no enacted law with specified regulations and penalties for offenders. The case is different in other countries where the ban has been effective with enacted laws and regulations to manage or eliminate the use of plastics [46] In Rwanda, a ban on plastic bags was introduced in 2008 [47]. This ban initiated the production of environmentally friendly alternatives made from cotton and banana leafs [48]. As a result, Kigali, the capital of Rwanda, became known as the cleanest city in Africa [49].

The introduction of strict penalties will also help implement the regulation of plastics. In Kenya, a ban on the production, sale and use of plastics was introduced in 2017 [50], a violation of which can attract a fine of up to 4 million Kenyan shillings or 4 years imprisonment. This is a penalty strict enough to deter people from violating the regulations.

A plastic tax can also be introduced which will be payable by manufacturing companies of plastics. In Germany, a plastic tax has been introduced through the Single-Use Plastic Fund Act 2023 [41]. This Act requires manufacturers of certain plastics to contribute to the costs of plastic waste removal in parks and streets [42]. This will encourage manufacturers to seek other packaging means or bear the cost of waste removal. Also in Germany, consumers are required to make a deposit when they purchase certain products such as plastic bottles. When they return the plastic bottles, they will get a refund of the deposit. This is done to encourage consumers to return plastics bottles for recycling

rather than just dumping them in the refuse bin [53]. This same scheme can be adopted in Nigeria.

One other method of addressing plastic pollution is the establishment of modern-technology recycling and incineration plants. Notwithstanding the health dangers that have been associated with incineration plants, research has shown that modern-technology incineration plants which comply with emission regulations have a low or no cancer risk factor [54]. In extension, it means that there is a low or no health risk associated with modern incineration plants. Hence, proper recycling and incineration of plastics will reduce the problem of plastic pollution in Nigeria.

Another means of tackling plastic pollution is to create awareness. Many are unaware of the dangers caused by plastic pollution and so find nothing wrong in dumping their used plastics anywhere they deem fit. An awareness or enlightenment scheme can be done in indigenous languages in order to reach a larger audience including the educated and uneducated.

To attend to the problems of plastic pollution, it may be necessary to adopt the method used in climate mitigation. While it has been determined that it is essential to address the effects of climate change, it has also been found necessary to reduce the emission of carbon which caused the climate change in the first place. In the same vein, while attending to the problems caused by the unregulated use of plastic in Nigeria, efforts can be initiated to reduce the production of plastics in favour of other sustainable alternatives.

7. Conclusion

This paper has extensively discussed the situation and challenges of plastic pollution in Nigeria and has proposed recommendations which can guide the nation to become a clean nation free of plastic litters. Plastic pollution has led to clogged drainages, dirty, littered and polluted roads and lands and cases of flood.

This paper has also examined the regulatory schemes in other countries and has established that unlike these countries, there is little or no ban, regulation or penalty against the use of plastics in Nigeria [55]. It is impossible to transition from the era of single-use plastics to sustainable alternatives without the active involvement of the government. The Plastic Bags (Prohibition) Bill of 2018 is yet to be enacted into law. This enactment of this bill into law would have a lot of positive effects in the battle against plastic pollution in Nigeria.

Nigeria has an image of having dirty streets and cities. It is not rocket science to achieve clean streets and cities. This can be done like it has been in Rwanda where other bagging alternatives can be explored. Like Rwanda, it is quite easy to be identified as a clean country just by eliminating or largely regulating the use of plastics.

One major argument that could be raised against the ban of plastics is the fact that many in the plastic production industry could lose their jobs and that this will add to the already growing population of unemployed people. However, rather than use this as an excuse to continue with the problems the country is currently facing, it would be better for these companies to transition to the production of sustainable alternatives. It could also help if the recycling infrastructure is improved such that the use of plastics does not constitute problems anymore.

The United Nations Environmental Programme (UNEP) has reported that annually, about 300 million tons of plastic wastes are produced globally [56]. The amount of plastics that are either imported into or produced in Nigeria constitute a fair amount of this estimated figure. Hence, it is important to take drastic steps to regulate the plastic production and consumption industry.

Plastics are durable, versatile and affordable and so it has become a part and parcel of the lifestyle of Nigerians. Switching to environmentally-friendly alternatives may be challenging especially in terms of costs; however, what needs to be done must be done for the general good of the society.

8. References

1. Li WC, Tse HF, Fok L. Plastic waste in the marine environment: A review of sources, occurrence and effects. Sci Total Environ. 2016;567:333–349.
2. Geyer R, Jenna JR, Law KL. Production, use, and fate of all plastics ever made. Science Advances. 2017;3(7):1–5.
3. Babayemi J, Ogundiran M, Weber R, Osibanjo O. Initial Inventory of Plastics Imports in Nigeria as a Basis for More Sustainable Management Policies. J Health Pollut. 2018;8(18):11.
4. Ramaswamy V, Sharma HR. Plastic Bags–threat to Environment and Cattle Health: a Retrospective Study from Gondar City of Ethiopia. IIOAB J. 2011;2(1):1–11.
5. Ibid.
6. Geyer R, Jenna JR, Law KL. Production, Use, and Fate of all Plastics Ever Made. Science Advances. 2017;3(7):1–5.
7. Owusu-Sekyere E, Osumanu IK, Abdul-Kadri Y. An Analysis of the Plastic Waste Collection and Wealth Linkages in Ghana. Int J Curr Res. 2013;5:205–209.
8. Chitombe JW. The Plastic Bag "ban" Controversy in Zimbabwe: an Analysis of Policy Issues and Local Responses. Int J Dev Sustain. 2014;3(5):1000–1012.
9. Global Citizen. Kenya Bans Single Use Plastics from Beaches and Parks; c2019. Available from: https://www.globalcitizen.org/en/content/single-use-plastics-banned-kenya-protected-areas. Accessed 28 August 2023.
10. Mugisha J, Diiro G. Households' Responsiveness to Government Ban on Polythene Carrier Bags in Uganda. J Agric Environ Sci. 2015;4(1):216–224.
11. Jambeck J, Diiro G, Hardesty BD, Brooks AL, *et al*. Challenges and Emerging Solutions to the Land-based Plastic Waste Issue in Africa. Marine Policy. 2018;96(1):256–263.
12. National Environmental Standards and Regulations Enforcement Agency Act (No. 20 of 2007) (hereinafter 'NESREA').
13. Ibid. sections 1 and 2.
14. Ibid. section 7.
15. Uwaegbulam C, Nwannekanma B, Gbonegun V. Producers' Responsibility and Plastic Pollution Crisis. Guardian Newspapers; c2018. Available from: https://guardian.ng/property/producers-responsibility-and-plastic-pollution-crisis/. Accessed 29 August 2023.
16. Heinrich Boll Stiftung. Need to Fill the Policy Gap. 18 August 2020. Available from:

https://ng.boell.org/en/2020/08/18/need-fill-policy-gap. Accessed 1 September 2023.
17. Harmful Waste (Special Criminal Provisions etc) Act, Cap H1 LFN 2004.
18. Ibid section 1.
19. Ibid sections 2-8.
20. Ibid section 6.
21. Ibid.
22. Ibid section 12(1).
23. Ibid sections 10 and 11.
24. LASEPA (Lagos State Environmental Protection Agency). Implementation of the Ban on the Use of Plastic Bags in Lagos State; c2016. Available from: http://lasgmoes.com/downloads/lasepa-implementation-of-the-ban-on-the-use-of-plastic-bags-in-lagos-state.pdf. Accessed 23 August 2023.
25. LASEPA. LASEPA Launches Ban on Single Use, Plastic, Pet Bottles, Others. 12 February 2022. Available from: https://www.lasepa.gov.ng/ban-on-single-use-plastics/. Accessed 26 August 2023.
26. Ibid.
27. Ibid.
28. Federal Ministry of Environment (FME). National Policy on Plastic Waste Management; c2016. Available from: http://www.environment.gov.ng/images/docs/plasticpolicy.pdf. Accessed 23 July 2023.
29. Heinrich Boll Stiftung. Need to Fill the Policy Gap. 18 August 2020. Available from: https://ng.boell.org/en/2020/08/18/need-fill-policy-gap. Accessed 26 July 2023.
30. Ibid.
31. Ibid.
32. FME. National Policy on Plastic Waste Management. 2016. Available from: http://www.environment.gov.ng/images/docs/plasticpolicy.pdf. Accessed 23 July 2023.
33. Behuria P. Comparative Political Economy of Plastic Bag Bans in East Africa: Why Implementation has Varied in Rwanda, Kenya and Uganda. GDI Working Paper 2019-037. University of Manchester, Manchester, UK; 2019.
34. Herbez T, Barlow CY, Finkbeiner M. Sustainability of Single–use Plastic Bans. Sustainability. 2020;12:1–22.
35. Plastic Pollution Coalition. How Countries in Africa are Winning the Fight Against Plastic Bag; c2017. Available from: http://www.plasticpollutioncoalition.org.
36. Babayemi JO, Dauda KT. Evaluation of Solid Waste Generation, Categories and Disposal Options in Developing Countries: a Case Study of Nigeria. J Appl Sci Environ Manage. 2018;13(3):83-88.
37. Babayemi JO, Ogundiran MB, Osibanjo O. Current Levels and Management of Solid Wastes in Nigeria. Environ Qual Manage. 2017;26(3):29-53.
38. Nyathi B, Togo CA. Overview of Legal and Policy Framework Approaches for Plastic Bag Waste Management in African Countries. J Environ Public Health. 2020, 6.
39. Babayemi J, Nnorom I, Osibanjo O, Weber R. Ensuring Sustainability in Plastics Use in Africa: Consumption, Waste Generation, and Projections. Environ Sci Eur. 2019;31(60):17.
40. Dumbili E, Henderson L. The Challenge of Plastic Pollution in Nigeria. In: Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions. Elsevier; c2020. p. 3-5.
41. Amankwa MO, Tetteh EK, Mohale GT, Dagba G, Opoku P. The Production of Valuable Products and Fuel from Plastic Waste in Africa. Discover Sustainability. 2021;2:31.
42. Parker L. A Whopping 91% of Plastic isn't Recycled. National Geographic; c2018. Available from: https://www.nationalgeographic.com/science/article/plastic-produced-recycling-waste-ocean-trash-debris-environment. Accessed 29 November 2023.
43. Henderson L, Dumbili EW. Drinking and Dropping: On Interacting with Plastic Pollution and Waste in South-Eastern Nigeria. Worldwide Waste Journal of Interdisciplinary Studies. 2021;4(3):1-12. http://dx.doi.org/10.5334/wwwj.59.
44. Dumbili EW, Henderson L. The Challenge of Plastic Pollution in Nigeria. In: Letcher T, ed. Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions. Elsevier; c2022. http://dx.doi.org/10.1016/B978-0-12-817880-5.00022-0.
45. Asiedu JB. Reviewing the Argument on Floods in Urban Areas: A Look at the Causes. Theor Empir Res Urban Manage. 2020;15(1):24-41.
46. Umar N, Gray A. Flooding in Nigeria: A Review of its Occurrence and Impacts and Approaches to Modelling Flood Data. Int J Environ Stud. 2022;80(3):540-561.
47. Dibia SIC, Wala KT, Onwuzurike U, Anabaraonye B, Arinze CP. The Impacts of Plastic Pollution on Public Health in Nigeria. Int J Res Civil Eng Technol. 2023;4(1):6-10.
48. Roberts RJ, Chen M. Waste Incineration – How Big is the Health Risk? A Quantitative Method to Allow Comparison with Other Health Risks. J Public Health. 2006;28(3):261-266.
49. Astrup T, Moller J, Fruergaard T. Incineration and Co-combustion of Waste: Accounting of Greenhouse Gases and Global Warming Contributions. Waste Manag Res. 2009;27(8):789-799.
50. Henderson L, Dumbili EW. "Drinking and Dropping: On Interacting with Plastic Pollution and Waste in South-Eastern Nigeria. Worldwide Waste Journal of Interdisciplinary Studies. 2021;4(3):1-12. http://dx.doi.org/10.5334/wwwj.59.
51. Gbadamosi OA. The Role of Public Health Laws in Combating Plastic Pollution in Nigeria: Lessons from Other Selected Jurisdictions. California Western International Law Journal. 2020;51(1):184-213.
52. Danielsson M. The Plastic Bag Ban in Rwanda: Local Procedures and Successful Outcomes: A Case Study on How Rwanda Implemented a Nation-wide Ban on Plastic Bags. Master's Thesis. Uppsala University; c2017.
53. Kohls R. The Plastic Bag Debate: Lessons from Rwanda. Toronto Environmental Alliance; c2011. Available from: https://www.torontoenvironment.org/the_plastic_bag_debate_lessons_from_rwanda. Accessed 30 November 2023.
54. Bafana B. Kigali Sparkles on the Hills. Africa Renewal; c2016. Available from:

https://www.un.org/africarenewal/magazine/april-2016/kigali-sparkles-hills. Accessed 30 November 2023.
55. Behuria P. Ban the (plastic) bag? Explaining variation in the implementation of plastic bag bans in Rwanda, Kenya and Uganda. Environment and Planning C: Politics and Space. 2021;39(8):1791-1808.
56. The Act will take effect in January 2024.
57. Amthor F. Plastic tax now also in Germany – EWKFondsG (Single-use Plastic Funds Act). KMLZ; c2023.
58. Rhein S, Sträter KF. Intended and unintended effects of statutory deposit-return schemes for single-use plastic bottles. GAIA. 2021;30(4):250-256.
59. de Titto E, Savino A. Environmental and Health Risks Related to Waste Incineration. Waste Manag Res. 2019;37(10):976-986.
60. Onyekachi NS, Chukwuemeka IS. A Review: State of Plastic Pollution in Nigeria and Measures to Tackle Them. Journal of Analytical Toxicology & Environmental Study. 2022;2(1):101-110.
61. UNEP. World Leaders Set Sights on Plastic Pollution; c2022. Available from: https://www.unep.org/news-and-stories/story/world-leaders-set-sights-plastic-pollution#:~:text=Approximately%20300%20million%20tonnes%20of,landfills%20or%20the%20natural%20environment. Accessed 30 November 2023.