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# IMPACT OF CHEMICAL CONTAMINATION ON BIODIVERSITY: A LEGAL PERSPECTIVE ON CONSERVATION AND MANAGEMENT OF THREATENED SPECIES IN NIGERIA

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## Abstract

*Chemical pollution emerges as a significant and urgent threat to environmental biodiversity. Its potential impact including habitat degradation, wildlife endangerment, the accumulation of toxins within the food chain, disruptions to ecosystems, genetic mutations, alterations in reproductive patterns etcetera. The study scrutinized the extant international and national legal frameworks regulating biodiversity conservation in Nigeria, offering a dual perspective on the challenges and prospects of environmental preservation. Within the context of this perspective, the study underscores the importance of effectively addressing chemical pollution, and the imperative for coordinated efforts at local, national and international scales. Moreover, an in-depth examination of the international and national Legal frameworks for biodiversity conservation in Nigeria is undertaken. This analysis seeks to shed light on the existing mechanisms, which is put in place to mitigate the adverse impacts of chemical pollution on the biodiversity. It also evaluates the effectiveness of the extant legal frameworks in addressing the intricate challenges posed by environmental degradation. Drawing from the insights gained through this investigation, findings show that though there exists plethora of legislations for biodiversity conservation, there still appears to be a weak implementation of these laws, resource limitations and highlights the need for enhanced cross-sectoral collaboration. The paper concludes by proffering pragmatic and actionable recommendations such as canvassing for total government commitment and ensuring effective enforcement in strengthening and protecting environmental conservation in the face of chemical contamination in Nigeria.*

***Keywords:*** **Biodiversity, Chemical, Pollution, Ecosystem, Challenges**

## Introduction

Biodiversity is a global environmental issue that has created great concern for all. The rate of species extinction has been on the rise over the last few decades. Biodiversity is a concept for the variety of life in all its forms[1]. The impacts on biodiversity are quite significant, as they have enormous direct or indirect effects on most, if not all, ecosystem services [2] It is true that society has benefited from chemical use; however, chemical pollution has also been stated as one of the five main pressures that negatively affect global diversity; the other four pressures are habitat loss, the unsustainable use and overexploitation of resources, climate change, and invasive alien species. The threat of the release and discharge of chemical pollutants into the environment directly affects biodiversity and human health through bio-magnification.

Nigeria is situated in a unique geographic position in Africa and is endowed with one of the richest biodiversity in the continent[3]. Its diversity of natural ecosystems and rich and varied biological resources have global importance for the world's climate change, the development of industrial activities in terms of pharmaceutics, tourism, construction, and agriculture. In its 2012-2020 National Biodiversity Strategy and Action Plan, Nigeria has its own unique characteristics in terms of wild fauna, higher and lower floral species, and a huge collection of marine and freshwater aquatic species[4]. However, the report shows that biodiversity in Nigeria is highly threatened due to land use changes from agriculture to overgrazing, overexploitation of natural resources through extractive actors, invasive species, and environmental pollution. According to the IUCN Red List 2013, Nigeria has a total of 309 threatened species in the following taxonomic categories: mammals (26), birds (19), reptiles (8), amphibians (13), fish (60, plants (168), etc[5]

Research shows that human wellbeing is likely to be impaired in a vicious cycle on account of ecosystem service damage due to biodiversity loss such that it impacts negatively on food, water, primary production, and nutrient recycling in terms of wildlife habitat exploitation.[6] This has brought about the need to take proactive steps and find a way forward to prevent the environment from damages caused by chemical contamination on the biodiversity.

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[1] Art.2.Covention on Biological on Diversity 1992

[2] Thomas Backhaus, Jason Snape &Jim Lazorchak, "The Impact of Chemical Pollution on Biodiversity and Ecosystem Services: The Need for an Improved Understanding"<https//www.setac.onlinelibrary.com>accessed 22 March 2023

[3] Omaka Amari, *Nigerian Conservation Law and International Environmental Treaties,* (Lagos: Unique Concept:2018) p.322

[4] Federal Ministry of Environment, Federal Republic of Nigeria, National Biodiversity Strategy and Action Plan 2016-2020 <htpps://www.ng-nbsap-v2-en>accessed 3 April 2023

[5] Ibid

[6]Sandra Diaz, Joseph Fargonie, F. Stuart Chapin and David Tilman, "Biodiversity Loss Threatens Human Well-Being",<2006 Aug. 15 doi:10.1371\journal.pbio.0040277>accessed 4 April 2023

**Nature and the Concept of Biodiversity**

Biodiversity is an acronym for biological diversity and simply stands for the variety of living creatures such as animals, birds, or plants.[7] Article 2 of the Convention on Biological Diversity, (1992) defines biodiversity as 'the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems'. Another definition of biodiversity is seen as the variety of life at all levels, from genetic variation belonging to the same species through an array of species families and genera and through population, community habitat and even ecosystem level and general diversity of life.[8]

Biodiversity can be seen in different perspectives namely as:

i. Diversity of ecosystems which deals with variety of communities of organisms and their environments functioning as ecological units

ii. Diversities of species linked with the varieties of animals or plant types

iii. Genetic diversity which has to do with variety in genetic characteristics of plants or animals.[9]

Biodiversity plays an important role in the sense that plants and animals add to the beauty and richness of the earth. Failure to protect and nurture the earth will lead to several complications that would not augur well for humans and biodiversity. This is because humanity's survival is dependent on conservation of nature.[10] Study shows that activities of humans have played significant role in the devastation of the ecosystem as the massive growth in world population and changes in lifestyles brought about by economic growth and technology in the past century globally have greatly increased demands on these resources and has led to accelerating degradation and loss of nature, natural resources and biodiversity.

Pollution is defined as the introduction by man, directly or indirectly, of substances or energy into the environment that are harmful to living resources, hazardous to human health, a hindrance to marine activities including foiling, an impairment of the quality and use of water and reduction of amenities. It is also said to be man - made or man-aided alteration of the chemical, physical or biological gravity of the environment to the extent that it is detrimental to the environment beyond

[7] Adamu kyuka Usman, *Environmental Protection Law and Practice*, (Lagos: Malthouse Press Limited:2017) 141

[8] Wilson, E.O., *The Diversity of Life* (New York; Norton;1992)

[9] Ibid

[10] Patricia Birnie, Alan Boyle & Catherine Redgwell, *International Law & the Environment*, (3rd Ed New York: Oxford University Press; 2009) 583

acceptable limits.[11] Chemical pollution refers to the contamination of our environment with chemicals that are not found there naturally.[12] `

The impact of chemical pollution can affect the delicate balance of the earth's ecosystem. Cases of mining, agricultural and waste disposal have caused substantial soil pollution as the presence of heavy metals like cadmium, mercury and lead can affect soil quality and reduce the number of micro-organisms that support soil fertility.[13] The utilization of pesticides also decreases the general biodiversity in the soil. Wildlife of various species are also not left out as they face extinction. The ocean also suffers from a high level of plastics and other chemical pollution which has led to dead zones where the oxygen level in the water cannot support life. [14]Plants as a result do not grow well and transfer various diseases to humans when consumed. Instances can be seen from the Niger Delta region of Nigeria where as a result of exploitation by oil companies, the region witnesses' pollution with total petroleum hydrocarbons, heavy metals and nutrients which leads to heavy contamination in its waters, lagoons and rivers.[15]

Pollution also destroys the aesthetic, cultural and spiritual ambience of the ecosystem and thus reduces the quality of life for all. It affects poor water quality as well as inhibits enhanced food production.

In recognition of this devastating effects on the ecosystem, there arose the need to put in place conventions to prevent biodiversity loss. Birne[16] states that historically, the concern at that period was first generated by the destruction and even disappearance of wildlife and trees, though they have long been valued by humankind as exploitable natural resources, prized for their economic rather than their intrinsic value.

Overtime, ecologists have stated how eco systems could collapse if exploitation reaches a critical level thus the need for conventions and legislations be put in place to prevent such collapse. Some of these international conventions shall be examined later in this work.

**Effects of Chemical Pollution on Environmental Biodiversity**

Chemical pollution exerts a multitude of detrimental effects on environmental biodiversity. These impacts span various domains and encompass:

i. **Soil Degradation:**

One significant effect of chemical pollution is the deterioration of soil quality. Heavy metals, in particular, pose a substantial threat. These non-degradable

[11] Ikhoriale, *Environmental Law & Policy* (1998) 52 cited in Amari Omaka, *Nigerian Conservation Law*, (n3)

[12] Clientearth,<https://www.clientearth.org>stories >accessed 4 May2023

[13] Ibid

[14] Ibid

[15] Ihouma N.Anyanwu,Sebastian Beggel,Francis D. Sikoki,Eric O.Okuku,John-Paul Unyimadu & Juergen Geist, 2Dynamics"<https://doi.org/10.1038/s41598-023-40995-9>accessed 3 March2024

[16] Patricia Birnie et al , (n10) 585

substances undergo neither microbial nor chemical degradation, resulting in their accumulation in the soil. Consequently, plants absorb these contaminants, which can alter soil pH, porosity, and color, ultimately compromising soil quality. [17]

ii. **Water Contamination:**

Chemical pollutants in water have devastating consequences, leading to toxicity and severe health issues for aquatic biodiversity and other ecosystems. Activities such as oil spillages and gas flaring have been identified as major contributors to habitat destruction. The chemical properties of spilled oil not only affect soil productivity but also cause irreversible damage. For instance, a study by the United Nations Environment Programme found that the water bodies in Ogoni communities were heavily polluted with high levels of hydrocarbons, affecting both soil and marine and coastal ecosystems. [18]

iii. **Agricultural Chemical Use:**

The application of synthetic chemicals for pest, insect, weed, and fungi control has highly destructive implications for both animals and plants. As far back as the 1960s, the pesticide DDT was known to affect various animal species. The reliance on chemical inputs like herbicides and pesticides in agriculture raises concerns about environmental health, as these substances can impact soil quality, water bodies, non-target crops, and unintended pests. A pressing concern is the coexistence of modern biotechnology varieties, including genetically modified organisms (GMOs), which pose a potential threat of biodiversity contamination. [19]

iv. **Habitat Destruction:**

The destruction of habitats emerges as a leading cause of species extinction. Shrinking ecosystems deprive species of vital resources needed for their survival. This shrinkage results in the fragmentation, degradation, and elimination of natural environments. Animal migration routes become disrupted, genetic diversity diminishes, and local populations struggle to recover from diseases and other stressors, ultimately leading to gradual species decline. The elimination of one aspect of biodiversity ripples through the ecosystem, affecting interconnected elements. Over the past three decades, human activities have destroyed a staggering 43% of forest ecosystems, resulting in substantial losses of diverse forest flora and fauna, including indigenous tree species.[20]

v. **Acid Rain:**

Acid rain, characterized by the deposition of dilute solutions of sulfuric and nitric acids through rainfall, contributes significantly to environmental damage. Sulfur

[17] Clientearth (n11)

[18] UNEP, United Nations Environment Programme (2011), Environmental Assessment of Ogoni land, Reliefweb, 3

[19] Government of Netherlands "Consequences of GMOs for Biodiversity <https://www.government.nl>topics >accessed 7 June 2023

[20] Omaka, Amari, (n11), 229

oxide emissions primarily originate from coal and oil power generation, industrial processes, and smelters, while nitrogen oxide emissions stem from automobile exhaust, high-temperature combustion engines, chemical fertilizer factories, and fossil fuel combustion. Acid rain not only exacerbates air pollution but also severely impacts ecosystems, particularly trees and plants, which are integral to these systems. Acid rain's effects on trees are long-lasting, requiring centuries, if not millennia, to restore pre-disturbance levels of productivity and function. [16]

**International Legal Frameworks for the Conservation of Biodiversity**

**i. UNEP Principles of Conduct in the Field of the Environment for the Guidance of States in the Conservation and Harmonious Utilization of Natural Resources Shared by Two or More States 1978[21]**

The principles in this Convention though relevant to mineral and water resources and pollution, is said to apply to the protection of migratory species of animals and transboundary nature reserves and parks. It is worthy of note that the majority of these principles are to a remarkable degree reflected in the provisions of major wildlife conventions.

**ii. World Charter for Nature[22]**

This Charter recognizes that mankind is responsible for all species and states in its Article 1 that "Nature shall be respected and its essential processes not impaired.

Its Article 2 provides that the genetic viability on the earth shall not be compromised; the population levels of all life forms, wild and domesticated must be at least sufficient for their survival and to this end necessary habitats shall be safeguarded". It is noted that the Charter offers nothing more than general admonitions and that though the provisions contain mandatory terms like "shall", they are expressed in general terms.[23] This is so as the Charter has no binding legal status but rather has some moral and political force.[24] An important provision is Article 11which states that activities which might impact on nature must be controlled using the "best available technologies", Unique areas must be specially protected as must representatives samples of ecosystems and habitats of rare or endangered species and that eco systems and organisms used by man are to be managed to sustain optimum productivity without endangering coexisting ecosystems or species. It further states that natural resources must not be wasted but can be used as long as this does not come close to exceeding their regenerative capacity.

Article 22 recognizes the sovereignty of states over their natural resources and obligates them to give effect to the Charter through its competent organs and in co-operation with other states. Birne states the United Nations intended the Charter

[21] UNEP/12/28(1978)

[22] World Charter for Nature,< https://www.un-documents.net>wcn>accessed 6th August2023

[23]Patricia Birne et al, (n10) .604

[24] Ibid

to be a contribution to international law on conservation and that most of its provision have been reflected in UNCED Instruments as well as the Convention on Biological Diversity.[25]

### iii. The Convention on Biological Diversity1992[26]

The Convention which entered into force on 29th December 1993 is one of the most widely ratified of all environmental conventions. The preamble amongst others reaffirms that conservation of biological diversity is a common concern of human kind that states have sovereign rights over their own biological resources and that states are responsible for conserving their biological diversity and for using their biological in a sustainable manner. It incorporates the principle of sustainable development by restating its determination to conserve and sustainably use biological diversity for the benefit of present and future generations.

The objective of this Convention is to achieve an equitable balancing of interests of developed and developing countries.
Article 1 states the three main objectives of the Convention namely: conservation of biodiversity, sustainable use of its components and the fair and equitable sharing of the benefits arising from the utilization of genetic resources.
Articles 3, 4 and 5 refer to the principle where states exercise their sovereign right to exploit their resources subject to their policies with the effect that such activities do not harm the environment of other states, that the provisions of this Charter shall apply to components of biological diversity, in areas within the limits of its national jurisdiction and are enjoined to cooperate. Articles 8 and 9 lists a wide range of measures that are required to protect the diffuse elements which collectively constitute the essential elements of in situ and ex-situ diversity which include protected areas, regulation and management of biological resources both inside and outside protected areas, protection of ecosystems, natural habitats and population of species.

### Examination of Biodiversity in Nigeria.

Nigeria's well-endowed ecosystem is said to possess one of the highest concentrations of biodiversity on the planet, however unrestricted use of chemical pollutants which include pesticides, insecticides, herbicides, as well as spillages from refineries are responsible for the loss of biodiversity in Nigeria. Nigeria is blessed with a plethora of biodiversity and biological resources including plants, animals and ecosystems to the extent that some of them are threatened to the extent of extinction and degradation resulting from the imbalance between economic development and biodiversity conservation.[27]This has been further attributed to also human activities on the environment. It is estimated that that 70%-80% of Nigeria's original forest has disappeared and presently the area occupied by forests is reduced

[25] Ibid

[26] Convention on Biological Diversity United Nations 1992, <https://www.cbd.int>cbd-en >accessed 8 August 2023

[27] Anwadike B.C., Biodiversity Conservation in Nigeria: Perception, Challenges and Possible Remedies, <https://www.lupinepublishers.com> accessed 4th May2023

to 12%.[28] Study shows that though the Nigerian government established several forest reserves for conservation purposes, these forest reserves have been seriously neglected and have received little or no improvement. Crude oil exploration and exploitation also creates serious problems particularly in the Niger Delta resulting to hazards like soil degradation, deforestation, water resources degradation as well as destruction of biodiversity.[29] Nigeria is a signatory to many global conventions, protocols and treaties which are relevant to environmental and biodiversity conservation and has ratified thirty global conventions.[30] Aside this, the government has in place a plethora of legislations which span from the 1960s till date. An examination of some of them shall be examined shortly.

**Legal Frameworks for the Conservation of Biodiversity in Nigeria**

**i. 1999 Constitution of the Federal Republic of Nigeria [31]**

In recognition of the importance of the environment in Nigeria, the Federal government for the first time recognized and provided in chapter 2, Fundamental Objectives and Directive Principles of State Policy, section 20 of the 1999 Constitution as amended for environmental objectives which states as follows:

"The state shall protect and improve the environment and safeguard the water, air, and land, forest and wildlife of Nigeria".

It is noted that though chapter 2 is not justiciable by virtue of section 6(6) (c) of the Constitution, The case of *Attorney -General of the Federation of Lagos state v Attorney – General of the Federation* [32] has changed the narrative in the sense that Chapter II provisions can be made justiciable, effectual and no more dormant as mere declarations by virtue of section 4(2) Item 60(a) 2nd Schedule to the Constitution which falls under the Exclusive Legislative List and can only be legislated upon by the National Assembly with the combined reading of section 20 of the Constitution. This means that the National Assembly relying on Section 20 and Section 4(2), Item 60 (a) 2nd schedule can by enactment make the provisions in Chapter 2 justiciable and this position has also been restated in *Attorney- General of Ondo State v Attorney- General of the Federation & ors*[33] This has also been further recognized when section 20 is read together with section 24 of the African Charter on Human and People's Right[34] which has been applied in SERAC v.

[28] Bernard B. Meer, Ephraim E. Dishan, Damian Ikima & Gabriel O. Ateh, "Ecological Implications of Environmental Contaminants on Biodiversity and Eco Systems Services: The Nigerian Experience"< https://www.basicreserachjournals.org> accessed 3 May2023

[29] Nwachukwu, J., (2000) Nigeria Environment in the 20th Century, NCF 20th Anniversary Public Lecture Series No; 2, Nigerian Conservation Foundation, Nigeria.

[30] Anwadike, B.C., ( n25)

[31] 1999 Constitution as amended

[32] (2003)12NWLR (Pt833)1

[33] (2002) LPELR623,

[34] CapA9, LFN2004

Nigeria[35] and in the case of *Jonah Gbemire v. Shell Petroleum Development Company of Nigeria Ltd*[36]

**ii. National Environmental Standards and Regulations Enforcement Act 2007[37](NESREA)**

This Act is now the major law for the protection of the environment in Nigeria. Its main objective is to ensure that the environment is free from pollution and wanton degradation.[38]

Section 2 of the Act states that The agency shall, subject to the provisions of the Act have responsibility for the protection and development of the environment, biodiversity conservation and sustainable development in Nigeria's natural resources in general and environmental technology, including coordination and liaison with relevant stakeholders within and outside Nigeria on matters of enforcement standards, regulations, rules, laws, policies and guidelines.

The Agency is empowered to enforce compliance with guidelines and legislations on sustainable of the ecosystem, biodiversity conservation and the development of Nigeria's natural resources.[39] To ensure its adequate functionality, the Minister of Environment who is empowered to make regulations for the general purpose of carrying out the functions of the Agency made twenty four regulations. Some of these regulations which relate to biodiversity conservation are the National Environmental (Access to Genetic Resources and Benefit Sharing) Regulations 2009[40], National Environmental (Desertification Control and Drought Mitigation) Regulations 2011[41], and National Environmental (Control of Bush/Forest Fire and Opening Burning) Regulations 2011[42]. It is important to note that the Regulation on bush burning/forest fire is aimed at conserving forest resources where its Regulation 3 bans any person burning any forest or engaging in any activity that may cause forest fire

Section 26(1) also prohibits discharge of harmful substances upon the nation and further prohibits some specifically unfriendly acts in a forest reserve such as illegally trafficking in timber and bush burning.

It is also important to note that the Agency is to enforce compliance with the importation, exportation, production, distribution, storage, sale, use, handling and disposal of hazardous chemicals and waste other than oil and gas sector[43] This

[35] (2001) ACHPR,

[36] Unreported suit no. FHC/B/CS/53/05

[37]National Environmental Standards and Regulations Enforcement Agency(Establishment)Act CAPN164LFN 2010

[38] Ibid

[39] Section 7(e)

[40] Federal Republic of Nigeria, Regulations No. 30 of 2009, Vol. 96No. 62 Official Gazette(Abuja)dated 9th October,2009

[41] S.I No. 13, Gazette No. 40, Vol. 98 of 3rd May,2011

[42] S.I No.15,Gazette No. 42, Vol.98 of 6th May, 2011

[43] Section 7(g)

provision has been criticized based on the fact that the power given to the Agency is restrictive in terms of the oil and gas sector and can make the Agency a toothless bulldog particularly as hazardous chemicals are predominantly utilized in the oil and gas sector. It is suggested that the exception be expunged to enable the Agency expand its authority into the oil and gas sector. How effective the Act has been with respect to protection of the biodiversity leaves a lot to be desired. This is because the environment is being degraded on a daily basis.

**iv. Environmental Impact Assessment Act 1992[44]**

The Act is said to be a giant step taken by the government of Nigeria towards the conservation of biodiversity with respect to the fact that it provides for the assessment of the level at which the environment is harnessed for the participation of those to be likely affected by the decision to be taken on the preservation of the environment so as to ensure sustainability and development growth of the nation.[45]

**v. Federal Ministry of Environment**

The Ministry is the main government organ that is given the responsibility of managing the nation's ecosystem, flora and fauna. The creation is the Ministry is intended to ensure that environmental matters are adequately mainstreamed into all developmental activities in line with global practices. Since its inception in 1999, the Ministry has impacted on raising the issue of environmental consciousness in the minds of Nigerians and has focused on involving innovative strategies that emphasize the use of environmental re-engineering as a veritable tool for job creation, poverty eradication, protection of the biodiversity conservation, ensuring food security, encouraging sustainable economic development and general improvement in the livelihood of Nigerian populace and environment.

The main functions of the Ministry include carrying out desertification and deforestation programmes, pollution and waste management, climate change and clean energy, flood, erosion and coastal management, environmental standards and regulation.

Its main thrust is said to also include reclamation and rehabilitation of degraded land, biodiversity conservation and eco-tourism, effective waste management, mitigating the effects of climate change, effective environmental and governance.[46] Despite the functions given to the Ministry, it has not abated the extent of pollution on the environment.

vi. **Nigeria National Policy on Forestry 2006**

The forestry sector has been a major source of income to the economy of Nigeria.[47] Since 1822, records have shown the massive exports of forest produce from the

[44] Environmental Impact Assessment Act 1992,CapE12 LFN 2004

[45] Ijaiya, Bashir Leke, "Analytical Legal Framework on Biodiversity Conservation in Nigeria, India and United Kingdom"<https:/ /www. law journal. Info> accessed 5thMay2023

[46] Omaka, A., (n18)

[47] Ibid, p.153

country.[48] The country's forest and woody vegetation resources include the high forests and woodland. Omaka states that natural vegetation is the main repository of the genetic diversity which is crucial to improvements in agriculture and medicine as well as the sustained supply of products and raw materials to industries.

vii. **National Biodiversity Strategy and Action Plan 2004**

In 1992, at the Rio de Janeiro Conference on Sustainable Development, Nigeria became a signatory to the Convention on Biodiversity and initiated immediately the preparation of a National Biodiversity Strategy and Action Plan in 1997 and subsequently in 2004.The objective is to conserve Nigeria's biodiversity by integrating biodiversity conservations into national planning policy and decision making process. The Plan envisions that the integration of biodiversity conservation in the national programme of sustainable development will reduce poverty substantially and facilitate the growth of Nigeria biodiversity industry for the benefit of the Nigerian economy and community which is in line with the principles of ecological sustainability and social equity. Though provisions have been made with respect to forest fires, wood fuels, drought and desertification control, there however has been no specific mention of chemical pollution that affects the biodiversity and should have been expressly provided for as well.

**Viii National Biosafety Management Act 2015**

Section 2(a) of The Act provides for a regulatory framework, institutional and administrative mechanism for safety measures in the application of modern biotechnology in Nigeria with a view to preventing any potential adverse effect on human health, animal, plant and the environment. The following objectives of the agency is to Section 2(b) makes provision for the safeguard human health, biodiversity and the environment from any potential adverse effect of genetically modified organisms including food safety

Section 2(c) states that agency shall ensure safety in the use of modern biotechnology and provide holistic approach to the regulation of genetically modified organisms.

The agency is also empowered to ensure via section 22 that no person, institution, or body shall import, export, transit, carry out the contained use, confined field trial, multi-locational without the approval of the agency.

The process for application is stated in section 23 must be complied with.

Contravention may lead to fines, penalties ranging from a fine of not less than 2,500,000.00for individuals or imprisonment for a term not less than 5years or both. In respect of a corporate body, a fine of not less 5,000,000.00 and in addition, the directors or officers shall each be liable to a fine of not less than 2,500,000.00 or imprisonment for a term of not less than 5 years or both.[49]

[48] Ibid

[49] See sections35(b)(i) &(ii), see Ijaiya, B.L, "Analytical Legal Framework on Biodiversity Conservation in Nigeria, India and United Kingdom"<https://www.lawjournal.info>accessed 5 May2023

Section 39 empowers the agency's enforcement officers to enter premises, facility, laboratory, field, farm or other places or bodies, institution to take action necessary to determine compliance with the Act, conduct monitor and assess the impact of genetically modified organisms covered by the Act on human health, animal plant of the environment and to take other actions related to such matters.

Section 40 empowers the Federal High Court to hear such matters and can grant the sealing up of the said premises as well as order for remediation measures to be undertaken by the offender.

**Impact of Legislations on Biodiversity in Nigeria**

The impact of legislations in the conservation of the ecosystem is diverse and can be highlighted as follows;

i. It helps to educate and create awareness as to the importance of preserving the ecosystem in that awareness is created on the need to prevent destruction of the biodiversity of the nation's environment.
ii. Law is a potent weapon that has the force of law rather than policies which can achieve much more and be implemented effectively where government is alive to its responsibilities.
iii. Law also plays a massive role in ensuring preservation and conservation of biodiversity as it acts as a binding force to ensure compliance.
iv. Legislations contain principles that aid conservation and sustainable development and these principles like precautionary principles, polluter pays principle, principle of intergenerational equity are contained in most legislations and have become cardinal standards of environmental law.[50]

**Challenges in Protecting Environmental Biodiversity**

Efforts to safeguard the environment and preserve biodiversity have encountered several formidable challenges. These impediments hinder the effective implementation of protective measures and policies, thus threatening ecosystems and the species that inhabit them. Below, we delve into some of the key challenges:

**1. Lack of Political Will and Sincerity:**

One of the most glaring obstacles is the absence of unwavering political commitment and sincerity from governments to ensure the rigorous enforcement of environmental protection laws. Despite the existence of legislation aimed at preventing ecosystem degradation, there is a conspicuous lack of prosecution of both companies and individuals who violate these laws. The failure to hold wrongdoers accountable undermines the effectiveness of these regulations and sends a message that environmental protection is not a priority.

**2. Insufficient Public Awareness:**

Another significant challenge is the insufficient sensitization and public awareness regarding the perils of biodiversity destruction. The national media landscape in

[50] Ijaiya, B.L., (n 49)

Nigeria has not adequately focused on monitoring the status of the country's biodiversity ecosystem. The result is a dearth of information reaching the public about the critical need for conservation. As Senator Joseph Lieberman aptly stated, "Without enforcement, most of the best environmental protection lacks meaning, lacks truth, and lacks reality."[51] Research conducted has revealed that the level of awareness and understanding of the National Biodiversity Strategy and Action Plan (NBSAP) among the Nigerian populace is exceedingly low, with many remaining unaware of its existence and purpose. [52]

**3. Poverty-Driven Practices:**

Poverty represents a pervasive challenge that compels many Nigerians to rely on forests for their livelihoods. Escalating costs of food and fuel have exacerbated this reliance on forests, leading to practices that can harm biodiversity. Unsustainable resource extraction and habitat degradation driven by poverty further endanger delicate ecosystems and their inhabitants.

**4. Inadequate Staffing and Funding:**

The scarcity of manpower among forestry staff, coupled with insufficient resources, presents a substantial barrier to effective environmental protection. Well-trained foresters, forest biologists, and conservation experts are in short supply, hindering their ability to manage the country's forest reserves competently. Moreover, the lack of appropriate equipment and vehicles for monitoring and guarding these areas compounds the problem. The result is a significant gap in the capacity to protect and conserve the environment effectively.

**Recommendations**

In light of the challenges identified, the following recommendations are put forth:

**1. Continuous Education and Awareness Building:**

It is imperative to institute ongoing education and awareness programs aimed at enlightening Nigerians about the critical importance of conservation. These initiatives should emphasize the consequences of chemical pollution on the environment and biodiversity. Public awareness campaigns can be conducted through various media channels, including television, radio, social media, and community outreach programs. These efforts should be sustained to foster a culture of environmental consciousness.

**2. Incorporating Customary Conservation Practices:**

Acknowledging and respecting the customary conservation methods employed by diverse communities is essential. These practices often contain valuable traditional knowledge about preserving the environment. Collaborative efforts with local

[51]Mintz, et al, *Environmental Enforcement: Cases and Materials* (Carolina Academy Press:2007) 3

[52] Emmanuel I. Akindele, Michael C. Ekwemuka, Paul, Aperverga, et al, Assessing Awareness on Biodiversity Conservation among Nigerians: The Achi Biodiversity Target 1, National Library of Medicine, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC80390941>accessed 29 August2023

communities can help integrate these practices into modern conservation strategies, ensuring their relevance and effectiveness.

**3. Encouraging Interagency Collaboration:**

To effectively reduce chemical pollution, collaboration among relevant agencies such as the National Environmental Standards and Regulations Enforcement Agency (NESREA) and the National Biosafety Management Agency is crucial. These agencies possess the authority to enforce compliance with environmental regulations. Encouraging synergy and information sharing among them can lead to more comprehensive and coordinated efforts in combating chemical pollution.

**4. Sustained Awareness and Sensitization:**

The dissemination of information regarding the harmful effects of chemical pollution on the environment and the imperative of preservation should be an ongoing endeavor. Regular awareness and sensitization campaigns should target various demographics, from school children to adults. These campaigns should employ a multi-pronged approach, including workshops, seminars, and community engagements, to ensure a broad reach and sustained impact.

**5. Government Commitment and Enforcement:**

To foster compliance with environmental regulations and discourage chemical pollution, the government must demonstrate unwavering political will. This entails robust enforcement of existing laws and regulations, coupled with stringent punitive measures for violators. Prosecutions of individuals and organizations responsible for environmental degradation must be carried out diligently and effectively. This not only deters potential violators but also underscores the government's commitment to environmental preservation.

In summary, addressing the challenges posed by chemical pollution and safeguarding Nigeria's environment and biodiversity require a multifaceted approach. Continuous education, the incorporation of customary conservation practices, interagency collaboration, sustained awareness campaigns, and government commitment to enforcement are critical components of a comprehensive strategy to mitigate chemical pollution and ensure a sustainable future for all.

## Conclusion

Biodiversity conservation is an important and integral part of our society and efforts must be carried out by all to conserve it. Thus, addressing the challenges posed by chemical pollution and safeguarding Nigeria's environment and biodiversity require a multifaceted approach. This is more so as pollution from chemicals are a key driver of biodiversity loss. These chemicals poses a grave threat to environmental

biodiversity and if not given the necessary attention, It can lead to habitat degradation, toxicity to wildlife, bioaccumulation, disruption of ecosystems, genetic mutations, altered reproductive patterns, and the loss of critical ecosystem services. Addressing chemical pollution is crucial for the conservation of biodiversity, and it requires coordinated efforts at the local, national, and international levels. Consequently, this study canvassed that if legislations are strictly followed, it would bring about a healthy ecosystem that would impact positively on the entire nation. It is advocated that recommendations made be adopted and implemented to eliminate chemical pollution from the biodiversity in Nigeria. In all, the commitment on the part of the governmental agencies in local, state and national in the enforcement of the above recommendations are critical components of a comprehensive strategy to mitigate chemical pollution and ensure sustainability.