

APPRAISING THE SIGNIFICANCE OF TRADITIONAL KNOWLEDGE IN ENHANCING ENVIRONMENTAL LAW IN NIGERIA

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Abstract

Nigeria is continuously facing a lot of environmental challenges ranging from loss of biodiversity, deforestation, desertification, bush burning, illegal logging, illegal traffic in wildlife, soil erosion to pollution of the entire environment, among others. There exists a good number of traditional knowledge (TK) within the local and indigenous communities in Nigeria that try to protect the environment from devastating challenges it is facing. There are traditional methods of biodiversity conservation, pollution control, ecosystem and natural resources management in many parts of Nigeria that attest to the fact that TK can enhance environmental law in Nigeria. However, the existing legal framework in Nigerian has failed to recognized TK as part of the legal system for environmental protection. That is why this paper attempted to discuss the importance of TK in environmental law. Adopting the doctrinal method of research, the paper found that TK is indispensable in enhancing environmental law as it provides valuable insights into local ecosystems, sustainable resource and biodiversity management and climate change control. In many local communities in Nigeria there is profound respect for natural resources guided by spiritual and ethical, which make them richer in biodiversity than other areas under the protection of conventional legal framework. This is why several international organisations recognized the importance of incorporating TK into environmental law. It is on this basis that the paper recommended that Nigerian government should integrate TK into its environmental law by inserting some elements of TK for protection of environment into the curriculum of environmental law in Nigerian universities. Although TK is faced with many challenges such as lack of formal legal framework, insufficient collaboration between stakeholders, cultural biases, difficulty of documentation, cultural and linguistic barriers to communication and collaboration, etc., the Nigerian government can overcome these challenges and recognized the importance of TK in environmental law.

Keywords: Appraising, Significance, Traditional Knowledge, Environmental Law

1. Introduction

Nigeria is facing major environmental challenges, which includes but not limited to biodiversity loss, deforestation, desertification, pollution, soil erosion, urban waste, e-waste, etc.¹ Forest degradation through bush burning and illegal logging, illegal traffic in wildlife and environmental

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¹ Ebinoluwa Odunayo Popoola and Lateefat Adeola Bello and Wadzi Vivian Aboki, 'Utilising Customary Law and Traditional Knowledge of Indigenous Communities in Biodiversity Conservation in Nigeria' *Nigerian Institute of Advanced Legal Studies Journal of Environmental Law* (2023) 8 (1), 164-194; Suleiman Orhun Altiparmak, 'An Analysis of Nigeria's Biodiversity Governance: Policies, Institutions and Challenges' *Uskudar University Journal of Social Sciences* (2022) 14 (1) 41-67 <<https://dergipark.org.tr/en/download/article-file/228649>> accessed 30 July 2025.

conflicts are ongoing threats that call for legal intervention.² There is therefore the need to enhance Nigeria's environmental law in order to tackle these environmental problems. Traditional Knowledge (TK), as an intellectual property (IP) can enhance environmental law in various ways such as providing valuable insights into local ecosystems, sustainable resource and biodiversity management and climate change control. In many local communities in Nigeria there is profound respect for natural resources guided by spiritual and ethical precepts that embed sustainability imperatives and stewardship of natural resources within their general cultural rubric.³ It is interesting to note that TK can be found in a wide variety of contexts, including agricultural, scientific, technical, ecological and medical knowledge as well as biodiversity related knowledge.⁴ The significance of TK to the society cannot be overemphasized. It is important to all human life, but in this article, its importance to environmental law is what will be considered, especially in environmental and ecological management, biodiversity conservation, climate change control, which are also the concerns of environmental law in Nigeria. TK often emphasizes the sustainable use of the natural resources with a view to ensuring availability for future generations. Ensuring the use of natural resources for sustainable development⁵ as advocated by TK is one of the objectives of environmental law in Nigeria.

2. Conceptual Frameworks

2.1 Traditional Knowledge (TK) and Traditional Cultural Expressions (TCEs)

While there is not yet an acceptable definition of TK at the global level, World Intellectual Property Organisation (WIPO) has provided a working description of TK to mean a living body of knowledge that is developed, sustained and passed on from generation to generation within a community, often forming part of its cultural and spiritual identity. It is further understood as knowledge, know-how, skills, innovations and practices that are passed between generations in a traditional context and that form part of the traditional lifestyle of indigenous and local

² Chigonu and others, 'Illegal Logging and Environmental Impacts: The Use of Nigeria and Lessons from USA and Australia' *Journal of Environmental and Human Right* (2023) 2 (6)
<<https://www.researchgate.net/publication/369766196>> accessed 30 July 2025.

³ Tej Kumer Nepal, 'The Role of Traditional Ecological Knowledge in Environmental Stewardship: Beyond Poverty and Necessity' (2024), *Preprints.org*<[doi:10.20944/preprints202406.1838.v1](https://doi.org/10.20944/preprints202406.1838.v1)> accessed 30 July 2025.

⁴ World Intellectual Property Organization (WIPO)<<https://www.wipo.int>> accessed 30 July 2025.

⁵ Sustainable development is development that meets the needs of the present generation without compromising the ability of future generation to meet their own needs.

communities who acts as their guardian or custodian.⁶ In its narrow sense (*stricto sensu*), TK is different from Traditional Cultural Expressions (TCEs) in the sense that the former refers to knowledge as such, in particular the knowledge resulting from intellectual activity in a traditional context, and includes know-how, practices, skills and innovations, while the later may be described as the creative form (the “expression”) in which traditional culture and knowledge is embodied or expressed. For example, TCEs may include a piece of textile depicting a legend in stylized designs, a dance in which traditional costumes and masks are used, handicrafts, music, art, stories, pottery, hat weaving, etc.⁷ TK, *stricto sensu*, refers to knowledge as such, in particular the knowledge resulting from intellectual activity in a traditional context and includes know-how, practices, skills and innovations. This means that TK can be described in its narrow sense (i.e. *stricto sensu*) and in its broader or general sense (i.e. *lato sensu*). When TK is described in its general sense, it includes both the TK and TCEs. TK *lato sensu* can be described as a broad description of subject matter, generally includes the intellectual and intangible cultural heritage, practices and knowledge systems of indigenous and local communities. TK *lato sensu* embraces the content of the knowledge itself as well as its expressions. For example, the skill of hat weaving possessed by Kanuri people of Maiduguri in Borno state, Nigeria is their TK, while the hat woven with their special traditional designs is their TCEs). TK *lato sensu* or in its general sense, is the combination of both the TK itself and TCEs. Throughout this article, the term TK will be used in its general sense or *lato sensu* (i.e. to refer to both TK and TCEs)

2.2 Environmental Law

Environmental law is a collective term encompassing aspects of law that focuses on protecting the natural environment, human health and natural resources. One of the purposes of environmental law is to preserve the environment for present and future generations and ensure sustainable development.⁸ In Nigeria, Environmental law is that branch of public law which contains rules and regulations, the objective of which is the protection of the environment. Environmental law operates to regulate the interaction of humanity and the rest of the biophysical or natural

⁶ WIPO, *Overview and Key Concepts* (Lecture Notes prepared for students of DL 203, Intellectual Property, Traditional Knowledge and Traditional Cultural Expressions, Module 1, 2025, WIPO Academy, Geneva, Switzerland)<World Intellectual Property Organization (WIPO)<<https://www.wipo.int>> accessed 30 July 2025.

⁷ *ibid*

⁸ American Public University, ‘What is Environmental LAW-And Why Does it Matter?’ *Security and Global Studies Blog/American Public University* (2023)<<https://www.apu.apus.edu>> accessed 17 July 2025.

environment with the aim to reducing the impact of human activities on the natural environment.⁹ There are many aspects of TK that can help in protecting the natural environment if incorporated into environmental law in Nigeria. An aspect of environmental law that is the focus of this article is the conservation of biodiversity, forestry, marine and water management and other aspects of the natural resources. This focus will be considered in the light of the TK of local and indigenous communities that will help in conserving biodiversity and management of forestry, marine and water in form of pollution control, with specific example of some indigenous communities in Nigeria.

3. The Nexus between TK and Environmental Law

The nexus between TK and environmental law is vital in ensuring that environmental law protects both the environment and the rights of indigenous people who are the holders of TK. As earlier stated, TK is of vital significance to indigenous and local communities and it is used in numerous areas of societal/human daily life, including agricultural, medicine, music, literature and natural environment generally.¹⁰ TK and environmental law have a very complex and increasingly symbiotic relationship. TK can offer valuable insights into sustainable natural resources management and biodiversity conservation. In turn, environmental law is evolving to incorporate and protect TK, considering its potentials in addressing environmental challenges. The relationship is symbiotic in nature in that TK provides valuable insights and practices for environmental protection, while environmental law, when properly designed and implemented, can assist to protect TK and the rights of those who hold it and eventually contributing to more effective and sustainable management of the environment. There is catalogue of examples where TK are integrated into environmental planning and management. For example, the Paris Agreement includes some references to TK, depicting an increasing recognition of the importance of TK in addressing climate change.¹¹ The African Convention on the Conservation of Nature and Natural

⁹ Ifowodo Oghenero, *Environmental Law and Policies (ESM 303)*, (A Lecture Note Prepared for graduate students of School of Science and Technology, National Open University of Nigeria) <<https://doi.org/10.13140/RG.22225324166>> accessed 17th July, 2025

¹⁰ Md Uddin, 'Traditional Knowledge, International Environmental Law and Bangladesh, *Yale Journal of International Law-Online*, (2023) 48 (1) SSRN:<<https://ssrn.com>> accessed 19th July, 2025.

¹¹ Article 7 (5) of the Paris Agreement, 2016<<https://treaties.un.org>> accessed 20th June, 2025; Article 8 (j) of UNCBD.

Resources also recognizes the vital role of TK in biodiversity conservation.¹² The United Nations Convention to Combat Desertification has recognized the role of TK in desertification control.¹³

In Nigeria, TK offers solutions to environmental conditions making it highly effective for managing and adopting to specific ecosystem. For example, the Yoruba people in Nigeria, practice agroforestry, integrating trees with crops and livestock. This TK enhances soil fertility, reduces erosion and conserves biodiversity. Their sacred groves are also significant for conserving native flora and fauna.¹⁴ One of the objectives of environmental law is conservation of natural resources through prevention of pollution, promotion of responsible resource management and to foster biodiversity conservation. Indigenous people and communities have developed knowledge to improve conservation, restoration and sustainable use of natural resources which benefit them. This is why it is reported that environmental decline and biodiversity loss are less severe in many indigenous communities than in other parts of the world.¹⁵ It was asserted that governments must learn from the environmental examples set by indigenous communities, some of which have lived in harmony with nature for thousands of years. Otherwise, they risk accelerating the triple planetary crisis the world faces of climate change, biodiversity loss and pollution.¹⁶ If the damage done to the environment must be halted, TK must be promoted and integrated into environmental law of Nigeria. This TK encompasses practical ways to ensure the balance of the environment in which humans live, so it may continue to provide essential services such as water, fertile soil, food, shelter and medicine.¹⁷ Many traditional communities in Nigeria have their TK for land use and forest management systems that results in sustainable land and forest use.¹⁸

TK offers valuable insights into sustainable environmental management (which is the main focus of environmental law) and conservation practices, which are increasingly recognized for their potential to address contemporary ecological challenges. Environmental efforts and initiatives in Nigeria have failed because of a lack of consideration for TK. This is so because imposition of a

¹² Article VI (3)

¹³ Articles 3, 10, 16, 17 & 19 of the United Nations Convention to Combat Desertification

¹⁴ Ola Francis, 'The Role of Indigenous Knowledge in Environmental Conservation' <<https://www.olamidefrancis.medium.com>> accessed 19th July, 2025

¹⁵ UNEP, 'How Indigenous Knowledge can Help Prevent Environmental Crises', *Environmental Law and Governance*, (2021) <<https://www.unep.org>> accessed 20th June, 2025.

¹⁶ *ibid*

¹⁷ *ibid*

¹⁸ (n. 1)

new way of doing things on people without considering their TK.¹⁹ This is why even the United Nations (UN) has made a declaration that TK should be recognized as important aspect of environmental management.²⁰ Thus, the importance of TK and science have long been recognized in international policy as the UN, in 2012, launched the UN Decade of Ocean Science for Sustainable Development (2021-2030) known as “Ocean Decade”, with the aim to increase the participation of indigenous peoples and local communities within its programs.²¹ The Ocean Decade aims at inclusive and effective integration of ocean science, knowledge and management systems, including TK. The newly adopted Agreement under the UN Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond Natural Jurisdiction (BBNJ Agreement) contains multiple references to TK of indigenous peoples and local communities within all of its components and thus developing respectful methodologies for knowledge integration as important for the success of the treaty.²²

4. Enhancing Environmental Law in Nigeria by Integrating Traditional knowledge

Environmental law is a body of treaties, conventions, policies, rules and regulations that are designed to regulate the interaction between human beings and the natural environment. One of the main objectives of environmental law is to ensure a safe and healthy environment for present and future generations by ensuring control of pollution, resources conservation and most importantly, biodiversity conservation. Other key aspects of environmental law include but not limited to regulation of human activities that negatively impact the environment such as waste management, hunting, fishing, wild life protection, water quality standard, air quality regulation, etc. the law is therefore dedicated to protecting the natural environment from degradation caused by human activities. There are instances in many indigenous communities in Nigeria where TK are used to ensure preservation and protection of natural environment from degradation. Many traditional communities in Nigeria have developed some knowledge, skills and innovations aimed at protecting the natural environment, especially biodiversity. In many traditional communities, there are special TK for fishing, forestry, wild life conservation, water pollution control, etc., which if incorporated into Nigerian environmental law, it will enhance it. TK systems such as rain-

¹⁹ (n. 11)

²⁰ Article 31 of the UN Declaration on the Rights of Indigenous People, 2022

²¹ Mariana Caldeira and others, ‘Weaving Science and Traditional Knowledge: Toward Sustainable Solutions for Ocean Management’ *Marine Policy* (2025) 174 (1) <<https://doi.org/10.1016/j.marpol.2025.106591>>

²² *ibid*

making, sighting of the new moon before planting, protection of forest reserve, mix cropping, protection of animal species by making them indigenous animal totems to some societies and cock crow to tell time, etc. can be utilized to enhance environmental law in Nigeria.²³ It is important for Nigeria to integrate TK into its environmental law. This is because integration of different worldview such as environmental law and TK would provide a better foundation for understanding complex biological and ecological questions.²⁴ The integration and application of TK into Nigerian environmental law can help identify new ecologically and culturally important priority areas in the environment, especially the marine environment such as high sea, while also supporting a more efficient design and approach for the management of these identified areas.²⁵ For example, TK can support the designation of new marine protected areas according to specific such as cultural factors uniqueness, rarity, ecological connectivity and sustainability of reproduction, etc.²⁶ Also, in the case of environmental impact assessment (EA), TK can help evaluate the potential impacts of proposed activities on species, ecosystems and cultures both within and beyond national jurisdiction. For instance, if an activity or project is given a-go-ahead, TK can assist in monitoring its impacts, particularly within their traditional territories or fishing grounds or on culturally and socially important species that cross jurisdiction.²⁷

4.1 Importance of TK in Biodiversity Conservation

Biodiversity conservation is one of the main objectives of environmental law in Nigeria. Biodiversity conservation is the protection, preservation and management of ecosystems and natural habitats and ensuring that they are healthy and functional for the present and future generations.²⁸ Protection and management of variety of life on earth, including species, genes and ecosystems to ensure their survival for the benefit of humanity is the focal point of biodiversity conservation. TK is a cumulative body of knowledge, including beliefs, handed down through generations by cultural transmission about the relationship of living beings with one another and with their environment.²⁹ Many local and indigenous communities in Nigeria rely on the natural

²³ Izuoma Egeruoh-Adindu, 'Leveraging Indigenous Knowledge for Effective Environmental Governance in West Africa', *Beijing Law Review* (2022) 13 (4)<Doi:10.4236/blr.2022.134060>

²⁴ (n. 20)

²⁵ *ibid*

²⁶ *ibid*

²⁷ *ibid*

²⁸ Vedant Sakrel, 'Conservation of Biodiversity' (2025)<<https://www.vendant.com>> accessed 20th June, 2025.

²⁹ Madhav Gadgil and Fikret Berkes and Carl Folke, 'Indigenous Knowledge for Biodiversity Conservation', *Biodiversity: Ecology, Economics, Policy* (1993) 22 (2/3), 151-156<<https://www.jstor.org/stable/4314060>> accessed 20 June, 2025.

environment for sustenance and have come to use a wide variety of plants and animals to meet those needs. They make significant contributions to society through their TK and innovative practices of conserving the biodiversity, which they rely on for sustenance. TK in form of traditional management system contribute to the conservation of biodiversity by the use of great number of varieties, species and landscape patches and by monitoring and responding to climate change.³⁰

It is settled that TK also includes traditional beliefs and practices. Therefore, the practice of protection of sacred groves and the observance of taboos related to certain species by some communities in Nigeria can contribute to biodiversity conservation. Many sacred groves or sacred forests in Southern part of Nigeria are now recognized as important conservation sites characterized by rich and varied biodiversity.³¹ Some of these sacred groves include the Osun-Osogbo grove, Igbole, Igbo-Olodumare, Igbo-Oba, etc. all in Southern part of Nigeria.³² These groves/forests remain rich in biodiversity because of cultural practices that consider them as sacred. Tree felling within many groves in Nigeria is regarded as an abomination and sacrifices must be offered before any tree is felled because certain trees are considered as sacred as the gods and spirits of the land and communities are said to live in their trunks. Examples of such trees are Iroko tree (*Milicia excels*) and Cotton tree (*Ceiba Pentandra*).³³ The baobab tree (*Newbouldia laevis*) is commonly cited near villages and family shrines and serves as sacrificial trees, some species of plants are believed to have the power to ward off evil spirits, such as cocoyam species (*Cococasia esculenta* and *Xanthosoma mafaffa*).³⁴ The prevalence of groves and sacred forests aids in the conservation of flora and fauna.³⁵ The seasonal movement of the Fulani herdsmen in Northern Nigeria and their animals from one location to another will allow pasture to regenerate and as such, control biodiversity loss.³⁶ If these practices are incorporated into environmental law in form of customary environmental law, it can strengthen biodiversity protection. For example,

³⁰ (n. 6)

³¹ (n. 1)

³² J. C. Onyekwelu and others, 'Biodiversity Conservation in Rainforest Zone of South-West Nigeria', *Journal of Tropical Forest Science* (2014) 26 (1), 5-15.

³³ S. O. Jimoh and others, 'The Role of Traditional Laws and Taboos in Wildlife Conservation in the Oban Hill Sector of Cross River National Park (CRNP)', *Journal of Humanity and Ecology* (2012) 39 (3), 209-219.

³⁴ (n. 1)

³⁵ A. Rim-Rukoh and others, 'Traditional Beliefs and Conservation of Natural Resources: Evidence from Selected Communities in Delta State, Nigeria', *International Journal of Biodiversity and Conservation*, (2013) 5 (7) 426-432.

³⁶ Floodplain of Western Province-Zambia, *International Journal of Research in Geography* (2024) 10 (1), 01-11<DOI.<https://doi.org/10.20431/2454-8685.1001001>>

studies in India and Nigeria found that sacred forests were richer in biodiversity than other conventionally protected sites.³⁷ It is argued that the major benefit of TK in any subject, especially with natural environment is the holistic approach it brings to solutions, which mostly encompass spiritual, cultural and practical elements that promote a harmonious relationship between human and nature generally.³⁸ TK is very important in sustainable resource management. For instance, TK often emphasizes the sustainable use of natural resources, ensuring their availability for future generations. This knowledge includes techniques like crop rotation and agroforestry.³⁹ The Yoruba people in Nigeria practice agroforestry, integrating trees with crops and livestock. This practice enhances soil fertility, reduces erosion and maintains biodiversity.⁴⁰ Holders of TK often have a deep understanding of local biodiversity, including knowledge of species' medicinal, nutritional and ecological value, which can aid in the preservation of endangered species and ecosystems.⁴¹ TK can also conserve some species of animal, birds and fishes. Some specific examples of TK in Nigeria that can enhance environmental law includes fishing and hunting techniques in a way that preserves the species from going into extinction. Some TK in Nigerian communities have customs that prohibit fishing in certain creeks that are regarded as sacred to some deities.⁴² For instance, in Shafarun community in Numan Local Government Area of Adamawa State, Nigeria, fishing activities are regulated by TK such that the people will only fish once in a year, when the rivers and lagoons are open for fishing by the community leaders. Anyone who fishes before the period declared by the leaders for fishing, will be met with serious spiritual consequences. There are other TK relating to agricultural practices and sciences such as local irrigation system for continues farming throughout the year.⁴³ Some TK are crucial in detecting changes, which allows for prompt and timely initiatives. Through certain beliefs and taboos, TK inadvertently protect biodiversity. Some of these beliefs include the prohibition of unauthorized entrance into and hunting activities

³⁷ S.A. Bhagwat and C. Rulte, 'Sacred Groves: Potential for Biodiversity Management', *Frontiers in Ecology and the Environment* (2006) 4 (10), 519-667<[https://doi.org/10.1890/1540-9295\(2006\)4\(519:SGPFBM\) 2.0.CO;2](https://doi.org/10.1890/1540-9295(2006)4(519:SGPFBM) 2.0.CO;2)>

³⁸ (n. 11)

³⁹ *ibid*

⁴⁰ *ibid*

⁴¹ *ibid*

⁴² (n. 1)

⁴³ Nneka Chioma Ezedum, 'Protection of Traditional Knowledge and its Relevance to National Economic Growth and Development in Nigeria', *The Nigerian Judicial Review* (2022) 17 (1), 88-108<<https://doi.org/10.56284/tjnr.v17i1.29>>

in some forests regions.⁴⁴ Some of these practices that promote and foster sustainable land use and natural resource management, such as agroforestry, shifting cultivation, and controlled burning have been utilized over the years to preserve soil fertility and prevent over exploitation of natural resources.⁴⁵

There are traditional rules on environmental hygiene such as where communities had specific sites designed for waste disposal. Scavengers such as vultures are protected in certain communities and these in turn play a valuable role in waste management and control.⁴⁶ Other TK that help in wildlife conservation include those ones that prohibit hunting, killing, consumption and/or trade of certain species of wildlife. Some of the taboo animals identifies in various ethnic communities in Nigeria include the crocodile (*crocodilus* sp.), the royal python (*python regius*), the West African Rock python (*python sebae*), minotor lizard, leopard (*pandera pardus*), shark (*isurus oxyrinchus*), African fish eagle (*haliaetus vocifer*), etc.⁴⁷ Some traditional communities prohibit fishing of fingerlings to avoid the extinction of species of fishes.

4.2 TK of Pollution Control

TK can help in controlling pollution of any kind that threaten the environment. For example, some ethnic communities in Eastern and Northern Nigeria have rules against the use of poisonous herbs, chemical and explosive in the harvesting of fish in streams and rivers.⁴⁸ Some communities prohibit immature catches; forbid fishing at particular periods or limit fishing to specific seasons or prohibit fishing in some particular creeks and rivers with the intent to control pollution of such water. TK can control pollution by promoting sustainable practice and management of natural resources such as traditional farming skills like crop rotation, organic cultivation and rain water harvesting, which can be used instead of using synthetic pesticides and fertilizers, reducing agricultural runoff and soil contamination. Historical evidence in Calabar-South Local Government Area of Cross River State, Nigeria shows how water is being conserved using

⁴⁴ One Health and Development Initiative, Indigenous Knowledge and Biodiversity Conservation, a paper presented at Open Wing Alliance (OWA) Africa Summit, 2024<<https://onehealthdey.org/onehealthclubs.>> accessed 24 June, 2025.

⁴⁵ *ibid*

⁴⁶ (n. 1)

⁴⁷ *Ibid*: S.C. Ihinmikaiye and others, 'The Use of Myths and Taboos in Wildlife Conservation: The Case of Bayelsa-East Senatorial District of Nigeria', *The Zoologist* (2022) 20 (1), 141-149<<https://doi.org/10.4314/tzoo/y20il/18>>

⁴⁸ (n. 1)

sophisticated techniques to avoid runoffs that will likely pollute the environment.⁴⁹ Communities have employed diverse methods such as traditional irrigation systems, rainwater harvesting and the use of natural indicators to manage water resources sustainably. Also, traditional waste management practices, such as composting and recycling can be incorporated into modern systems to minimize landfill waste and promote a circular economy. It is common in Western part of Nigeria to find food and yard waste recycled to prepare animal feeds or another form of processed food, instead of dumping them in the environment. For instance, the processing of yam peels, cassava peels, farm weeds, excess fruits from farmland, etc. to feed domestic animals or even use them as manure, can help control pollution of the environment.⁵⁰ In Adamawa State of Nigeria, animal faeces are collected, dried and spread on farmlands as manure instead of dumping them in the rivers or other parts of the environment that will cause pollution. It is also common TK in Nigeria to compost organic wastes from food, farmland, animal faeces, dead plants and animal and use them as manure.⁵¹ Animal bones, horns and tusks are recycled into useful materials such as traditional musical instrument, plates, flutes, ivories and decorating materials. All these TK of waste management can prevent pollution of the environment. The back of plantains, banana and cocoa pods are used to make black soap. Coconut shells are used as cooking fuels, while its leaves are used for jewellery parts. Palm remains/extract obtained during oil production are used for cooking fuel or blacksmithing fuel in the Southern part of Nigeria. Palm leaves are also used for weaving baskets and brooms, instead of dumping them in the environment to pollute it.⁵² There are taboos that prohibit not washing in or near the river or streams, lactating mothers are not allowed to come to water points, preventing overfishing by making some waters sacred and throwing objects into water bodies. All these are meant to prevent marine pollution.⁵³ The creation of embankments round buildings and digging of deep pits or holes very close to houses in the Niger Delta, Nigeria, are also used as a coping strategy against flooding thereby preventing eventual pollution of the marine environment by runoff water.⁵⁴

⁴⁹ Uquetan I. Uquetan and others, 'The Impact of Indigenous Knowledge on River Basin Management in Calabar-South LGA, Cross River State, Nigeria', *Socialscientia Journal of the Social Sciences and Humanities* (2024) 9 (2), 17-27 <<https://journals.aphriapub.com/index.php/ss>> accessed 23rd July, 2025.

⁵⁰ L.T. Ajibade, 'Indigenous Knowledge System of Waste Management in Nigeria', *Indian Journal of Traditional Knowledge* (2007) 6 (4), 642-647.

⁵¹ *ibid*

⁵² *ibid*

⁵³ (n. 19)

⁵⁴ Onwuemele Andreew, 'Documenting Indigenous Knowledge of Climate Change, Coping and Mitigating Mechanisms: The Case of the Niger Delta, Nigeria', *Developing Countries Studies* (2018) 8 (11), 42-48.

4.3 TK of Climate Change Control

TK holders in Nigeria can forecast weather and mitigate natural disasters such as flooding, draught and wildfire. TK has been globally recognized as an important source of knowledge on climate change mitigation and adaptation.⁵⁵ TK such as changes in plant and animal behavior and sacredness of geographical places, have been useful in seasonal climate forecasting and mitigating climate change in Nigeria, even before the adoption of modern scientific knowledge.⁵⁶ For example in Nigeria, the croaking of frogs indicates the start of the rainy season. Farmers use the behavior of frogs to prepare for a better farming season because when frogs croak throughout the night, it means there will be heavy rainfall in a few days. If frogs are not heard croaking from October to November, it indicates late rainfall that year and this helps farmers to choose drought tolerant crops, giving better yield and protecting the environment.⁵⁷ The sacredness of forest is an identified method of conserving and managing forest resources. Such practices have preserved and conserved the ecosystem, which is vital in mitigating climate change. Taboos and myths are central in managing climate change risks and disasters across many indigenous and local communities in Nigeria.⁵⁸ The use of traditional pest control methods can reduce reliance on harmful chemical that cause annihilation of animal and plant species.⁵⁹

In the Niger Delta region of Nigeria which is highly susceptible to adverse environmental changes, TK has been used to mitigate the effect of climate change on the environment.⁶⁰ In of the communities, there are individuals who possess some TK to control either excessive rainfall or drought. This rainfall control system is used once in a while in the event of extreme weather event such as drought or excessive rainfall in their communities.⁶¹ Other communities, in order to survive severe violent storm, have been making ridges on their farms to control the impact of erosion and runoff. They also plant tall trees that serve as windbreakers and erosion control because the tap roots of the trees help to hold the soil together. This practice of tree planting can go a long way in controlling climate change that warms the globe.⁶²

⁵⁵ Mafongoya, P. & Ajayi, O., 'Indigenous Knowledge Systems and Climate Change Management in Africa' CTA

⁵⁶ (n. 19)

⁵⁷ Mututi, T. & Maphosa, R. 'Indigenous Weather Forecasting: A Phenomenological Study Engaging the Shona of Zimbabwe', *The Journal of Pan African Studies*, (2012) 4 (1), 102-112.

⁵⁸ (n. 19)

⁵⁹ *ibid*

⁶⁰ (n. 52)

⁶¹ *ibid*

⁶² Anthony Kola-Olusanya, 'Indigenous Knowledge and Climate Change Risks among Smallholder Farmers: A Case Study from Southern Nigeria', (A conference proceedings of the 12th International Conference on Sustainable

TK offers valuable insights into the effects of climate change on the environment. It will complement broader-scale scientific research with local precision and nuance. Observations of indigenous and local communities and interpretations of meteorological phenomena have guided seasonal and inter-annual activities of those communities for long time. This TK contributes to the general understanding of climate change by offering observance and interpretations at a much finer scale with considerable temporal depth. It also often highlights elements that may not have been considered by climate scientists. TK has developed coping strategies to deal with unstable environments and in some cases, are already actively adapting to climate change impacts. TK can provide an invaluable basis for the development of adaptation and natural resources management strategies in response to climate change.⁶³

4.4 Ecosystem and Environmental Management by TK

TK enhances environmental law through the management of ecosystem, which includes the management of forest, marine and water.⁶⁴ For example, the use of traditional area-related restrictions to facilitate the recovery of marine resources, the use of traditional forest-related knowledge in monitoring, assessing and reporting on forest, and the use of traditional water management solutions to ensure water sustainability.⁶⁵ TK in water management includes sophisticated techniques for water conservation, quality monitoring and seasonal forecasting often integrated into their cultural practices and rituals.⁶⁶ The TK of local communities on the cultural, spiritual, social and economic value of plants can be of immense use to the humankind. Therefore, the TK of ecosystem of local communities is not confined to mere sustenance only since the communities depend upon biological resources for their spiritual, religious and cultural needs too.⁶⁷

5. Challenges of Integrating TK into Environmental Law in Nigeria

Factors such as lack of recognition of TK by the government authorities, insufficient collaboration between stakeholders, cultural biases, lack of formal legal framework on TK, difficulty of

Development, held at New York City, USA from 19th to 21st September 2024)<<https://ic-sd.org>> accessed 26 June, 2025.

⁶³ D.J. Nakashima, and others, *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation* (UNESCO, Geneva 2012) pp. 6-7<<https://unesdoc.unesco.org>> accessed 30 July 2025.

⁶⁴ (n. 5)

⁶⁵ *ibid*

⁶⁶ (n. 48)

⁶⁷ T. Ravishankar, 'Traditional Knowledge and Conservation of Biodiversity for Sustainable Livelihoods by Tribal Communities in Southern India' *Food and Agricultural Program*, (2003)<<https://www.fao.org>> accessed 23rd July, 2025.

documentation, cultural and linguistic barriers to communication and collaboration and limited funding hinder the effective integration of TK into environmental law in Nigeria.⁶⁸ There is no evidence of a formal legal framework such as sui generis legislation that will protect TK, which leaves TK susceptible to exploitation by third parties. TK is also often orally passed down through generations and not documented. This practice is subject to alterations of TK.⁶⁹ Cultural and linguistic barriers limit the incorporation of TK into environmental law in Nigeria. TK is deeply embedded in specific cultural context and often uses unique language and conceptual frameworks that may not align with modern scientific or legal systems. This can lead to misunderstandings, difficulties in communication and a lack of appreciation of the value of TK in environmental law. This factor may lead to lack of public awareness of the importance of TK to environmental law.⁷⁰ It is unfortunate that the Nigeria intellectual property law failed to protect TK. TK does not fit into the existing legal framework in Nigeria, making it prone to adoption by unauthorized individuals or even nations. If the TK in Nigeria is not protected, other countries of the world can adopt it and fit it into their environmental law.⁷¹ Protection of TK will encourage local communities to develop new innovations for the conservation of biodiversity and climate change control because the communities will derive some economic benefits from the use of their TK. If the local and indigenous communities know that they will be rewarded for using their TK to conserve biodiversity or for any other environmental purposes, they will gladly improve on their existing TK for environmental protection.

6. Conclusion

Traditional Knowledge (TK) in Nigeria covers traditional beliefs and practices, which can significantly enhance environmental law by providing strategies for sustainable environmental management. TK can promote biodiversity conservation and foster community participation in environmental protection. Therefore, integrating TK into Nigerian environmental law can give rise to effective environmental policies and ensure better compliance with the provisions of environmental law for long-term sustainable development in Nigeria. Several international

⁶⁸ (n. 49)

⁶⁹ Ogheneteme Annabel Ormigho, 'Protecting Indigenous Knowledge and Traditional Medicine Under Intellectual Property Law in Nigeria' *Mondaq* (2025)<<https://www.mondaq.com>> accessed 23 July, 2025.

⁷⁰ (n. 49)

⁷¹ Richard, U. and others, 'The Need for Protection of TK under Nigerian Intellectual Property Framework', *Journal of Customary and Religious Law* (2025) 2 (1), 16-22.

communities including the UN have recognized the importance of integrating TK into environmental law for sustainable development. The UN Declaration on the Rights of Indigenous Peoples recognises that respect for indigenous knowledge, cultures and traditional practices contribute to sustainable and equitable development and proper management of the environment.⁷² Though scientific knowledge is central to sustainable development, it is increasingly accepted that science does not constitute the only form of knowledge, and that TK also plays an important role in addressing sustainable development.⁷³ The use of TK for sustainable development, pollution control, biodiversity conservation and climate change control are indicative that TK has a close nexus with environmental law. This is because the main objective of environmental law is to protect the environment by regulating all human activities that negatively impact the environment. In the course of the research it was found that TK can enhance environmental law in Nigeria in various ways, such as providing valuable insights into local ecosystems, sustainable resource and biodiversity management and even climate change control. Although TK is faced with many challenges such as lack of formal legal framework, insufficient collaboration between stakeholders, cultural biases, difficulty of documentation, cultural and linguistic barriers to communication and collaboration and limited funding hinder the effective integration of TK into environmental law in Nigeria. But all these challenges can be overcome by the government. Despite the challenges, it is observed that in many local and indigenous communities in Nigeria, there is profound respect for natural resources guided by spiritual and ethical precepts that embed sustainability imperatives and stewardship of natural resources within their general rubric. That is why studies have shown that the Nigeria local communities are rich in biodiversity than those areas protected by conventional legal system. It is on the basis of this that it is recommended that TK be incorporated into environmental law in Nigeria. The government can do so by providing a formal legal framework in form of *sui generis* to protect TK as doing so will provide economic benefits and encourage the local and indigenous communities to improve on their TK for protection of the environment. Some fundamental elements of customary law that protect the environment should be inserted into the curriculum of environmental law in Nigerian universities.

⁷² (n. 6)

⁷³ *ibid*