



ASSESSMENT OF ENVIRONMENTAL AUDITING OF FISHERY RESOURCES IN NIGER DELTA, NIGERIA

AGHUGHU A. ADOLPHUS¹, D.U SANGARI², A.T OGAH³, M. ALKALI⁴
^{1,2&3}Department of Geography, Faculty of Environmental Science, Nasarawa State University, Keffi. ⁴Department of Environmental Management, Faculty of Environmental Science, Nasarawa State University, Keffi.

Abstract

This study assess environmental Audit on Fisheries resources in the Niger Delta. The study used both primary and Secondary Sources of data. The findings of the research revealed that there were no strong institutions for Overall Coastal Artisanal Fishery Management with appropriate Policies, Plans and Strategies, legal and institutional framework to achieve the sustainable and integrated use of coastal resources, taking into account the fragility of coastal ecosystems and the finite nature of their natural resources, and the needs of coastal communities. Over times, fishing may cease to be a major source of food for humanity and a provider of employment and economic benefits to those engaged in this activity not minding the fact that aquatic resources are not infinite and need to be properly managed. There is lack of State policies, plans & strategies for monitoring and enforcement of legislations on fisheries resources, except for community Artisanal fisheries and Fishermen's organisations practising an exclusive rights-based regime where Fisheries resources could not sustain an often-uncontrolled increase of exploitation. Oil spills pollution remains the greatest threat to sustainable and responsible artisanal fishery in the Niger-Delta. Pollution and degradation of coastal and marine areas (SDG 3-pollution and erosion) impacted negatively on depleting fishery resources (SDG 14-Life below water).The United Nations Convention on the Law of the Sea adopted in 1982 provides for better management of marine resources giving coastal States rights and responsibilities for the management and use of fishery resources within their domain through Strong institutions-- SDG 16 to monitor/ enforce coastal environmental compliance and code for responsible fisheries for sustainable artisanal coastal fishery. Fisheries resources could not sustain an often-uncontrolled increase of exploitation. Artisanal fisheries authorities should

ensure pollution, waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques

Keywords: *Environmental, Audit, Fisheries, Resources, Delta*

Introduction

Environmental issues are of great interest to the public as they affect all areas of life. Engaging in an environmental auditing requires identifying issues that really matter to people and crucial to achieving the Sustainable Development Goals (SDG)/2030 Agenda. Nigeria has a coastline of approximately 853km facing the Atlantic Ocean; terrestrial zone is about 28,000 km², whereas the continental shelf is about 46,300km². This coastline lies between latitude 4° 10' to 6° 20' N and longitude 2° 45' to 8° 35' E. The Nigerian coast is composed of four distinct geomorphology units namely the Barrier-Lagoon Complex; the Mud Coast; the Arcuate Niger Delta and the Strand Coast. In 1956, Royal Dutch Shell discovered crude oil at Oloibiri, a village in the Niger Delta, and commercial production began in 1958. Today, there are about 606 oil fields in the Niger Delta, of which 360 are on-shore and 246 offshore" (https://www.researchgate.net/profile/Peter_Nwilo, May 2005). Shell was responsible for 14,000 tons of crude oil in the Niger Delta, more than 7,000 spills between 1970-2000. Ultimately, it led to the 26 million pounds fine for Shell that occurred 30 years later (George Ibenegbu May 31, 2017) and requires about 30 years to clean up the mess. The UNEP report in 2009 revealed that oil spillage polluted 1,000 square kilometres areas in the Niger Delta, conditions not ideal for living. Spillage sources -Pipeline and tanker incidents (50%), Sabotage (28%), Oil production operations (21%), and non-function equipment (1%).

Fish provides nutrients and micronutrients that are essential to cognitive and physical development, especially in children and are an important part of healthy diet. The right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resources. Fisheries management should promote the maintenance of the quality, diversity and availability of fishery resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development.

The Study Are

Location

The Niger Delta is located in the Atlantic coast of Southern Nigeria and is the world's second largest delta Kadafa (2012). The Niger Delta area has a coastline that extends for about 450 km in the east-west stretch Agbeja (2010), Kadafa (2012). Its geographic location is between Aboh at 5° 33' 49" N, 6° 31' 38" E in the North and Palm point (4° 16' 22" N, 6° 05' 27" E) in the South. The east to west limit is between Benin River estuary (5° 44' 11" N, 5° 3' 49" E) in the west and Imo River estuary (4° 27' 16" N, 7° 35' 27" E) in the east Agbeja (2010). The Niger Delta Region lies roughly over an area of 112,100 square kilometres, and holds about 12% of the total land area of Nigeria (Igben, 2014). The region is bordered in the south by the Atlantic Ocean and to the east by the Republic of Cameroun. To the west, the region is bordered by the southwestern states of Lagos, Ogun and Osun. The states of Benue, Kogi, Enugu, Ebonyi and Anambra border the region to the north (Igben, 2014). It extends along the coast from the river's basin in the west of Bonny River with characteristic extensive interconnection of creeks. It is the most important drainage feature of the Niger Delta Basin River system with about 2% of the surface area of Nigeria.

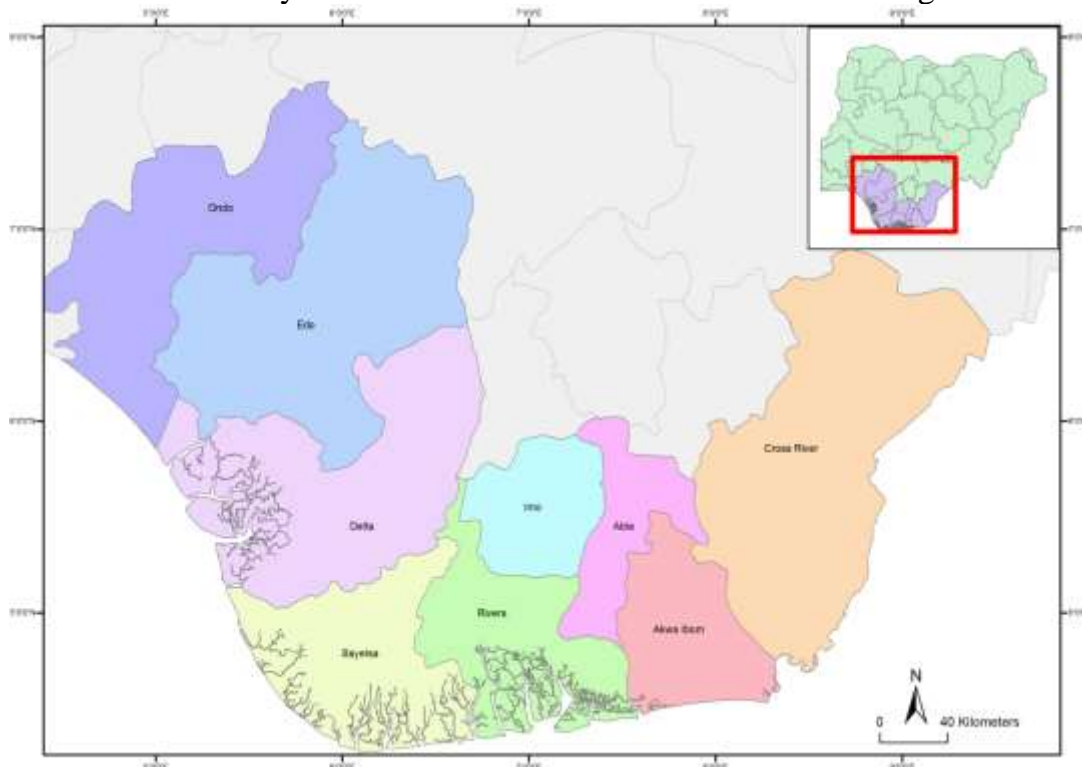


Fig. 3.1 Nigeria showing Niger Delta Region

Source: AGIS, 2020

Materials and Methods

Sources of Data

Data for this audit were derived from primary and secondary sources. Of particular importance was the primary source of data as far as this audit was concerned, because of the originality of such data from the respondents. Secondary data on the other hand were collected from relevant literatures, journals, magazines, papers (articles), online publications, and other research works.

Data Analysis

The data collected were analysed using descriptive statistical techniques of frequency and %ages to see the distribution of responses to the issues raised.

Result and Discussion

Fishery Resources Environment and Fishing Methods

Fishery Resources

During the investigation, it was found that fishery resources abound in the study area that consists of Delta and Edo states. The fishery resources identified include local streams, rivers, ponds, both big and small, and other water bodies created by the fishermen, for the purposes of fishing activities (Table 4.1).

Table 4.1: Uses and Sources of Fishery Resources

Use	Frequency	Percentage (%)
Ponds	45	22.5
Streams	80	40
Rivers	66	33
Others	9	4.5
Total	200	100

Source: Fieldwork, 2020.

From Table 4.1 it is very clear that the dominant sources of water for fishing activities in the study area are the streams, rivers and ponds. Streams and rivers abound in the study area and so present themselves easily as sources for fishing activities. Ponds appear to be significant water sources for fishing in the study area, especially in the northern parts of Edo State. The other sources, which account for 4.5 %, are mainly the boreholes and local wells that are also utilized in fish production by small scale fishermen who raise fish at the back of their homes, both for domestic and commercial reasons.

The number of cases in Table 4.1 was 200 as against the number of fishermen investigated (Table 2) and this was because Table 4.1 was on the number of

uses of sources of fishery resources rather than the number of users, Thus, individual fishermen were found to have used more than a source and this accounts for the 200 cases of uses rather than 117 fishermen.

The streams and rivers in the study area are perennial in nature and so present no difficulties or limitations to fishing activities throughout the year. This suggests that as far as sources of water for fishing are concerned, they are sustainable and thus present sustainable fishing practices.

It is important to stress the fact that water meant for fishing correspond with water for domestic uses (Table 4.2).

Table 4.2: Sources of Domestic Water Supply

Source	Frequency	Percentage (%)
River	26	22.2
Well	21	18.0
Community Borehole	39	33.3
Personal Borehole	26	22.2
Others	5	4.3%
Total	117	100

Source: Fieldwork, 2020.

The implication of using the same sources of water both for domestic and fishing purposes is that they have to be used in a manner devoid of harmful practices. For example, the application of chemicals by fishermen for easy fish harvest can have the tendency of polluting water sources and so harmful to the fishermen's health. When fishermen are unhealthy, it affects their fishing activities and their associated economic benefits.

Fishing Methods

Several methods are adopted in the fishing activities in the study area and these include the use of fishing nets, hooks, ponds/lakes blockage and use of fish cage, among others (Table 4.3). From Table 4.3 it is very clear that the dominant uses of fishing methods in the study area are nets and hooks, either alone or in combination of the two, while the use of motorized boats and use of trawlers appear to be the least, in importance, as methods of fishing in the study area. Motorized boats and trawlers are basically used more in relatively big scale fishing as against the use of nets and hooks by artisanal fishermen. Some of the fishing method used are presented in Plate 4.1.

Table 4.3: Uses of Fishing Methods

Methods	Frequency	Percentage (%)
---------	-----------	----------------

Nets	112	31.3
Hooks	91	27
Motorized boats	16	4.5
Canoes	15	4.2
Fishing basket	21	5.9
Channel blockage	9	2.5
Pond/Lake	31	8.7
Fish Cage	38	10.6
Use trawler	6	1.7
Others	13	3.6
Total	200	100

Source: Fieldwork, 2020.



Figure 4.1: Typical Fishing Nets (a), ponds (b) and local fishing canoes (c).

Just as Table 4.1, Table 4.3 also deals with the number of uses rather than the number of fishermen investigated. Traditional artisanal fisheries involve small scale fishing households, as opposed to commercial companies, and are practiced with low technology such as, in most cases, a one-man un-motorized

canoe, hooks and nets (Plate 4.1), among others, that require very small amount of capital and energy.

The results of the investigation reveal that 78.4 % of the fishermen confirmed the lack of government’s plans, strategies and efforts to address the issues of crude and improper methods of fishing, with its attendant negative impacts. However, the artisanal fishing communities had put in place committees to draw and implement mitigating measures for fish ponds only, but none for other sources of water like the open rivers. Again, 94.4% of the fishermen alleged the irresponsible use of destructive artisanal fishing techniques as the major causes of depletion and collapse of fish resources. The depletion and collapse of fish resources can lead to negative impact of the sector on life on land. It was found that 97.2 % of the fishermen were of the strong opinion that the health and stock of life below water is on the decline and this is impacting negatively on life on land (Table 4.4).

Table 4.4: Declined Health and Stock Status of Life Water

Status	Frequency	Percentage (%)
Negative	36	97.2
Positive	1	2.8
Total	37	100

Source: Fieldwork, 2020.

The use of destructive fishing methods with their attendant negative impact result from the lack of knowledge of International Agreements, Treaties and Commitments on fishing as well as National and State Artisanal fishing legislative requirements known to the fishermen (Table 4.5).

Table 4.5: Knowledge of International and National Agreements on Fishing

Knowledge	Frequency	Percentage (%)
Have Knowledge	7	6.0
Lack of Knowledge	110	94.0
Total	117	100

Source: Fieldwork, 2020.

According to 94 % of the fishermen, international agreements, treaties and commitments on fishing as well as national and state artisanal fishing legislative

requirements were not known to them (artisanal fishermen). This implies that all beneficial and harmful fishing practices contained in such documents are completely not known to them. However, many of the fishermen believe very strongly that the having knowledge of their fishing practices is part of their rights and such should be made as such. This means that fishing practices should move towards an exclusive based rights regime, where government should not control access to fisheries as a way of achieving sustainable fishing. The investigation has revealed further that the fishermen`s opinion was based on the fact that government always makes fake promises, coupled with favouritism, bribery and corruption and payment of high fishing rates, among others and so government control of fisheries is not needed.

It was further revealed by most of the fishermen that the representatives of the artisanal fisheries sub-sector and fishing communities were not consulted in the decision-making processes and were also not involved in other activities related to coastal area management, planning and development (Table 4.6).

Table 4.6: Consultation of Communities in Fisheries Decision Making Process

Level of Consultation	Frequency	percentage (%)
Consulted	6	5.1
Not Consulted	111	94.9
Total	117	100

Source: Fieldwork, 2020.

Similarly, just as the fishing communities were not consulted and involved in decision making process and activities respectively, the Registered Fishing Associations were not consulted and involved in decision making process (Table 4.7).

Table 4.7: Consultation of Fishermen Associations in Decision Making Process

Level of Consultation	Frequency	Percentage (%)
Consulted	34	29.1
Not Consulted	83	70.9
Total	117	100

Source: Fieldwork, 2020.

This lack of consultation by the relevant fishery agencies is contrary to the provisions of the existing Article 10.1.2 of FAO Technical Guidelines for Responsible Fisheries, No. 3. Rome, (FAO. 1996). Apart from the lack of consultation and engagement of fishermen on fishing practice, the fishermen claimed that government officials from Fisheries Department rarely visited them despite the existence of registered community fishing associations (Table 4.8).

Table 4.8: Fisheries Department Monitoring of Fishing Activities

Visit	Frequency	Percentage (%)
Not visited	49	41.9
Rarely	25	21.3
Cannot Remember	43	36.8
Total	117	100

Source: Fieldwork, 2020.

Fishing activities were usually organized by the fishing community heads. Once a fishing lake or pond was rented to a particular fisher, the community head had to announce to the entire community that a lake belonged to particular artisanal fisher to prevent others from going into it. The buyer of a lake could register other fishers to join him for the period. Such registered fisher was given an identification tag which he must wear when going to the lake for fishing. This practice prevents potential conflicts and it is a necessary condition for sustainable fishing.

There seems to be a disagreement of opinion on free and easy access to coastal renewable resources between government agencies, like the Department of Fisheries, and the fishermen. While majority of the public officials believed there was free and easy access to coastal renewable resources, the fishermen believed there was no free and easy access to them (Table 4.9).

Conclusions

Sustainable and responsible Artisanal Fishery and fishing was highly endangered with instances of over and illegal fishing, or improper fishing methods in the region and near absence of Government’s plans, strategies and

efforts to address overfishing, improper methods and means used during fishing and the impacts thereof on fish stocks. The health and stock of life below water is on the decline, impacting negatively on life on land. Artisanal fisheries and Fishermen's organisations practised an exclusive rights-based regime and had no voices in the decision-making process. Also, Representatives of the fisheries sector and fishing communities are not consulted in the decision-making processes and involved in other activities related to coastal area management planning and development. Therefore, the achievement of the SDG 2-zero hunger, SDG 8- Fishing (decent work & well-being) appeared to be a mirage. Over times, fishing may cease to be a major source of food for humanity and a provider of employment and economic benefits to those engaged in this activity not minding the fact that aquatic resources are not infinite and need to be properly managed

Oil spills pollution remains the greatest threat to sustainable/responsible artisanal fishery in the Niger Delta. Pollution and degradation of coastal and marine areas (SDG 3-pollution/erosion) impact negatively on depleting fishery resources (SDG 14-Life below water) and took the forms of: Indiscriminate dumping of refuse on natural water bodies; Death of fishes via fish poisoning/use of chemicals for fishing, and Contamination of water. Oil and grease levels as was the case of Oil and Grease values for Idogbo above permissible concentrations of 10mg/L, can be attributed to crude oil exploration, bunkering, loading and offloading of diesels from boats, and crude oil spills. High oil and grease contents in water can lead to breathing difficulties in fishes and clog fish gills. BOD5 for all stations were above FMEnv permissible limits of 50.0mg/L or in excess of the standard range of 3-20mg/l recommended by Boyd (2003). This shows the presence of high organic loads due to human and animal's activity like faeces and washing of butchered animals in the area.

Alkalinity values were low. This is significant showing that the waters are poorly buffered. A change or introduction of very low acidic or basic constituents can lead to a sharp change in pH values and detrimental effect to aquatic life. Total coliforms were within permissible limits but were relatively high for Idogbo Community. Faecal matter from human and animal activities and especially if the river was close to an abattoir can result to very high values of total coliforms, no effects of industrial activities in the area as shown by the

low level of Toxic metals such as lead, cadmium, copper, zinc within permissible limits.

Total Dissolved solids and Salinity for all locations are within limits except for Gele-gele. This may be due to most likely the nature of the river water characterised by the presence of high dissolved salts. Turbidity values were only slightly above 5.0mg/L. This may not be too significant an effect as the water may be constantly agitated sometimes by activities and this may lead to less transparency at some areas some times.

References

- Abowei, J F N and Hart, A. (2008): Artisanal fisheries characteristics of the fresh water reaches of lower Nun River, Niger Delta, *J. Appl. Sci. Environ. Manage.* March, 2008 Full-text Available Online at Vol. 12(1) 5 - 11 Nigeria. Vol 2, No.3, 2012 38 JASEM ISSN 1119-8362 All rights reserved www.bioline.org.br/ja
- Adati Ayuba Kadafa (2012): Oil Exploration and Spillage in the Niger Delta of Nigeria. *Civil and Environmental Research* www.iiste.org ISSN 2222-1719 (Paper) ISSN 2222-2863 African Convention on the Conservation of Nature and Natural Resources 1968 (Online)
- AGBEJA, Y. E, (2010). Issues and Constraints in the Coastal Fisheries of the Niger-Delta Area of Nigeria, ASCON, BADAGRY, Fisheries Society of Nigeria.
- Aghughu A. A. (1986) The Consumption Function for Bendel State University Ekpoma Junior Workers (USS1-5): An Econometric Analysis. Published by Department of Economics, Bendel State University Ekpoma, Nigeria.
- Aghughu A. A. (1997). The Deposit Insurance and the Banking Sector in Nigeria: A Critical Appraisal. Published by Department of Economics and Statistics, University of Benin, Benin City Nigeria
- Aghughu A. A. et al (2015). Environmental Audit on the Drying up of the Lake Chad: A Focus on Water Resources Quantity Management by the Nigerian Government: 2008-2013
- Aghughu A. A. et al (2017). Environmental Audit Report of the Auditor-General for the Federation on "Integrating Environmental Risks in an Audit at Local Government Level:" Federal Capital City (FCC) of Federal Capital Territory (FCT) Abuja, Nigeria.
- Abam T. K. S. (1999): Dynamics and quality of water resources in the Niger Delta. Impacts of Urban Growth on Surface Water and Groundwater Quality (Proceedings of IUGG 99S yposium HS5, Birmingham, July 1999). IAHS Publ. no. 259, 1999. 429 Institute of Geosciences and Space Technology, Rivers State University of Science and Technology, PMB 5080, Port Harcourt, Nigeria
- Agbugui M. Onwude, Abhulimen E. Fran, Inobeme Abel and Olori Eric (2019): Biodiversity of Fish Fauna in River Niger at Agenebode, Edo State, Nigeria. *Egyptian Journal of Aquatic Biology & Fisheries Zoology Department, Faculty of Science, Ain Shams University, Cairo, Egypt.* ISSN 1110 – 6131 Vol. 23(4): 159- 166 (2019) www.ejabf.journals.ekb.eg
- Ajieh, P. C. (2010). Adoption of Fishery Technologies by Fish Farmers in Akoko-edo Local Government Area, Edo State, Nigeria, *Research Journal of Fisheries and Hydrobiology*, 5(2): 137-143, 2010

- Anita, B. and Pooja, D. (2013). Water quality guidelines for the management of pond fish culture, IJES, Volume 3, No 6, ISSN 0976 – 4402
- Apata, T.G., Akinlua, J.Y and Igbalajobi, O.A. (2009). Determinant of poverty and household livelihood diversification strategies in crude oil producing areas of Ondo State, Nigeria. *Journal of Global Approaches to Extension Practice*. Vol.5, No1. Pp. 122-134.
- ASTM, (1978), “Estimating the Hazard of Chemical Substances to Aquatic Life”, STP 657.
- ASTM, (1979), “Standard Practice for Evaluating Effluents for Flavour Impairment to Fish Flesh”, Annual Book of ASTM Standards D 3696-79.
- ASTM, (1986), “Standard Practices for Conducting Static Acute Toxicity Test on Waste Waters with Daphnia”, Annual Book of ASTM Standards, 11.04, Pg. 64-76.
- Chinedu E.& Chukwuemeka C.K (2018), "Oil Spillage and Heavy Metals Toxicity Risk in the Compensation for Oil Pollution Damage, 1971
Convention on the Prevention of Marine pollution Damage, 1972
Department for Food and International Development of the United Kingdom (DFID) / Food and Agricultural Organisation (FAO) (2004). Sustainable Fisheries Livelihood Programmes (SELP): A participatory rural appraisal of Tatabu fishing community, Niger State, Nigeria. NIFFR/GEP/INT/735/UK, Pp. 9, 17-18.
Department of Petroleum Resources, Lagos (1991 Third Edition (2018) Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN)
Elijah Ohimain (2004): Environmental Impacts of Dredging in the Niger Delta 9 Options for sediment relocation that will mitigate acidification and enhance natural mangrove restoration. published in the Proceedings of the WODCON XVII Congress, held in Hamburg, Germany, September 27 through October 1 2004.
Etim U. U. Ituen and Folarin Alonge A. (2009): Niger Delta Region of Nigeria, Climate Change and the way Forward, An ASABE Conference Presentation Paper Number: BIO-098276, Written for presentation at the 2009 Bioenergy Engineering Conference Sponsored by ASABEH yatt Regency Seattle, Washington October 11-14, 2009
Endangered Species Decree Cap 108 LFN 1990.
Environmental Impact Assessment (EIA) decree No 86 of 1992 protection agencies.
Ezeanya, N.C. and Chukwuma G.O., et. al (2015). Standard Water Quality Requirements and Management Strategies for Fish Farming (a case study of Otamiri River), IJRET:ISSN: 2319-1163 | pISSN: 2321-7308 (Volume: 04 Issue: 03 | Mar-2015, Available @ <http://www.ijret.org>) Niger Delta, Nigeria" *Journal of Health & Pollution*, Online publication
Federal Environmental Protection Agency National Guidelines for Environmental Audit in Nigeria, 1999.
Federal Environmental Protection Agency National Guidelines for Environmental Audit in Nigeria, 1999.
Federal Environmental protection Agency Act Cap 131 LFN 1990.