Evaluating the Legal Framework on Sand Mining in Nigeria: Challenges and Prospects

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A. Abstract

The need for discussions around the sustainability of natural resources in Nigeria cannot be overemphasized. Nigeria is blessed with a number of minerals. Despite these, the country has operated a monolithic economy and has neglected activities in other areas of mining especially sand. Sand is a major resource mined in Nigeria due to its high demand in various industries and most times illegally. This necessitates the evaluation of the legal framework on sand mining in Nigeria. This paper adopts a doctrinal approach and finds that sand mining in Nigeria faces several challenges ranging from the non-implementation of the relevant legal framework to unregulated activities in the sector. The paper further finds that the Nigerian Minerals and Mining Act of 2007 did not specifically address sand mining but mentions sand in the interpretation section as a mineral in the country. The regulation of sand mining was not specifically given prominence but is subsumed under small-scale mining. The paper notes that sand mining has attendant socio-economic and environmental impacts. The paper further notes that one of the challenges in this sector is inadequate infrastructure and poor monitoring by the relevant government agencies. The research therefore recommends the enactment and enforcement of regulations on sand mining specifically. It also recommends public private partnership in the sector to help in infrastructural development. The paper concludes that effective community participation and engagement in the sector will help address the issues of conflict and environmental degradation.

Keywords: Sand, Mining, Community, Development, Conflict, Challenges

B. Introduction

The boom in the construction industry in the 21st Century has led to unregulated mining of sand all around the world. This activity has eroded rivers and coastlines, disrupting ecosystems and damaging livelihoods. From Abuja and other cities in Nigeria to China, America and several parts of the world, sand mining is a significant component of development. The cities we have in Nigeria and other cities are built on sand. There is sand in the cement and concrete that constitutes the bulk of the buildings. The glasses in the building windows are

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made with sand. The tarmacs laid on the roads are also made with sand. Sand is the planet's most mined mineral, with some 50 billion tons extracted from lakes, riverbeds, coastlines and deltas each year, according to the United Nations Environment Programme.[1] According to the UN, 'the global daily demand for sand is around 18kg per person on average, per person, that's about 6,570 kilograms (14,500 pound) per year – more than an elephant's weight in sand.[2]

Demand for sand has continued to grow as the population of the world continues to grow, with expansion in cities. In almost all parts of the world, sand mining has not been fully regulated and transactions scrutinized by the relevant government agencies. Regulations for protecting the environment or the safety of the workers are few and sparse. It is doubtful whether the agencies monitor or document the activities in this trade for the impact it is generating.

The resultant effect of this unregulated business is that sand is being extracted far more quickly than it can be replaced naturally.[3] This causes environmental damage and in some instances, threatening the lives and livelihood of citizens. It is also important to observe that most of the sand mined is used in the countries where they are mined or extracted. In Africa, sand extraction has enabled the vast majority of the people to build strong homes but this has left the ground pocked with open pits, which can fill up in rainy seasons, providing breeding ponds for disease carrying mosquitoes.[4] People have also suffered from these mining activities whether they are legal or illegal.

It is in view of the above that this paper seeks to evaluate the laws and processes regulating sand mining in Nigeria examining the challenges and the prospects in sand mining. Therefore, for a lucid discussion of the issue under review, this paper is divided into six parts including the introduction. Part II discusses the relevant concepts that will occur in the course of the discussions. Part III examines the regulatory framework for sand mining in Nigeria and the attendant consequences for the regard of the existing legal regime. Part IV discusses the impacts or challenges associated with sand mining. Part V examines the prospects of the industry while the sixth part concludes the paper.

C. Conceptual Clarifications

I. What is Sand?

Sand is defined as a mixture of small and fine grains of various materials and rocks. It is a granular material that can be defined as per a size ranging between 0.06mm to 2mm.

1 Marco Hernandez, Simon Scarr and Katy Douglee, "Shifting Sands: The Messy Business of Sand Mining Explained," (Feb 18, 2021), <https://www.reuters.com/graphics/Global-Environment/Sand/ygdpzekyavw/> accessed August 11, 2024.

2 United Nations Environment Programme, UNEP.

3 Hernandez (n1).

4 *Ibid*.

It can be formed because of erosional or weathering activities, sediments, etc.[5] The major component of sand is quartz and other components found in sand depend on the location and geographical features of where it is found.[6]

Toky Siddiquee[7] posits that 'sand is a mixture of small grains of rock and granular materials which is mainly defined by size, being finer than gravel and coarser than silt. And ranging in size from 0.06mm to 2mm. Particles which are larger than 0.0078125mm but smaller than 0.0625mm are termed silt.' He further observed that sand is made by erosion or broken pebbles and weathering rocks, which is carried by seas or rivers.[8]

Sand is composed of unconsolidated granular materials consisting of either rock fragments or mineral particles or oceanic materials. It is mainly made of silicate minerals and silicate rock granular particles.[9] Sand is made up of different colours.[10] There are also different types of sand although it is observed that sand is a highly variable substance and therefore an attempt can be made to classify it into separate categories[11] and depending on the particle grain size, sand can be very coarse, hoarse, medium or fine grained.[12]

II. Sand Mining

Sand mining or extraction is defined as the removal of primary (virgin) natural sand and sand resources (mineral sands and aggregates) from the natural environment (terrestrial, riverine, coastal, or marine) for extracting valuable minerals, metals, crushed stone, sand and gravel for subsequent processing.[13] Sand mining is the extraction of sand usually from an open pit. It can also be mined from sand dunes, beaches, and even dredged from river and ocean beds. The main reason is to provide sand for concrete, which is due to

5 "Sand – Meaning, Types, Construction Sand, and FAQs," <https://www.vedantu.com/geography/sand> accessed August 11, 2024.

6 *Ibid*.

7 Toky Siddiquee, "What is Sand? Composition and Types of Sand – Civil Engineering," <https://www.civiltoday.com/civil-engineering-materials/sand/233-sand-composition-types/> accessed August 11, 2024.

8 *Ibid*.

9 *Ibid*.

10 There are white sand, black sand, pink sand, red-orange colour, white-grey colour and light brown color.

11 These include coral sand, glass sand, immature sand, gypsum sand, doid sand, silica sand, pit sand, river sand, sea sand, green sand, desert sand, lithic sand, mixed carbonate-silicate sand, brogenicc sand, olivine sand, volcanic sand, heavy mineral sand, sand with hematilic pigment, continental sand, quartz sand.

12 Farooq, "What is Sand? Types, Advantages and Properties," (Feb 12, 2024), <https://www.alphasand.in/blog/types-of-sand/> accessed August 11, 2024.

13 UNEP, "Sand and Sustainability: Finding New Solutions for Environmental Governance of Global Sand Resources." GRID – Geneva, United Nations Environment Programme (UNEP); Sand Mining, <https://www.preventionweb.net/understanding-disaster-risk/terminology/hips/en0022> accessed August 11, 2024.

urbanization boom all over the world.[14] Sand can also be used as a mixer with salt to prevent ice on roads or to reshape coastlines that have significantly eroded.[15]

Picture of a mining site in Zamfara state of Nigeria. Courtesy: Daily Nigerian News Desk

III Dredging

Dredging is the removal of sediments and debris from the bottom of lakes, rivers, harbours, and other water bodies. It is a routine necessity in waterways around the world because sedimentation – the natural process of sand and silt washing downstream – gradually fills channels and harbours.[16] Dredging often focuses on maintaining or increasing the depth of navigation channels, anchorages, or berthing areas to ensure the safe passage of boats and ships.[17] Dredging is basically performed to reduce the exposure of fish, wildlife, and people to contaminants and to prevent the spread of contaminants to other areas of the

14 Envirotech, "What is Sand Mining?" (March 11, 2017) <https://www.envirotech-outline.com/news/water-wastewater/9/breaking-news/what-is-sand-mining/42070/> accessed August 11, 2024.

15 *Ibid*.

16 National Ocean Service, "What is Dredging?" <https://www.oceanservice.nwag.gov/facts/dredging.html> accessed August 11, 2024.

17 *Ibid*.

water body. Environmental dredging is often necessary because sediments in and around cities and industrial areas are frequently contaminated with a variety of pollutants.[18]

The sand that is used for several purposes is dredged by a hydraulic dredge and picks up small amounts of silt, shell and mud along with sand. The mix will dewater over a few days and depending on the content of the mixture, can look as good as any sandy area nearby.[19] Dredging is a critical process with wide-reaching benefits serving both environmental and industrial needs and these include – maintaining existing waterways, creating new waterways, increasing waterway depth, and cleaning ponds and lagoons.[20]

Sand dredging is an important and fundamental process for beach reclamation or nourishment, where the issue of beach erosion needs to be mitigated. It's essentially a form of excavation that is carried out underwater, specifically in shallow seas or freshwater areas. Its primary purpose is to preserve the existing shoreline by adding sand back to a beach that is suffering from erosion.[21]

Sand dredging is typically employed to combat the adverse effects of coastal erosion, maintain navigable waterways or create new land from the sea or riverbeds.[22] It is important to note that dredging does not stop erosion and there is the potential of habitat destruction due to dredging. Flora and fauna may be destroyed by removing large quantities of sand from the sea bed. Again, adding new sand to the beach may cover up ecosystems that are not clear to the human eye.[23]

18 *Ibid*.

19 Southern Dredging and Marine, "Beach Restoration Renewal: Southern Dredging," <https://www.southerndredgingandmarine.com/beach-restoration-renewal/> accessed August 11, 2024.

20 International Geoform, "Dredging 101: What it is, How it Works, Benefits and More," <https://geoinforminternational.com/sediment-removal-101/> accessed August 11, 2024.

21 US Aqua Services, "Understanding Beach Reclamation and Sand Dredging," (July 26, 2023) <https://www.usdredge.com/learn/understanding-beach-reclamation-and-sand-dredging?hs_amp=true/> accessed August 11, 2024.

22 *Ibid*.

23 *Ibid*.

Sand dredging in Nigeria. Courtesy: richbongroupng.wordpress.com

D. Legal Framework on Sand Mining in Nigeria

Having noted that sand is a valuable resource for crucial purposes like construction and other industrial uses such as the production of glass, it is also an essential material used for other important infrastructure for economic development, serving livelihoods within communities as well as maintaining biodiversity.[24] Sand is the key raw material in concrete, asphalt and glass, used to build infrastructure.[25] It is also used for reclamation of land and as a protection against flood in coastal areas, and part of the efforts to protect eroding coasts and address climate change impacts such as sea level rise and increasingly severe storms.[26] In view of the enormous roles that the mining industry plays in Nigeria and world over towards the realization of a carbon-free future and Nigeria's position as the largest economy in the African region, it is difficult and impossible to ignore the mining sector in Nigeria. Living by the available data from the Federal Ministry of Mines and Steel Development, Nigeria is endowed with 44 types of minerals available in commercial quantities across 500 locations in the 36 states of the Federation and the Federal Capital

24 International Association of Dredging Companies (IADC), "Sand as a Resource: Best Practices to Conduct Responsible Dredging Projects," Fordeyn J., Janssens T., Kranendonk Y. and Vijverberg T (The Hague: IADC, 2023), 1–24 at 3.

25 *Ibid*.

26 *Ibid*.

Territory (FCT).[27] Although the mining sector has experienced some challenges, it has also shown a steady growth pattern.[28] The growth trend however requires more effort to set the sector on the path to earning Nigeria a place of pride on the global mining map and one of these measures includes having a strong regulatory framework and policies to check activities and ensure that due processes, compliance and monitoring mechanisms are not jettisoned.

Nigeria has the Nigerian Minerals and Mining Act, 2007. This Act is the major framework in the mining sector. On November 16 2023, the Hon. Minister of Solid Minerals Development launched the 'Guidelines for the Production of Community Development Agreement in the Solid Minerals Sector' (the Guidelines).[29] The Guideline was issued in pursuance of Section 116 of the Nigerian Minerals and Mining Act, 2007 which is the principal legislation. The Act provides that "…The Minister shall upon the receipt of a valid application from a qualified applicant, grant and issue to that person a mining lease for the purposes required within forty-five days of such application.[30]

The reason for the application for a license is predicated on the fact that the Act provides that:

> *The entire property in and control of all mineral resources in, under or upon any land in Nigeria, its contiguous continental shelf and all rivers, streams and water courses throughout Nigeria, any area covered by its territorial waters or constituency and the Exclusive Economic Zone is and shall be vested in the Government of the Federation and on behalf of the people of Nigeria.*[31]

27 Benjamin Amans, Emediong Essien and Deborah Samson, "Nigeria Mining Outlook: Wrap-up of Recent Developments and Updates," (August 2023) Newsteller, Jackson Etti and Belu, Lagos, <https://www.jee.africa/> accessed August 7, 2024.

28 *Ibid*. This growth can be linked to the technological advancement, intensified efforts aimed at combating illegal mining activities, increased global recognition, revenue generation and accountability among other factors. These positive developments highlight the sector's potential to attract foreign investment which will in turn help Nigeria to further diversify its economy towards a non-oil source for increased economic sustainability.

29 Bashur Toyin, Habiba Ellawulh, Ayorunde Esther and Femi-Oydekola Kolapo, "Highlights of the Guidelines for the Production of Community Development Agreements in the Solid Mineral Sector issued by the Ministry of Solid Minerals Development," (February 1, 2024, <https://www.mondaq.com/nigeria/mining/1421454/mining-regulatory-update-highlights-of-the-guidelines-for-the-production-ofc-community-development-agreements-in-the-solid-minerals-sector-issued-by-the-ministry-of-solid-minerals-development/> accessed July 27, 2024. See also <https://www.banwo-ighodalo.com/grey-matter/mining-reegulatory-update> accessed July 27, 2024.

30 Nigerian Minerals and Mining Act 2007, Section 65(1).

31 *Ibid*, Section 1(1).

It further provides that:

> *All lands in which minerals have been found in commercial quantities shall, from the commencement of this Act be acquired by the Government of the Federation in accordance with the provisions of the Land Use Act.*[32]

The import of these provisions is that all minerals in Nigeria is owned by the federal government who holds such in trust for the benefit of the citizens and if a mineral is discovered on any land, such land automatically becomes the property of government in line with the Land Use Act. Nigerians therefore do not have absolute right of the ownership of their lands unless a mineral is not found on the land. If it is found, they only enjoy surface rights as the land is acquired by the government upon the payment of compensation to be determined through arbitration.

The above provisions are supported by the Constitution of the Federal Republic of Nigeria as amended. The Constitution provides that:

> *...Notwithstanding the foregoing provisions of this Section, the entire property in and control of all minerals, mineral oils and natural gas in, under or upon any land in Nigeria or in, under or upon the territorial waters and the Exclusive Economic Zone of Nigeria shall vest in the government of the federation and shall be managed in such manners as may be presented by the National Assembly.*[33]

The question then arises as to why sand mining in Nigeria has not been fully regulated like oil and gas. Is it that the government does not see sand as a core mineral deserving of its attention considering the environmental consequences that occurs due to sand mining? A quick review of the Nigerian Mining and Minerals Act reveals that 'Sand' Mining was not specifically mentioned in any of its provisions. In chapter 2 of the Act particularly sections 90 and 91, the Act dealt with "small scale mining." In the interpretation section,[34] 'small scale mining' is defined as 'artisanal, alluvial, and other forms of mining operations involving the use of low-level technology or application of methods not requiring substantial expenditure for the conduct of mining operations within a small scale. In the same vein, minerals or mineral resources means any substance whether in solid, liquid or gaseous form occurring in or on the earth, formed by or subjected to geological processes including occurrences or deposits of rocks, coal, coal bed gases, bituminous shales, tar, sand, any substance that may be extracted from coal, shale or tar sand, mineral water and mineral component in tailings and waste piles, but with the exclusion of petroleum and waters without mineral content.[35] This is the only place sand was mentioned in the entire Act.

32 *Ibid*, Section 1(2).

33 Constitution of the Federal Republic of Nigeria 1999 (as amended), Section 44(3).

34 Nigerian Mining and Minerals Act 2007, Section 164.

35 *Ibid.*

> *Quarry operations under the Act includes any forms of activity for the extraction of mineral resources for construction, other than an activity conducted or to be conducted underground, and any activity preparatory or incidental to that activity those to.*[36]

Having noted that sand is mentioned in the interpretation section as constituting mineral or mineral resource and can be extracted via quarrying, it then presupposes that those involved in its mining or extraction are involved in what the Act terms "small scale mining" and are to be issued the "small scale mining lease" which is defined as "small-scale mining lease granted for exploitation of mineral resources and in this Act, in an area subject of a small scale mining lease described as small-scale mining area".

The mining and Mineral Act provides that a person to be issued with a small-scale mining lease should be:

(a) A citizen of Nigeria with legal capacity and who has not been convicted of a criminal offence, or
(b) A mining cooperative, or
(c) A body corporate duly incorporated under the Companies and Allied Matters Act, or
(d) The holder of an Exploration License granted in respect of the areas subject to the application; provided that the applicant has fulfilled the conditions attached to the Exploration License.[37]

The same conditions were set out for the granting of a quarry license except that a person holding an exploration license cannot apply but 'any person extracting construction materials for the construction of roads, railways lines, dams and other engineering works or structures of public interest.'[38] The Act designates the areas to be covered by a small-scale Mining lease. It stipulates that it shall not be less than 5 acres and shall not exceed 35 square kilometers. It further provides that "all lease holders shall carry out effective rehabilitation of the mined-out areas to the satisfaction of the Mines Environmental Compliance Department and also pay prescribed rehabilitation fee, proportionate to their profits as a way to defray further cost of rehabilitation and reclamation.[39]

The small-scale Artisanal Mining Department shall ensure that mining activities are restricted to the established zones of mineralization.[40] The challenge here is that the small-scale mining lease does not have a duration like the other mining lease which is expected to last for 25 years,[41] and shall be renewable every twenty-four years. Is the small-scale mining lease renewable or lasts in perpetuity and if it is renewable, what is the time frame?

36 *Ibid.*
37 *Ibid,* Section 49.
38 *Ibid*, Section 51 (a)-(d) particularly (d).
39 *Ibid*, Section 90 (1) (2).
40 *Ibid*, Section 90(3).
41 *Ibid*, Section 66.

How effective has the Small-Scale Mining Department been in ensuring that the small-scale miners keep to the designated area assigned for mining and that they keep to the area specified in the license. The absence of time frame for renewal of this lease in the law is a huge gap and makes monitoring and evaluation difficult. If there is an opportunity for the renewal of the lease, it creates an environment for effective monitoring as renewal will be dependent on the applicant's ability to meet and fulfill the laid down rules attached to the license/lease.

Furthermore, it is clear that the Mining Department has not performed optimally as there are burrow pits constituting dangers to the environment, lives and livelihoods. This is so when compared to their duties listed under the Act. The Mines Environmental Compliance Department shall in addition to any other function prescribed by the Act and subject to the directive of the Minister:

- …Monitor and enforce compliance by holders of mineral title with all environmental requirements and obligations established pursuant to this Act, its regulations and by any other law in force;
- Periodically audit the environmental requirements and obligations established pursuant to this Act, its regulations and by any other law in force and make recommendations thereon to the Minister, and
- dLiaise with relevant agencies of government with respect to the social and environmental issues involved in mining operations, mine closure and reclamation of land.[42]

Of particular relevance is the issue of environmental monitoring with the attendant obligations and the cooperation with other agencies of government to ensure the social and environmental issues are complied with and ensure the closure and reclamation of land. This is a huge challenge as lands are not recovered or reclaimed and these mining sites remain as death traps to citizens. In some cases, the lands around such areas become erosion gullies affecting buildings and other infrastructure around them. This is in contrast with Section 111 of the Act which stipulates that 'the holder of mineral title shall, in exercise of his rights under the mineral title, have regard to the effect of the mining operations on the environment and take such steps as may be necessary to prevent pollution of the environment resulting from the mining operation.' Furthermore, the Act provides that where land which 'is the subject of a mining lease has been exploited, the mined-out areas shall be restored by the applicant under the condition of its grant otherwise the relevant provision of the Act will apply.'[43]

It is interesting to observe that the penalty for not complying with the provision of the Act is revocation of license and on conviction at the first instance, to a fine of not less than N20, 000,000 and imprisonment of not less than five years, and if the offence continues, whether or not it is a first offence, the person convicted shall, in addition be liable to

42 *Ibid*, Section 18 (b)-(d).

43 *Ibid,* Section 115.

a fine of N20, 000 in respect of each day during which the offence continues.[44] The penalty, prima facie appears punitive but the extent of its implementation and application in relevant situations is another issue in its entirety. This is because, if the law has been duly implemented and enforced, there would be compliance by the lease or license holders and a great improvement would be seen in these mining/extraction fields. It can be argued that the law is honoured more in breach.

Another critical provision of the Nigerian Minerals and Mining Act is the Community Development Agreement.[45] This provision will be reproduced hereunder:

i. Subject to the provision of this Section, the holder of a Mining Lease, Small-Scale Mining Lease or Quarry Lease shall prior to the commencement of any development activity within the lease areas, conclude with the host community where the operations are to be conducted on agreement referred to as a Community Development Agreement or other such agreement that will ensure the transfer of social and economic benefits to the community.
ii. The Community Development Agreement shall contain undertakings with respect to the social and economic contributions that the project will make to the sustainability of such community.
iii. The Community Development Agreement shall address all or some of the following issues when relevant to the host community.
    a) Educational scholarship, apprenticeship, technical training and employment opportunities for indigenes of the communities.
    b) Financial or other forms of contributory support for infrastructural development and maintenance such as education, health or other community services, roads, water and power.
    c) Assistance with the creation, development and support to small scale and micro enterprises;
    d) Agricultural product marketing; and
    e) Methods and procedures of environment and socio-economic management and local governance enhancement.
iv. In the event of the failure of the host community and the lessee, after several attempts to conclude the Community Development Agreement by the time the title holder is ready to commence development work on the lease area, the matter shall be referred to the Minister for resolution.
v. The Community Development Agreement shall be subject to review every 5 years and shall, until renewed by the parties, have binding effect on the parties.

The implication of the above stated provision is that the holder of the lease must finalise with the host community an agreement to be known as "Community Development Agree-

44 *Ibid*, Section 133.
45 *Ibid*, Section 116.

ment (CDA)" and the agreement will ensure the transfer of social and economic benefits to the host community before the commencement of mining/extractive activities within the area covered by the lease. Such social and economic benefits that will lead to sustainable development includes educational scholarship, apprenticeship, technical training, employment opportunities, financial or other contributory support for the development of critical infrastructures like roads, water and power; assistance with the creation and development of small scale and micro enterprises; agricultural marketing, environment and socio-economic management and local governance enhancement. The CDA will be developed and sent to the Minister of Solid Minerals Development and such CDA will be binding on the parties and subject to review every 5 years.

This provision is quite laudable. On November 16, 2023, the Honorable Minister of Solid Minerals Development Dr. Dele Alake launched the 'Guideline for the Production of the CDA in the Solid Mineral Sector.'[46] This is a good innovation but is also an indication that prior to 2023, much had not been done to ensure that the CDA becomes implementable years after the enactment of the Minerals and Mines Act of Nigeria. The revised guideline is part of the Ministry's efforts to stop disputes between communities and mining companies. The Minister also revealed that 252 mining companies have signed Community Development Agreements to provide basic infrastructure to host communities.[47] He further noted that the Agreements is a better means to help the mining companies define their relationships and obligations with their host communities as the agreement provides a means of strengthening and advancing relationship.[48]

The vision of the CDA includes the improvement of the relationship between host communities and the companies, the government, the civil societies and other stakeholders; to improve sustainable and mutually rewarding benefits from mining projects to the host communities.[49] The previous guideline of 2014 was not effective as the mining companies did not develop CDAs nor were they willing to implement the Agreements. This led to numerous complaints and Petitions from the communities. It is hoped that the revised guideline of 2023 will address the gaps identified in the existing CDA of 2014. The Nigeria Extractive Industries Transparency Initiative (NEITI) disclosed that 82 mining firms default

46 Damilola Aina, "Mines Ministry unveils revised CDA Guidelines (Nov 17, 2023) <https://www.punchng.com/mines-ministry-unveil-revised-cda-guidelines/?amp> accessed August 14, 2024.

47 Sami Tunji, "Dele Alake says 252 Mining Companies agree to provide basic infrastructure to host communities in Nigeria," (November 16, 2023) <https://www.naurametrics.com/2023/11/16/dele-alake-say-252-mining-companies-agree-to-provide-basic-infrastructure-to-host-communities-in-nigeria/pamp=/> accessed August 14, 2024.

48 The CDA can help prevent a repeat of social crises experienced in the Niger Delta by the oil sector, which may undermine the efforts of the federal government amend at diversifying Nigeria's monolithic economy.

49 Aina (n46).

in their payment to host communities.[50] They further noted that in their 2021 report for the solid minerals industry that out of 121 companies, only 39 made the mandatory social payments in line with the CDA.[51] NEITI further reported that only 50 out of 121 companies representing 41.32 percent fully complied with environmental standards, indicating low overall compliance with environmental laws and regulations by most companies. The overall objective of the CDA is 'to specify appropriate consultative and monitoring frameworks between the title holders and the host communities and the means by which the community may participate in the planning, implementation, management and monitoring of activities carried out under the agreement.'[52] This is good as it encourages local participation in activities in the communities. This type of participation enables the locals to make valuable contributions on investments within their territories and enhances monitoring and compliance when effectively engaged.

E. Impacts of Sand Mining in Nigeria

Sand mining has tripled in the past two decades, with demand reaching 50 billion tons a year in 2019 according to UNIEP. The volume of sand and gravel used each year is estimated to build a wall around the equator measuring 27 meters wide.[53] But extraction, sourcing, use and management of sand is unregulated in many parts of the world including Nigeria, which means, the world is consuming sand faster than it can be replaced naturally by geological processes[54].

The United Nations Environment Programme (UNEP) has noted that sand mining from riverine and marine eco-systems can lead to erosion, salination of aquifers, loss of protection against storm surges and impacts on biodiversity, which pose a threat to livelihoods through among other things, water supply, food production, fisheries, or to tourism industry.

In 2018, the World Wildlife Fund (WWF) warned that sand mining of river Deltas, such as the Yangtze and Mekong, is increasing the risk of climate related disasters because there is not enough sediments to protect against flooding.[55] They further noted that sand mining puts unprecedented pressure on rivers, flood plains and delta. The impacts also include changes in the shape of river beds and flood plains to alterations to instream habitats,

50 Sami Tunji, "NEITI – 82 mining firms default payments to host communities," (September 17, 2023) <https://www.punch.ng.com/82-mining-firms-default-payments-to-host-communities-neiti/> accessed August 14, 2024.

51 *Ibid.*

52 The Nigerian Minerals and Mining Act 2007, Section 117.

53 Kate Whiting and Medeleine North, "Sand Mining is close to being an Environmental Crises. Here's Why and What can be done about it?" (September 21, 2023) < https://www.weforum.org/agenda/2023/09/global-sand-mining-demand-impacting-environment> accessed August 12, 2024.

54 *Ibid.*

55 WWF, "Uncovering Sand Mining's Impacts on the World's Rivers" (August 24, 2018), <https://www.wwf.panda.org/wwf-news/p333451/uncovering-sand-minings-impacts-on-the-worlds-rivers/> accessed August 15, 2024.

groundwater reserves and water quality. In addition, sand mining can result in a reduction in diversity and abundance of fish in mined areas and changes to riverside vegetation.[56] Unsustainable sand mining will lead to bank erosion and shrinking, sinking deltas – with the loss of agricultural land, houses and infrastructure, including failure of roads, dikes and bridges.[57] In Nigeria, where unregulated sand mining has been the practice, the act has had severe impacts for local communities. A significant impact is the displacement of communities that depend on natural resource for their livelihood.[58] Sand mining often involves dredging and excavation, which can destroy crops, fisheries and other sources of livelihood.[59] Again, sand mining in Nigeria causes environmental pollution, as the act involves the use of heavy machinery that releases emission and noise pollution.[60] Another impact recorded by sanction on sand mining in Nigeria is the damage to infrastructure. This can cause erosion and sedimentation, which can affect bridges, road and other infrastructure and lead to costly repairs and even accidents such as road and bridge collapses.[61] Sand mining contributes to climate change. This is due to the fact that sand mining releases large quantity of carbon dioxide into the atmosphere, which contributes to global warming.[62] Again, the loss of vegetation due to sand mining can reduce the capacity of natural ecosystems to absorb carbon dioxide from the atmosphere.[63]

In Nigeria, there are specific instances recorded in previous studies on the impact of sand mining in Nigeria. The first is the Lekki Beach Erosion which has been blamed on sand mining. The erosion has affected the beach front, causing damage to buildings and infrastructure. It was recorded that in 2017, the Lagos State government banned sand mining in Lekki but the ban has been difficult to enforce and illegal sand mining continues unabated.[64] Another impact is the environmental degradation in Cross River State another costal Community. Here, sand mining has caused extensive environmental degradation. The activity has destroyed farm lands, aquatic habitats, and forests. The government had set up

56 *Ibid.*

57 Social Development Integrated Center, "Sand Mining and the Environmental Impacts on Coastal Communities in Nigeria," (August 21, 2023) <https://saction.org/sand-mining-and-the-environmental-impacts-on-coastal-communities-in-nigeria/> accessed August 2, 2024.

58 *Ibid.*

59 *Ibid.*

60 *Ibid.*

61 *Ibid.*

62 *Ibid.*

63 Ventures Africa, "Illegal Sand Mining in Lagos has been a long standing Problem: This is how its being combated" <https://www.venturesafrica.com/illegal-sand-mining-in-lagos-has-been-a-long-standing-problem-this-is-how-it-being-combated/> accessed August 15, 2024.

64 Okereke C.E. and Eze F.N., "Environmental Degradation from Indiscriminate Sand Mining in Cross River State, Nigeria. *Journal of Environmental Science and Public Health* (2020), 4(2), 63–73.

a task force to enforce the ban on sand mining, but it has been difficult to curb the illegal activity.[65]

The activity of sand mining has damaged fishing ground, making it difficult for fishermen to make a living. The government has set up a committee to investigate the issue, but no concrete action has been taken.[66] A study carried out at Ekiti State reveals that the economic impact of mining activities in the areas showed that the sum of N81,057,000 will be required to sand fill the mined areas. The environmental impact of the mined areas on the communities includes the attendant valley that has been created and the enhancement of erosion activities in the community. Farming activities no longer take place in the mined areas because the top soil has been removed.[67]It was revealed at Chibiri, Kuje Area Council of the FCT, Abuja, that large volumes of sand are being lost to mining and the continuous movement of heavy trucks used in carrying the sand disturb agricultural land, human habitation, borehole user and traffic hazards. The big wheels of the trucks also destroy gravel road leading to mining sites and makes the roads uneven for other road users.[68] The effect of those trucks on the roads can also be seen in Benin City, Edo State and Agbor in Delta State. These trucks also use diesel and further pollute the environment due to the smokes emitted by these trucks. These smokes cause difficulties and blur the vision of motorists and sometimes lead to accidents.

A study done on sand mining in Port Harcourt, Rivers State revealed that Choba, a community within the state, suffers the most visible impact of soil erosion that stood at 27 % while in Abuloma, the impact also accounted for 27 % with noise pollution at 33 %. Road destruction at Choba had 28 %, while land alteration and degradation featured very low in occurrence across the study locations.[69] The study also revealed that commercial activities along the mining sites have exploited coastal resources such as sand, indigenous forest and sea grasses indiscriminately and the consequences are coastal erosion and vegetation loss. This was attributed to heavy vehicular traffic and lack of maintenance by miners

65 Nkarocha, E.E and Opara, C.E, "the Effects of sand Mining on the fishing ground of selected Rivers in Delta State, Nigeria" *Journal of Geography, Environment and Earth Science International* (2018) 15(3) 1–10, <doi:10.9734/JGEESI/2018/42241> accessed August 15, 2024.

66 Atejioye A.A. and Odeyemi C.A., "Analysing Impact of Sand Mining in Ekiti State, Nigeria using GLS for Sustainable Development," *World Journal of Research and Review* (WJRR) (2018) 6(2) 26–31.

67 Oluyori N.R. and Umeh C., "Environmental Impact of Sand Mining and its Attendant Soil Loss in Chibiri, Kuje Areas Council FCT, Abuja," <https://www.researchgate.net/publication/375837625> accessed July 27, 2024.

68 Ohaeri, M.C.A., Ogbonna D.N., Gobo A.E. and Ngah S.A., "Environmental Impacts of Sand Mining in some Coastal Communities in Port Harcourt Metropolis, Nigeria," *Journal of Applied life Sciences International* (2021) 24(10) 31–43. Doi: 10.9734/JALSI/2021/vi1030265> accessed July 27, 2024.

69 *Ibid* at 36.

and this causes environmental concerns.[70] In Minna, the erosion caused the destruction of roads in the mining communities. The original landscape of the communities was destroyed and altered as a result of excavated pits and branches, learning behind unpleasant sights which render the land unsuitable for any productive purpose.[71]

During raining season, the pits and depressions created by abandoned mine sites collect water which become a health risk to the community because these waters become stagnant and serve as breeding ground for mosquitoes and other water borne disease.[72] In Choba, roads are destroyed by heavy trucks and equipment which move in and out of the mining site. The heavy trucks cause soil compaction which increases the erodibility of the soil, reducing soil infiltration which causes overland flow. Heavy vehicular traffic in Choba caused the destruction of access roads. The roads are badly damaged and most times, the vehicles get stuck and damaged during wet seasons, and this results in seeking of alternative routes to mine sites by the miners. These impacts affect the environment and cause environmental pollution which is a huge problem in these communities where mining activities take place.[73] The pollution are usually air, land, water, and noise pollution and the National Environmental Standard Enforcement Regulation Agency Act of 2007 (NESREA Act) ought to be deployed in regulating these pollution.[74]

Indiscriminate waste disposal is another environmental hazard experienced in villages and mine sites around the coastal communities where mining take place. The above analysis is proof of the fact the mining has had a lot of negative impacts on the communities within the mining zone and these impacts are similar and present in the same pattern on the community and the inhabitants.

70 Ako T.A., Onoduku U.S., Oke S.A., Essien B.I., Idris F.N., Umar A.N. and Ahmed A.A., "Environmental effects of Sand and Gravel Mining on Land and Soil in Luku, Minna, Niger State, North Central Nigeria", *Journal for Geoscience and Geomatics* (2014) 2(2) 42–46.

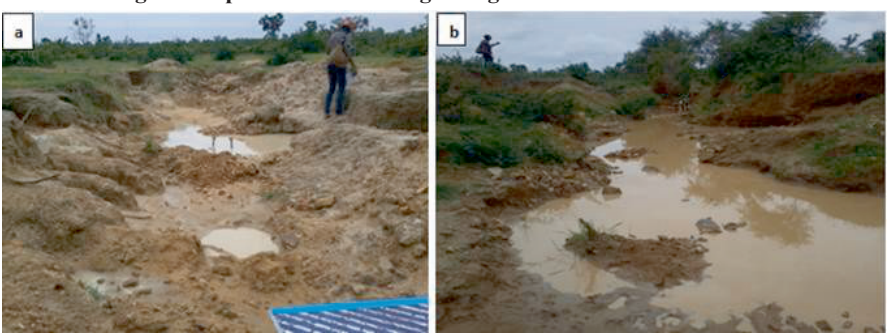
71 Ohaeri (n 68) 36.

72 *Ibid.*

73 NESREA Act 2007, National Environmental Standards and Regulation Enforcement Agency (Establishment) Act, 2007 (No 25 of 2007). This Act repealed the Federal Environmental Protection Agency (FEPA) Act of 1990.

74 Abraham C.M., Essien K., Umoh E.U., Umoh E.C., Ehiremen L.E., Akpan V. and William N.I., "Towards Effective Monitoring of Sand Mining Sites and Post Management Techniques in sand dredged environment of Akwa Ibom State, Nigeria, *Global Journal of Ecology*, (2021) 6(1) 092–099 at 094. Doi: https://dx.doi.org/10.17352/gje.0000150 accessed July 27, 2024.

Pictorial images of impact of Sand mining in Nigeria



Mining on Land and soil in Lukku, Minna, Nigeria[75]

75 Ako T. A, et al. "Environmental Effects of Sand and Gravel Mining on Land and Soil in Luku, Minna, Niger State, North Central Nigeria." *Journal of Geosciences and Geomatics* 2.2 (2014): 42–49.

Sand mining in Nigeria waterways[76]

The next section discusses the challenges to effective monitoring and control of mining in Nigeria.

F. Challenges of Sand Mining in Nigeria

Sand and gravel are extracted globally as we have earlier noted and they account for the largest volume of solid minerals extracted by erosive process.[77] There is a heightened demand for sand and gravels for developmental purposes and this has led to severe impacts on lives and livelihoods. What then are the challenges? This section discusses some of these challenges and how the situation can be improved. Some of these challenges include but not limited to:

76 Bekede Masade-Olowola, 'Sand Dredging in Nigeria's Waterways: Between the Economic Boom and Environmental Doom', (Sept 5, 2017),< https://www.linkedin.com/pulse/sand-dredging-nigerias-waterways-between-economic-csr-in-action/> accessed August 24, 2024.

77 Mining Review Africa, "Mining in Nigeria: Challenges, Opportunities and Prospects," (September 20, 2023), <https://www.miningreview.com/gold/mining-in-Nigeria-challenges-opportunities-and-propects/> accessed August 15, 2024.

1. Security Concerns

Most mining areas in Nigeria face severe security challenges which include incidences of illegal mining, conflicts within the communities and sometimes banditry. This has made it difficult for investors to venture into the trade as the existing ones are not growing due to the instability in the operating environment.[78] The level of illegal mining of sand in sub-Saharan Africa including Nigeria is unprecedented. These illegal mines are not licensed and recognized by government and this negatively affects the management and control of activities in the sector by the relevant authorities.

2. Inadequate Infrastructure

There is infrastructure gap in the industry. These include the obvious lack of modern facilities and machines, transportation, access to water, power supply, etc. The infrastructure deficit increases the cost of operation and makes mining unattractive to investors.

3. Social and Environmental Effects

The social and environment effects of mining activities in Nigeria already discussed in this paper calls for concern. Poor mining activities, such as the use of unregulated mercury and deforestation have negative effects on the immediate local communities as well as the ecosystem.[79] The use of excessive dredgers has the capacity of destabilizing the ecosystem and this leads to the deepening and ending of the riverbed and other attendant environmental challenges.[80]

4. Lack of Support from Financial Institutions

This is a great challenge in the industry as both the small- and large-scale mining do not have access to funds. Nigerian banks are often hesitant in producing funding in terms of loans to the industry due to perceived risks.[81]

5. Legal and Regulatory Framework

The mining sector or industry in Nigeria has struggled with a complex legal framework. These are cases of inconsistent policies, overlap in the responsibilities of the federal and state government, the stringent land tenure system imposed on Nigerians with the introduc-

78 Abraham (n74), 095.
79 Mining Review Africa (n75).
80 Abraham (n 74).
81 Mining Review Africa (n 75).

tion of the Land Use Act of 1978 have made it difficult for the industry to grow as expected.[82]

6. Poor and Inadequate Monitoring by relevant Government Agencies

There is need for proper monitoring of activities in the sand mining industry. This is very crucial because the implementation of the legal framework largely depends on the effectiveness of the relevant statutory agencies in living up to their responsibilities by ensuring the enforcement of the regulation. Rules that are not enforced will become dead letters of the law no matter how beautifully they have been couched. In Nigeria, most laws are honoured more in breach. The challenge has never been the existence of rules but the lack of political will to enforce or implement existing regulations. Strict enforcement of the legal framework in the sand mining industry is imperative as it will discourage potential defaulter from embarking on activities that would affect resource management and sustainability. It will also lead to the detection, arrest, prosecution and punishment of illegal miners who have operated in the industry unhindered.

7. Absence of the Involvement of Stakeholders in Decision Making Process

There is a clear lack of stakeholders' participation in decision making process in the sand mining industry. The inability to get the input of the local communities has led to resource conflict in Nigeria. The Environmental Impact Assessment Act of Nigeria encourages community participation in decision making on projects that will affect their lives and livelihood. Section 116 of the Mining and Minerals Act already discussed made provision for Community Development Agreement that must consider the input of the Communities affected by mining activities and these Agreements are to be renewed every 5 years. It was also seen that prior to 2023, the CDA had not been effective and a new guideline had to be issued in 2023 to ensure that stakeholders in the industry are captured in all the process in order to eliminate potential conflicts.

G. Way Forward

Nigeria over the years has operated a monolithic economy by depending solely on oil and gas. Investment in other sectors such as small scale and artisanal mining presents an opportunity for the diversification of the economy. Developing this sector will lead to job creation and other attendant social economic and environmental protection. Nigeria's enormous mineral wealth provides a good foundation for economic growth if effectively harnessed. Government must take steps to make the mining sector attractive so investors will be lured to make investments. This they can do by revising existing policies and

82 *Ibid.*

create incentives for investors. The development of local content in the mining sector will promote technology transfer, job creation, and skill development in Nigeria in line with the objectives of the Local Content Act of 2010.

To ensure that the mining industry succeeds in Nigeria, the regulatory framework should be developed and implemented. There is need to have a legislation on sand mining and dredging activities. This will enable the government to streamline and clarify regulations, ensuring there is consistency and transparency. The land tenure system foisted on Nigerians by the Land Use Act must be revisited, providing a clear guideline for community engagement is key to solving a lot of issues that have arisen in mining communities. The introduction of public private partnership in sand mining will lead to infrastructural development that will include access roads, power supply and water.

Security concerns at the sand mining sites should be addressed. Local security groups can be deployed to these sites and be made to write reports on this site to the government on the activities on the sand mining sites. The Ministry of Environment should put a policy in place mandating miners to re-invest and repair old disused mine sites in order to reduce incidences of landslides. There should be a laid down policy on the rate of excavation and sand tonnage allowed from any mining site. This will discourage the excessive extraction of sand from any of the sites leading to environmental hazard. Sand miners must be encouraged to adopt best management practices in order to avoid degradation, environmental pollution and resource conflicts. There should be the promotion of sustainable sand mining activities that will reduce environmental impacts, the introduction of environmentally friendly technologies like the use of dredging machines. This will reduce sedimentation and the restoration of mined areas to their original state.

Finally, community engagement in addressing the dangers of sand mining in Nigeria is invaluable. The local communities must be involved in the decision making process with respect to sand mining in their locality. This will help safeguard their rights and interest and ensure responsible and sustainable sand mining practices. If the communities are involved, they will help in raising the awareness about the social and environmental impacts of sand mining and the promotion and adoption of sustainable best practices in the field.

H. Conclusion

This paper evaluated the legal framework on sand mining in Nigeria, the challenges experienced in the sand mining industry and avenues for improvement. The paper noted that sand mining is a booming industry in Nigeria but predominantly occupied by illegal miners who have exploited the absence of a clearly defined framework for activities in the sector. The paper noted that the Nigerian Minerals and Mining Act of 2007 which is the extant regulation did not specifically address sand mining as a topic in the law but captured sand mining under small-scale and artisanal mining. The provision only mentioned sand in the interpretation section as one of the minerals in Nigeria. It was also discovered that the land tenure system in Nigeria has affected sand mining and there has been cases of violent

conflicts in the sector between the sand mines and the local communities. The paper further discovered that the Community Development Agreement stipulated by law has not been religiously adhered to prior to 2023 as most investors in the industry did not sign up to the agreement and those that signed never bothered to implement or discharge their obligations. It was further noted that the relevant agencies have not been able to regulate the activities of sand mining. The paper further noted the environmental hazards caused by sand mining in Nigeria and the attendant risks that communities are exposed to due to unregulated sand mining activities. The paper also noted the challenges in the sector and made far reaching recommending that will lead to improvements in the sand mining sector in Nigeria and the much-needed diversification in the economy of Nigeria and this will lead to job creation and reduction in vulnerabilities in the sector.

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