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SAND MINING AS A VERITABLE INFORMAL SECTOR ACTIVITY FOR RURAL LIVELIHOOD IN ABAK, AKWA IBOM STATE, NIGERIA.

BY

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ABSRACT

This paper examines sand mining as a veritable informal sector activity for rural livelihood with a view to enhancing sustainable informal sector development in Abak Local government Area of Akwa Ibom State, Nigeria. To generate a data for the study, field reconnaissance survey was done which identified 16 mining sites within 8 communities in Abak. 400 copies of structured questionnaire were distributed to 20 members of the Tippers Businessmen Association 80 sand miners and other stakeholders in the area. This was complemented with focused group discussion with stakeholders in the different communities. It was hypothesized that sand mining is a veritable informal activity that enhanced rural livelihood in Abak. The hypothesis was tested by multiple regression of sand mining component and rural livelihood attributes revealed that the effect of sand mining on rural livelihood is significant as job creation accounted for 0.75, increase in miners' income had 0.55, funding children education had 0.60, early marriage by sand miners had 0.59 and revenue generation for household had 0.64 respectively. Findings on employment status revealed that 60% of miners were engaged on fulltime basis while 40% accounted for part-time. There are marked variations in the volume of sand mined per site ranging from 360-680 tonnage daily in the region. It was revealed that part-time workers take to other informal activities like farming, fishing, trading, carpentry and building to augment for family income. The activities of sand miners in the region are regulated by Association of Tipper Businessmen with legal backing from government. Therefore, this paper recommended that sustainable mining activities should be employed by miners and stakeholders' collaboration with government assistance will attract more informal activities like food vendor for sustainable employment generation in Abak, Akwa Ibom State, Nigeria

Keywords: Sand, Mining, Informal Sector, Rural Livelihood, Akwa Ibom, Nigeria.

INTRODUCTION

The contribution of sand mining to rural livelihood and associated outcomes cannot be overemphasized. Sand mining is veritable informal sector activity for rural livelihood in sub-Saharan Africa as a whole. Artisanal and small scale mining activities in many rural communities provide rural welfare with net benefits on the local economy. There is a phenomenal concern today by many researchers in humid and sub humid economies because of various livelihood opportunities local miners derive from the sector (Abraham and Daniel, 2007; Viju, 2000) It is also recognized that sand mining generally can make significant contribution to socioeconomic development and this is one of the reasons for the persistent interest in this sector around the world.

Sand mining activity is an informal sector activity that offers more opportunities to a wide range of people especially as it requires no formal training at all. Sand mining is a small-scale industrial mining activity with widespread environmental and socio-economic implications in most developing countries (Alhassan, 2010). Developed nations are not left out from this scenario but the magnitude of degradation can be reduced with regulatory measures (Abraham et al, 2018).

The consumption levels of sands have increased tremendously since sands make up the foundational raw material used for developing the world cities and infrastructure. China in 2011 and 2013, consumed 6.6 gigatons of concrete which is more than the United States which used 4.5 gigatons between 1901 and 2000 in the entire 20th century [Swanson, 2015]. Many countries such as Indonesia, Dubai, India, Singapore, among others have increased their demand for extracted sand and globally sands are removed three times, yearly from all rivers and glaciers, more than they can be naturally replaced (UNEP, 2014, Beiser 2017). At this rate, it is estimated that the total annual demand for sand aggregates will rise to 60 gigaton by 2030 [GAIN, 2019].

Informal mining industries that include but not limited to sand mining have brought economic growth and employment opportunities to both wealthy and poor regions; hence it has become a means of livelihood to thousands (Hilson, 2000). Hilson, McQuilken, Perks (2019) stated in the World Bank Report (2019) that small scale mining industry has employed 40 million people worldwide and in Africa estimates accounts for 9 million people and at least a further 60 million are reliant on this industry and this makes it the largest mining workforce.

In a research by Adepelumi and Sanusi (2006), on the behavioral pattern of rural labour work force in Ogun State, the problem of the pattern is intensified by the fact that sand mining

yields immediate profit faster than agriculture for sustained livelihood. Therefore, more people will rationally prefer sand mining to agriculture in such communities.

In Germany, women are not left out in small scale and informal mining activities based on Hentshell (2002); Hinton and Keller(2003), and that the sex composition of mining workers 30% of mining workers are composed of female gender (Hinton and Keller, 2003). Artisanal small scale mining is common to developing countries, like Nigeria, where the populace in the rural areas find it difficult to meet household demands (Oladeji, Thomas, and Ige, 2010).

The effect of sand mining on agricultural land is one of the alternative livelihood activities of the rural people in Nigeria (Aromolaran, 2012). Due to increasing demand for sand in developing countries, sand mining becomes a veritable informal sector activity to many growing communities. Abraham and Daniel (2007) posit that sand miners have formed miners association to improve their welfare and the communities.

According to Rufus (2006), the current economic crisis of the century and financial instability in Nigeria becomes one of the motivators of informal sector activity and concurrently, formal employment shrank has contributed to the high incidence of unemployment, which can be reduced by informal sector activity. Several theoretic and empirical enquiries into the informal sector reveal its vastness, resilience and dynamism. With little or no assistance from government, the units in these sectors have continued to perform creditably. The Nigerian government recently endorsed the informal sector as a vehicle for economic transformation evident from an official pronouncement in the 1991 budget, and is still included till date. (Rufus, 2006). Sand mining is not left behind in this sector especially its significant effect on rural livelihood. In some communities in Nigeria like Ife(Olaninyan, 2003) discovered that about 80% of sand miners were indigenes with other unclassified activities carried out by women in terms of refreshment and food vendor services.

In Akwa Ibom State, sand mining is a vital economic activity that has supported the economic well being of citizens as well as government revenue (Benson, 2009). Inyang (2000) asserts that the importance of sand mining in then South Eastern region cannot be overemphasized and it constitutes lucrative jobs for both men and women.

The increasing demand for jobs and unemployment rise in Nigeria has caused a lot of problems to the citizens especially the unemployed. Job seeking leads to rural-urban

migration leading to an accelerated urban growth up to 30 percent annually in some cases. Jobs were not enough in the urban for seeker and so this population increase results in rise in urban mass unemployment. The consequence of this economic tragedy is relegation of rural communities. Mining operations, whether on a large or small scale have potential impacts on the people's livelihoods as it employs people in the proximity where minerals are being exploited. It is a driver to development as it contributes to per capita income through job creation resulting in improved livelihoods. It boosts the economy of the country through the generation of revenue, an example, being through infrastructure development (Hilson, 2009, Horsley, Prouts and Tonts, 2015). The mining sector creates a pool of opportunities that can be relied on by the county government for socio-economic development and the creation of wealth. Artisanal Small-Scale Mining (ASM) has got a major potential in reducing poverty and contributing to sustainable development. ASM is when miners not officially employed by mining companies work independently by hand, using their own resources. ASM provides vocational jobs across the globe which represents the livelihood of the poor communities. Income generated by ASM tends to be spread and spent mainly in the local economy and has a significant impact economically and developmentally at the local level, in contrast to large-scale mining which directs much of its income to overseas shareholders or banks (O'Faircheallaigh and Corbett, 2016). Extraction processes rarely consider social and environmental sustainability for the benefit of future generations (Baru and Moronge, 2018). Mining has been blamed globally for harmful and impoverishing effects. The governments are expected to regulate mining in a manner likely to attract investors and at the same time protect the interests of local communities [11]. This paper illustrates the need for a robust informal sector that has been lately recognized in the discipline of geography.

Having perceived the significant role played by sand mining in transforming the economy, there has been a shift in development research studies and policy towards a more holistic views of the activities and capital assets that household draw into make a living. Sand mining subsector in an informal platform cannot be complete without women. Women constitute a significant proportion of the labour force in artisanal small-scale mining and involvement in artisanal small scale mining can take place at all stages of mining production and value chain.(Efitimie, Heller, Hinton, Lahiri-Dutt, Mutemeri, Insouvanah, Sambo, Wagnar , 2012)

Recent studies have shown that rural economies are not only based on agriculture. Apollo et al (2017) stated that most of the small-holder farmers engage in artisanal mining during dry seasons to gain income for their agriculturally based livelihood in Africa. Kamlongera (2013) in his study on ASM in Tanzania, he opined that ASM has been the solution to growing

unemployment among youth and provides income-earning opportunities for both men and women in a variety of occupations.

Sand mining underpines the development engine, so without sand the construction industry will come to a halt (Pereira, 2012). In places like India, the boom in the construction industry in the last decade has triggered a huge demand for sand. India's need for space and infrastructure is driven by its fast increasing population. Since 2000, India's population has increased over 300 million people, while its urbanization rate increased from 27.4% to 32.8% in 2017 (World Meters, 2018). Finn (2014) observed that sand mining was the major occupation of young men in Sierra Leone. Stating that over 200 people were actively being employed in Bessberry village of Sierra Leone.

A study conducted by Akanwa (2020) in Anambra revealed that sand mining generates jobs and expands the income of mostly youths in the community. The economic potentials and contribution of sand mining especially towards poverty alleviation and rural development in Okija has been noted. Johnbull and Brown (2017) stated that the Socio-economic Consequences of Sand Mining along the Victory River in Port Harcourt, Nigeria include employment, creation of revenues for rural communities and negatively affect the river since it's informal and not regulated. As pointed out by social and environmental activists, there are potential linkages between natural resources and the environment where they are found in abundance which is mined on a large scale around the world (Pearce, 2019). Ituen, Udom and Johnson (2019) assessed in Akwa Ibom State the sustainable land resource management of sand. From their study, sand mining degrades land and there is need to manage sand mining activities irrespective of the gains with strict model of environmental friendly consciousness.

The aim of this research is to assess the contribution of sand mining as a veritable informal sector activity to rural livelihood in Abak by identifying sand mining communities and the respective sites, examining the benefits of sand mining to rural livelihood, identifying associated problems with sand mining activity with the view to enhancing sustainable livelihood.

2. CONCEPTUAL FRAMEWORK

2.1 CONCEPT OF SUSTAINABLE INFORMAL SECTOR ACTIVITY IN SAND MINING OPERATIONS.

Informal sector as a concept is multifaceted and multidimensional because its characterization has remained vague and slippery and reflects a wide range of interpretation of findings of research in the sector (Abumere, 1995). Although there has been much thought on the

conceptualization of the informal sector, no consensus has been reached by one way of definition (Rufus, 2016). In 1973, Hart in his study of urban poor in Ghana first used the concept informal sector which he defined it as any activity where income is derived from self-employment. Informal sector comprises of small-scale units producing and/or distributing goods and services from profits, pay or communal and social wellbeing without official regulations guiding their operations and, usually without being recorded in official statistics (Rufus, 2006). The characteristics of informal sector activity viz: non-application of legal and administrative regulations, fragility of institutional framework, crude methods and tools for operations, nonuse of technology and semi-permanent character of the activity becomes an area of concern in geographic researches. Exploitation and utilization of resource is not the problem but the limitations in sustainable usefulness of the resource. Despite the fact that it is an informal sector activity having kept to the criteria for becoming classified under this sector, the concept of sustainable development cannot be overemphasized.

The concept of sustainable informal sector activity has not been considered importantly in literatures. This fragility has caused a lot of problems to both the environment and the community because illegality leads to over-exploitation. Dreschler (2001) asserts that, the concept of sustainable development seeks to increase awareness of how finite resources such as minerals (e.g sand) would be preserved and at the same time support livelihood.

According to Stewart (2013), the extraction of sand from the environment in the absence of a regulatory system could easily participate the classical dilemma described by Hardin in 1968 as the tragedy of the commons'. In this dilemma, a natural resource that is used collectively by a community can be rapidly depleted if individuals within that community act selfishly and use more than their fair share of the resource to the detriment of the community as a whole (Stewart, 2013). The concept therefore is intended to embrace the idea of ensuring that future generations inherit on earth which will support their livelihoods (David and Giles, 2014). Any activity that raises social welfare with maximum amount of resources conservation and minimum amount of environmental degradation allowable within given economic, social and technique constraints is sustainable development (Barrow, 1994). Therefore, informal sector activity should be re-conceptualized towards this aspect which is the recent trend.

Sustainable informal sector activity brings together two concepts "sustainability" and "informal sector activity". That is none is relegated but there exist an integrated approach in operations. This concept states that every informal sector activity should be of economic value and have the capacity of maximizing livelihood improvement and minimizing depletion and short term benefits. The aspect of sustainability in the informal sector is aimed at providing a workable tool to enhance the activity of this sector with respect to intergenerational benefits and long term capacity to satisfy beyond the present. it is imperative to put in place mechanism for planning and

monitoring the growth and efficient functioning of the sector (Rufus, 2006) without compromising its value in subsequent generations.

2.2 CONCEPT OF SUSTAINABLE LIVELIHOOD IN INFORMAL SECTOR PLATFORMS AMONG MINERS

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living (Acheampong & Campion, 2013). Sand mining can contribute substantially to improving the livelihood of miners in areas such as food security, employment creation, income generation, increased well-being, reduced vulnerability, among others.

Sustainable livelihoods are those that can cope and recover from stresses and shocks, maintain, and enhance local and global assets, on which livelihoods depend, imparting bequests and opportunities for future generations (Carney, 2002). Livehood assets are the resources on which people draw in order to carry out their livelihood strategies (Farrington, Ramasut & Walker, 2002). Messer and Valarina cited in Oelofse and Hough-Jensen (2009) describe the aim of the Sustainable Livelihoods Framework as a tool for understanding how household livelihood systems interact with the outside environment – both the natural environment and the policy and institutional context. A framework such as this should be considered as an analytical structure for guiding our thinking – understanding the complexity of rural people's lives and understanding the importance of upper level transforming processes and how they interplay with livelihood assets.(Oloefse and Hogh-Jensen, 2009). Sand aggregates are livelihood assets from nature harnessed by miners without regulatory framework lately especially in developing nations.

METHODOLOGY

STUDY AREA – GEOGRAPHIC SETTING OF THE STUDY AREA

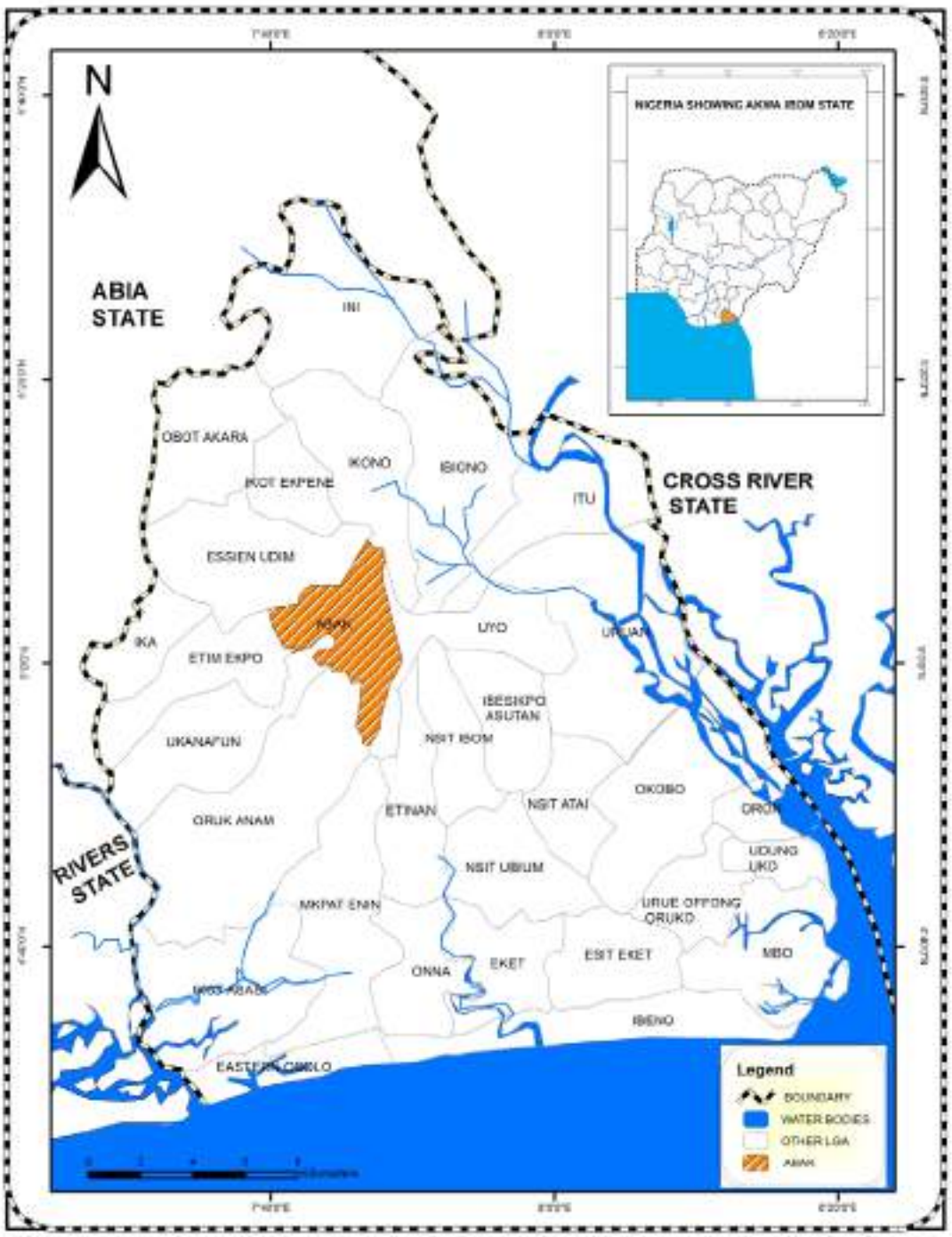
Abak lies between latitude $5^{0}07^{1}$N and $5^{0}49^{1}$E and longitude $7^{0}40^{1}$E and $7^{0}49^{1}$E. it is located in the south western part of the state bounded on the North by Essien Udim Local Government Area, on the East by Uyo and Etinan Local Government Areas and on the west by Etim Ekpo Local Government Area.

The climate of Abak is influenced by two marked seasons viz: the wet and dry seasons. Heavy rainfall spread over eight months of the year. The mean annual rainfall is between the rainy season begins in March and last till October or early November. The heaviest rainfall months are July and September. The dry season is marked by high temperature and sunshine. It is always very hot. It comes up between November and February. The two air masses influencing these seasons are tropical maritime and tropical continental air masses. The former gives way to rainy season and the later dry season.

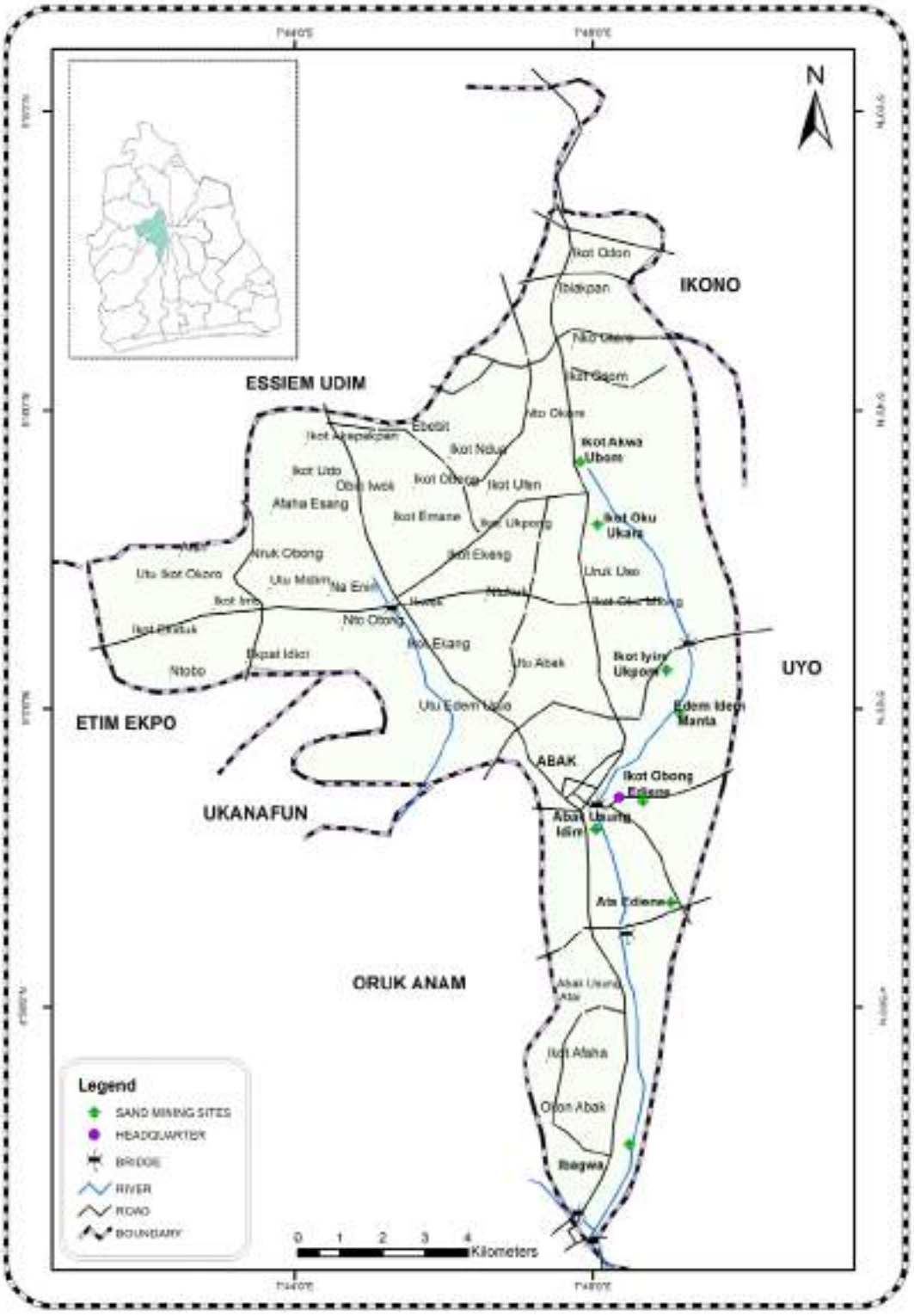
The study area lies within the subtropical rainforest vegetation zone and also within the oil palm vegetation belt. The entire vegetation has large expanse of land full of oil palm trees and other trees that thrive on the area are both tall and short trees at some places where urbanization does not dominate. The influence of human activities has greatly shaped the virgin vegetation cover. The soil of Abak is coastal plain sand with little deposit of clay and loam which supports cultivation.

The landscape is undulating thereby rising gradually and lies between 0 and 200 meters above sea level. Although this area is low and undulating terrain due to its topography, there is flooding. The stream at Ediene-Abak, midim which is a tributary of Enyong creek runs into Ibagha River and finally drains into Kwa Iboe river.

Abak local government area covers an area of about with a population destiny of 465 per square kilometer. The population of the area according to NPC (2006) was 139,090. Their settlement patterns are both linear and nucleated. The people of the area belong to Annang stock being one of the three major dialectical groups and the second most populated in the state. It is highly economic with specialization in agriculture, local production and artisanship, sand mining, commercial venture and administrative function. This area has a good arable land in which crops like oil palm trees (elaies guineensis), cassava (manihot utilisima), yam (Discorea spp), raffia (raphea vinifera), coconut (cocos nucifera), and maize (zea mays) and waterleaf (talinum triangulare) thrive very well. Palm produce especially takes the lead on production.



AKWA IBOM STATE SHOWING STUDY AREA (ABAK)



ABAK SHOWING SAND MINING COMMUNITIES

3.2 DATA SETS AND SOURCES

The data for the research was obtained from field reconnaissance survey complimented with distribution of 400 copies of structured questionnaire, were distributed to 20 members of the Tippers Businessmen and 80 sand miners and other stakeholders in the region. Discussion with focused groups and stakeholders generated additional data for the work.

DATA PRESENTATION AND RESEARCH ANALYSIS

(a) Table 1: Socioeconomic Characteristics of Respondents

S/N	CHARACTERISTICS	FREQUENCY	PERCENTAGE
1.	SEX		
	Male	248	62%
	Female	152	38%
	400	100	
2.	MARITAL STATUS		
	Married with children	171	42.75
	Married without children	47	11.75
	Single	98	24.5
	Divorce	33	8.25
	Widowed	51	12.75
	Total	400	100
3.	AGE		
	15-20	28	7
	21-25	92	23
	26-30	150	37.5
	31-35	100	25
	36 and above	30	7.5
	Total	400	100
4.	EDUCATIONAL LEVEL		
	Informal	77	19.25
	Primary	133	33.25
	Secondary	120	30
	Tertiary	70	17
	Total	400	100
5.	OCCUPATION		
	Civil servant	41	10.25

	Farmers	88	22
	Sand miners	100	25
	Students	99	24.75
	Traders	72	18
	Total	400	100

Source: Field survey, 2020

The above data for sex reveals that 62% are male while 38% are females; for marital status 42.75% are married with children, 11.75% are married without children, 24.5% are single while 8.25% and 12.75% are divorce and widowed respectively; for age 37.5% fall between 24-30, 25% between 31-50, 23% between 21-25, 75% between 36 and above and 7% between 15-20; for educational level, 33.25% have primary education, 30% secondary, 19.25% informal and 17% tertiary; for occupation, 25% are sand miner, 24.75% are students, 22% are farmers, 18% are traders and 10.25% civil servant.

(b) Table 2: Sampled Sand Mining Communities in Abak

S/N	COMMUNITIES	NUMBER OF MINING SITES	PERCENTAGE
1.	Abak Usung Idim	4	25.00%
2.	Ikot Iyire Ukpom	1	6.25%
3.	Edem Idem Manta	2	12.5%
4.	Ibagwa	1	12.5%
5.	Ikot Akwa Ebom	1	6.25%
6.	Ata Ediene	3	18.75%
7.	Ikot Oku-Ubara	2	12.5
8	Ikot Obong Ediene	1	6.25%

The table above shows that 25% of the sites are at Abak Usung Idim, 18.75% at Ata Ediene, 12.59 at Ikot Obong Ediene and Ikot Iyire Ukpom.

b) Table 2: Scale of Sand Mining in Abak, Akwa Ibom State, Nigeria

SCALE OF MINING	CRITERIA FOR SCALE OF MINING	AREA
LARGE SCALE	Use of excavator and	Ikot iyire Ukpom, Edem Idim Manta, Ibagwa, Ikot

	dredgers with over 10-20 workers	Akwa Ebom, Abak Usung Idim
MEDIUM SCALE	Use of canoe, spadeand wheel barrow with miners between 7-10	Ata ediene, Ikot Obong Ediene
SMALL SCALE	Use of bucket, spade, and wheel barrow with 1-6 workers	Ikot Oku Ubara

Table 4: sand mining daily output at different sites

SITE	DAILY OUTPUT	PERCENTAGE
1	525	6.25%
2	600	6.25%
3	420	7.15%
4	500	5%
5	680	5.96%
6	460	8.1%
7	500	5.48%
8	390	5.96%
9	415	4.65%
10	398	4.95%
11	658	4.7%
12	399	7.84%
13	575	4.75%
14	500	6.85%
15	360	5.96%
16	475	4.29%
Total	38395	100

From the data analysis above Abak produces 8395 tonnage daily with the highest percentage of 8.1% at site 5 in Ikot Ukpom and the lowest at 429% at site in Ikot Oku –Ubara. Other sites with higher percentage are site 1 (Ata Ediene), site 2 (Abak Usung Idim), with 7.84% and 7.15% respectively.

Table 5: Employment Status of Miners

Status	No. of miners	Percentage
Partime workers	60	38.7%
Full-time workers	95	61.3%
Total	155	100

From the data above, 61.3% of miners are full time while 38.7% are part time

Table 7: Other activities carried out by part time miners

Activities	Frequency	Percentage
Formal	15	25%
Informal	45	75%
Total	45	100

The result of the above table reveal that 25% of the partime workers are also involved in formal activities and 75% of them are into informal activities.

Table 8: Informal activities among part time miners

Activities	Frequency	Percentage
Farming	95	23.75%
Fishing	26	6.5%
Trading	100	25%
Carpentry	87	21.75%
Building	92	23%
Total	400	100

From the data above, 25% of the respondents say that pert time miners engage in trading, 23.75% says that they engage in farming, 21.75% accounts for carpentry, 23% for building and 6.5% accounts for fishing.

Therefore, out of the 75% of informal activities, 25% the respondents accounts for the trading activities which take the lead.

Table 9: INDICES DETERMINING SAND MINING ACTIVITIES AS INFORMAL SECTOR ACTIVITY

INDICES	FREQUENCY	PERCENTAGE
Simple technology	40	10%
Small scale	27	6.7%
Apprenticeship system	100	25%
Internal financing	150	37.5%
Incentives and accumulation	25	7%
Reliance on personal relations	55	13.75%
Total	400	100

The data above show that 37.5% respondents agreed that internal financing is one criterion that determines sand mining as informal sector activity, 25% agree that Apprenticeship system determines, 13.75% agree that Reliance on personal relations determines, 10% account for simple technology, 7% accounts for Incentive and accumulation and 6.7% accounts for small scale production.

Table 10: ATTITUDE OF MINERS TO WORK

ATTITUDE	FREQUENCY	PERCENTAGE
Always	105	26.25%
Frequently	143	35.75%
Regularly	152	38%
	400	100

The data above shows that 38.00% of the respondents said that miners go to work regularly, 35.75% said they frequently and 26.25% said always.

Table 11: Number of Indigenous and Non-indigenous Miners

Miners	Number	Percentage
Indigenous	143	
Non-indigenous	12	
	155	

Table 12: Membership in the Association of Tipper Businessmen

Miners membership status	Number	Percentage
non-member miners	135	87
Member-miners	20	13
Total	155	100

Table 13: Benefit of Sand Mining to Rural Livelihood

Benefits	Frequency	Percentage
Job creation	84	21%
Income provision	82	20.5%
Early marriage	70	17.5%
Social services	63	15.75%
Funding children Education	50	12.5%
Skill development	51	12.75%
Total	400	100

Table 14 Factors Influencing Sand Mining Impacts

Factors	Frequency	Percentage
Seasonal Variation	40	10%
Acessibility	27	6.7%
Marketing competition	146	36.7%
Demand	160	40%
Socioeconomic characteristics	27	6.7%
Total	400	100

Table 15: How to Enhance the Performance of Sustainable Mining in Abak

Variables	Frequency	Percentage
Income improvement	51	12.75
Favorable working environment	84	21
Skill upgrading	63	15.75
Market protection	82	20.5
Literacy programme	45	11.25

Institutional support	77	19.25
Total	400	100

Table 16: Showing Types Of Sand Mined Daily

PRODUCTS	PERCENTAGE
General sand	35%
Smooth sand	5%
Latenite	20%
Sharp sand	40%

The table above shows that 40% of sharp sand is mixed daily, 35% of general sand is mixed daily, Laterite Account for 20% and smooth sand 5%

Table 17 Methods of Sand-Exploitation in Abak, Akwa Ibom state

Sand mining method	Frequency	Percentage
(mechanical) Dredging	152	38%
(use of hoes and canoes) manual	208	52%
Both dredging and manual	40	10%

The above show that dredging accounts 38%, manual 52% and both at a side, for 10%

Table18: Showing Seasonal Influences to Sand Mining

Activity	Rate of sand mining high	Rate of sand mining low
Rainy seasons	76	85
Drying seasons	190	49

The table above shows that there is high level of sand mining during rainy season because sands are deposited at the river basin after every rainy day while at dry seasons sands are less deposited. Mining it is a bit low during dry season.

3.3 RESEARCH HYPOTHETICAL ANALYSIS

Hypothesis:

Ho: There is no significant effect of sand mining on rural livelihood

HI: There is.

MULTIPLE REGRESSION ANALYSIS OF SAND MINING COMPONENT AND LIVELIHOOD COMPONENTS

From the results of the multiple regression analysis, sand mining contributes to job creation (r= 0.75; p<0.05), revenue generation (r= 0.64, p<0.05), early marriage (r= 0.59: p<0.05), funding children education (r= 0.60, p<0.05), increase in miner's income (r= 0.55, p<0.05). from the analysis of variance, the multiple regression had a significant value less than 0.05, showing that the effect and relationship is significant. It contributes more to job creation.

Effect of Sand Mining on Job Creation on Job Creation

R	R Square	Std. Error of the Estimate
.75	.563	.122

Effect of Sand Mining on Revenue Generation

R	R Square	Std. Error of the Estimate
.64	.41	.238

Effect of Sand Mining on Early Marriage

R	R Square	Std. Error of the Estimate
.59	.348	.145

Effect of Sand Mining on Funding Children Education

R	R Square	Std. Error of the Estimate
.60	.36	.332

Effect of Indoor Sand Mining on Increase in Miner's Income

R	R Square	Std. Error of the Estimate
.55	.303	.221

SUMMARY OF FINDINGS

The study has examined the effect of sand mining as informal sector activity on rural livelihood.

The results of the findings show how informal is sand mining activity based on the method of operation which is mainly manual, the attitude to work, where some miners were part time and some related activities. The methods and operations of mining is not highly legalized.

Therefore, there is a fragile institutional frame work that regulates mining operations. The involvement of indigenes is higher and this is in support of Olaninyan (2003) personal observation which reveals that tipper drivers, loaders and food sellers around the mining sites make daily earnings from activities, benefit from mining and sand mining becomes very active when these other ones associates. This is a form of spatial interdependence. Due to road infrastructure network at some mining areas like Ukpom mining activity is very high and productive. However, some areas still mine despite transport challenges.

The demand rate has influenced the rate at which sand is supplied because sand provides a lot to the rural and urban people like: road construction, building, land reclamation and other industrial activities. During rainy seasons, sand mining is highly productive because the river and water movements at this time due to rainfall that enhances transportation and deposition of sand. Findings also reveal that 40% of sand miners in the area have permanent residences from sand mining and many use the money to develop other sector activities.

- RECOMMENDATIONS

Based on the results and findings of this research, the following recommendations are hereby offered:

1. There should be improvement in road infrastructure network at some mining sites to enhance mining operation. This could be done when government provide accessible roads to the sites which would help in increasing productivity.
2. Erosion at mining sites should be controlled as a strong environmental problem so as to foster effective and productive mining operations.
3. Institutional frameworks should be provided and implemented to develop the informal sector of the Nigerian economy which could help in solving both rural and national economic challenges.
4. Legalization and regulation of mining operations should be done according federal environmental protection agency laws to ensure sustainable mining activity which is pivotal to sustainable rural livelihood. This would alleviate intergenerational poverty such that subsequent ages would also come to benefit from the resource because this resource is fundamental to development.

5. Basic amenities should be provided like water supply, schools, health care to enable development of miners and also improvement of livelihood in the area.

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