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ASSESSMENT OF ECOLOGICAL DEGRADATION AND ASSOCIATED IMPLICATIONS IN SOUTHERN AKWA IBOM STATE: WHY ACTIONS NEED TO BE TAKEN.

Abraham C.M[1], Evelyn P.A[1], Eyo E.E[1], Ibanga, I.J[1]Ebong.M.S[1] Jimmy U.J[2], Udo,W.M[3] Umana, S. U[4],

[1]Department of Geography and Natural Resources Management, University of Uyo, Nigeria
[2]Centre for Wetlands and Waste Management Studies, University of Uyo, Uyo
[3]Department of Plant Biology and Biotechnology. Environmental Plant Physiology/Phyto-remediation. Faculty of Life Science, University of Benin, Edo State
[4]Department of Geology, University of Calabar, Calabar

Corresponding Author email: Comfortabraham@uniuyo.edu.ng,

ABSTRACT: This study was carried out in Southern part of Akwa Ibom State with a view to unveiling the ecological problems prevalent in the region and its associated implications. Seven Local Government Areas within the region were selected for the study. Two (2) villages in each Local Government were further sampled making a total of 14 villages. The study employed both descriptive and quantitative method of data analysis. Twenty-eight (28) structured questionnaires out of 392 were distributed to Fourteen (14) communities, together with personal interview conducted at the sampled communities. SPSS manipulation using multiple regression analysis revealed that the Southern Akwa Ibom State is heavily endowed with natural resources and in the quest of harnessing the resources, a wide variety of ecological problems emerged such as oil spill, forest destruction, gas flaring, water pollution, air pollution, open defecation, ground water contamination, soil acidity and biodiversity loss. The study further noted that given the ever-increasing ecological degradation, the livelihood and socio-economic status of the region have been modified, jeopardized or absolutely destabilized with poor crop yield, fishery loss, soil infertility and land contaminant. It was however recommended that an impact prediction and proper assessment of anthropogenic activities including mineral and non-mineral exploitation within the area be carried out. This is with a view to touching essentially on the change brought about by anthropogenic

activities including, sand dredging, deforestation, gas flaring as well as oil spill which subsequently impact upon agricultural productivity and environmental resources in the region. Also, all the key stakeholders in the various companies operating within the region including oil and gas industry should inject some funds and re-direct their attention toward effective ecosystem management for improved livelihood sustainability.

KEYWORDS: Ecological problems, Degradation, Implications, Actions, Southern Akwa Ibom State, Nigeria

INTRODUCTION

Ecological degradation is a global phenomenon. Over the years, the fallout of this ecological dis-equilibrium results in ecosystem instability with dire consequences on life support system for sustainable livelihood with a more escalating effect in rural communities (Liberty, Ugwushiwu, Bassey and Eke, 2013; Milupi, Somers, Ferguson, 2017). The Southern region of Akwa Ibom State is a doldrum for intense human and natural interface due to the presence of petroleum and associated resources (Ukpong, 2009; Uwemedimo, Christopher, Sunday, Otu and Nsikan 2014). The high population concentration in this region and concomitant natural resources exploitation viz a viz petroleum has caused a serious threat that affects the ecosystem stability and economic productivity. The Southern part of Akwa Ibom State comprises of Ikot Abasi, Eastern Obolo, Mkpat Enin, Onna, Nsit Ubium, Eket, Esit Eket, Ibeno, Mbo, Urue Offong Oruko, Udung Uko, Okobo and Oron LGAs, and has abundant mineral resources including crude oil and related minerals. Other resources found in the area include fisheries, wetlands, food crops, sand, clay, aluminium, laterite and forest resources scattering all over the entire region. The region also has the largest sand beach in West Africa about 1200km^2, the proposed Ibaka Deep Sea Port and unquantifiable tonnes of fisheries. As a result of her rich endowment, it has attracted a great number of tourists, investors and myriads of those in search for job opportunity. As the population of the region increases steadily coupled with the human activities done in the area, ecological degradation has increased correspondingly. The Southern part of Akwa Ibom State is characterised by the coastal environment as its geographic location is bounded by the Atlantic Ocean. Its proximity to the ocean influences the occurrence of diverse environmental disasters in the adjoining environment. Ecological degradation takes multiple forms in the southern part of Akwa Ibom State including coastal flooding, soil erosion, deforestation, gas flaring, mining, oil spill, noise pollution, water pollution, open defecation, air pollution among others. According to Usoro and Akpan (2010), the region is characterised by

the Atlantic Ocean shoreline and surfbeach, beach ridge, mangrove swamps and flood plain covering an extensive part of Imo River at Ikot Abasi, the Kwa River estuary at Eket, the Cross river estuary at Oron and the Ibeno Beach at Ibeno. This region is naturally endowed with abundant resources not limited to sand/gravel, fisheries resources, forest resources, mineral resources, agricultural resources, wetland soil and water resources but the resources are either not fully harnessed or its exploitation threatens the immediate environment. The region harbours the Kwa Iboe River Swamp which is characterised by Avicenna africana plant, rhizophora species as well as the stubb creek segment dominated by Nypa fruticans. Meanwhile, the Imo river swamp and the Cross River swamp also accommodate a wide variety of biodiversity although human activities within the ecological zone are perpetually degrading the fragile ecosystem.

In addition, the stubb creek forest which was the largest gazetted forest reserve in Akwa Ibom State was found in this region but due to human activities through hunting, lumbering, wine production, boat building, farming and many others, a larger part of this protected ecosystem has been degraded drastically (Akpabio, 2013).

Regarding the management of the ecologically degraded areas studies conducted by numerous scholars including Nwankwo (2015), Gbemre (2014) and Afonughe and Mukoro (2017) had hinted on the necessity for a mutual understanding between the local people, the government and multinationals operating the region. It is through such alliance that sensitive issues bordering the local people can be addressed. Another study conducted by Ebierikpe (2016) stressed on effective implementation of ecologically-sensitive development plan, promote research on natural resources and exploitation and exploration, adequate compensation, stringent sanction, periodic ecological assessment as well as all-inclusive ecological restoration in the affected region in Southern Akwa Ibom State. The study aimed at assessing ecological problem causing degradation of Southern Akwa Ibom State environment, Nigeria in order to revamp the region to normalcy.

Statement of the Problem

Ecological degradation is multifaceted and multi-dimensional in scope and involve natural and human-induced stressors acted upon the surface of the earth especially Southern Akwa Ibom State, Nigeria. Ecological degradation has the capacity to deteriorate environmental quality and destabilize its equilibrating conditions (Abraham, 2018). These problems are not limited to soil erosion, flooding, deforestation, bush burning, landslide, soil flow, mining, pollution but also

fishery loss, soil infertility, wildlife extinction and biodiversity loss. Ecological problems are abnormalities that threatened environmental health and thus, reduce its productivity. These problems degrade the physical environment in Southern part of Akwa Ibom State. Like other regions in the state is extremely undergoing series of modification primarily caused by human activities. The region is facing one of the highest rates of deforestation around Esit Eket, Eket, Oron, Ikot Abasi, Mkpat Enin and many other places. It is also the same region influenced by petroleum exploration issues including gas flaring, oil spill, groundwater pollution, soil contamination, fresh water pollution, open defecation, aquatic life disturbance, air pollution and the associated health implication. As a result, these problems have generated enormous negative influence on the socio-economic development and livelihood of the inhabitants. Exponential increase in population in consonance with huge outlay of resources has rendered some population jobless with high poverty level. Overdependence on nature has high rocketed effect on human pressure on available resources. Poverty is synonymous with intense environmental degradation. The once fertile farmlands are no longer suitable for use, the local streams have been flooded with oil spill and toxic substances, the fisheries are either contaminated or completely death on daily basis, mangrove swamp forest with all its essentials are gradually devastated and thus paving way for greater environmental problems in the near future. It is as a result of these environmental challenges affecting local communities in Southern part of Akwa Ibom State, that this study seeks to investigate the following; the ecological problems prevalent in Southern part of Akwa Ibom State, the Implications of the identified problems on the environment, community-based responses on ecological problems in the study area and ways of curtailing the identified problems in Southern part of Akwa Ibom State

Literature

Ecological Problems in Southern Akwa Ibom State

Since the discovery of oil at Oloibiri in Rivers State in 1956, Niger Delta has been severely tampered with ecologically. Niger Delta harbours nine states including Akwa Ibom State. The Southern fringes of Akwa Ibom State which is the study area have been degraded despite the benefit derived from the region. Some of the ecological problems in Southern Akwa Ibom State are discussed below:

(i) Deforestation

Human interference on fragile forest ecosystem has led to severe deforestation scenario. It is widely noted that trees in the forests help in maintenance of soil fertility through litter fall and protect the soil as well as retard water flow from rain hence reducing soil erosion (Popoola, 2016; Nze, 2012; Ogundele Oladipo and Adebisi, 2016). Deforestation has become one of the major issues bordering Sub-Saharan Africa, Nigeria inclusive due to various anthropogenic impact on forest including the demand for fuelwood, urbanisation, pressure physical planning and infrastructural development, struggle over land ownership, land grabbing among others. Following this threat, other environmental hazards including flood, soil erosion and landslide has emerged which tends to worsen environmental quality. Deforestation leads to soil loss, pollution and disruption of the hydrological cycle, which result to the loss of habitat for plants and animals in Nigeria and other Countries in Sub-Saharan Africa (Atanda, 2018). Southern Akwa Ibom State which comprises more than 7 Local Government Areas is currently facing challenges of land cover changes triggered by fuelwood extraction, timber and non-timber exploitation and uncontrollable felling of trees for diverse uses. This is worsened by the extreme competition and the rising cost of timber and non-timber product for these products in major urban centres within the three (3) senatorial districts of the State: Uyo, Ikot Ekpene and Eket. Studies have also shown that numerous communities and families that had planted, tended and protected homegardens, mangrove, community forest and sacred groves are gradually depleting the once rich ecosystem for one reason and the other mostly on economic grounds (Udofia, Akpan-Ebe, Uluocha and Ekpoh, 2011; Nikijuluw, 2018).

(ii) Oil Spill on Land and Water

Exploration and exploitation of oil and gas in Akwa Ibom State notably Ibeno, Eket, Esit Eket, Onna and Ikot Abasi have unleashed terrible environmental problems in the region. One of the most devastating fall-out from oil and gas industries is oil spill. Oil spill has polluted local streams, destroy biodiversity, degraded forest, killed aquatic life and contaminated ground water and farmland in Upenekang, Iwuchang, Atabrikang Uta Ewa, Ikot Akpan, Iko Town and neighbouring communities. Oil spills include releases of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products (such as gasoline, diesel) and their by-products, and heavier fuels used by large ships such as bunker

fuel, or the spill of any oily white substance refuse or waste oil (Babatunde, 2020; Eze, Akpomie, Ezeofor, Mmadubuike and Ofor, 2019). Oil spill as an ecological problem is one of the greatest environmental issues in the entire Niger Delta region. Akwa Ibom State initially seemed to have taken this scenario so lightly until when it began to destroy marine and terrestrial agro-environment. A greater number of oil producing communities in Southern Akwa Ibom State have completely lost their naturally hygienic and safe streams, fishes and other marine organism, wild animal, cultivable land, forest and many other essentials of livelihood. Several studies conducted by scholars all over the country including (Ndeh, Okafor, Akpan, Olutoye, and Ohieku, 2015; Osuagwu and Olaifa, 2018) have buttressed the fact that oil spillage is a threat to sustainable community livelihood. It has deprived the locals of their basic rights such as health due to loss of essential herbs, access to food, clean water as well as livelihood changes at its critical condition. It has led to the loss of mangrove forests, loss of farmland**,** depletion of fish populations**,** marine water contamination, fresh water and groundwater contamination and many others (Amnesty International,, 2018; Daminabo and Frank, 2015). Oil spill has come to stay in Niger Delta and the adjoining regions despite intervention agencies. Many communities in the region are counting their losses on daily basis. If actions are not taken in the study area earlier discussed, there is possibility of replicating the Ogoni land- Obagi-Ahoada experience as related to oil spill by Shell Petroleum and Totalfina-Total Oil, Rivers State, Nigeria.

(iii) Gas flaring

Gas flaring is a serious environmental problem in Southern Akwa Ibom State in Niger Delta region. The flaring involves the controlled burning of natural gas that is associated with crude oil in the course of routine oil and gas production operations from gas fields nonstop (Abua and Ashua, 2015). The process is a multi-billion dollar waste, a local environmental catastrophe and a global energy and environmental problem which has persisted for decades particularly in the Niger-Delta region of Nigeria notably oil field like Eleme and Abagi in Port Harcourt (Ismail and Umukoro, 2012). Gas flaring has negative effects on the immediate environment, particularly on the diversity of plants and wildlife fauna. Gas flaring in Mkpanak, Akwa Ibom State is wastage of valuable resources much needed for domestic and industrial use which could have helped in socio-economic development as well as consolidating the energy sector (Ubani and Onyejekwe, 2013). Nigeria as a country does not have the needed capacity to completely eradicate gas flaring due to infrastructural failure, managerial inefficiency and policy somersault. Chilaka (2009), from his study stated that the Nigeria gas market lacked adequate infrastructure to

produce natural gas and that a considerable quantity of the produced gas is flared. The cost of domestic gas in Niger Delta is very expensive and most poor people cannot afford because a considerable quantity of gas that should have been channel into domestic consumption are flared. The long awaited sustainable approach in oil and gas sector which is zero-flaring and gas injection is yet to be actualised in Southern Akwa Ibom State where oil wells and tank farm are predominant. Temperature increase, fall-out from flared gas result in increase toxicity in soil, series of health challenges-cancer, bronchitis, catarrh etc.

(iv) Open defecation

The issue of open defecation in Nigeria and Sub-Saharan Africa has become a priority among various government agencies, international organisations and NGOs. The coastal areas are widely known to be the major hotspot for open defecation by the virtue of its proximity to the sea and the need to secure comfortable sanitary facility is not considered (David, Ndukwu and Obafemi, 2019; Saleem, Burdet and Vattealip, 2019). The rural dwellers in the coastal environment dispose off their faecal waste directly into water bodies. According to JMP Report (2015), 45.738 million people in Nigeria were defecating in the open especially the coastal fringes where there is no or inadequate toilet facility and thus feaces are empty directly into the sea. Access to improved sanitation in Nigeria has declined over time. Between 1990 and 2015, the WHO/UNICEF Joint Monitoring Program data reveals an 8% decrease in access to sanitation in rural areas and 3%decrease in access to sanitation in urban areas. The decline in access to toilet facility is further jeopardised by a wide spread poverty (Nallari, 2015; Akpabio and Udofia, 2016; Giribabu, Bharadway, Sitiraju, Buna, Rao and Reddy, 2018). The decrease in sanitation condition in Akwa Ibom State and elsewhere can be traceable to the government loss of focus on environmental sanitation as well as poor monitoring of sanitary facilities among household which was previously implemented in the 1980s and1990s. Places like Akwa Ibom State during such time took the lead in environmental monitoring and sanction of defaulters on issues of sanitary facilities in both rural and urban centres. Such an attempt contributed to the increase in quality sanitary facility accessibility among household, such initiative has been abandoned and this underlies the reason for poor sanitary facility and sanitation practice in the region. In Ibeno beach and the adjoining coastland open defecation is the order of the day where modern toilet facilities are not built. Defecation is in the coastal fringes and sea side such as Udung Uko, Mbo, Oron, Urue Offong Oruko, Ibeno, Esit Eket and Eastern Obolo and Eket. Open defecation contaminate air, land and water environment with dire consequences on environment.

Environmental Pollution

Environmental pollution has always posed a serious issue on the health of the environment. Various degradative sources of pollutant include fumes from vehicles, gases from industries, smoke from factories have been identified in the Southern Akwa Ibom State. Government and non-governmental agencies have done a lot to mitigate this menace but it has become much more difficult to eradicate. Atmospheric pollution has affected the environment negatively in the area of recurrent health issues such as cancer, skin problem, eye, nose, etc. Pollution often arises from oil spill, industries, road construction, burning of solid waste, discharge of sewage into sea, effluent from vehicles, solid waste discharge from on-shore and offshore facilities, fishing vessels, gas flaring and many others. The situation is worse in the Niger Delta region of Nigeria where there are over 1000 gas flaring points which is the major sources of air pollution. Several studies have been conducted to assess the quality of air environment within Niger Delta region and result obtained has always shown very high level of toxic substances in the atmosphere (Maliszewska-Kordybach, Smreczak and Klimkowicz-Pawlas, 2013). All forms of pollution has been identified in the region including water, air, land, noise pollution from bush burning, plastic pollution, fishing vessels, dredging, eutrophication, oil and gas facilities, tank farm, chimney and hence, deform ecological balance with dire consequences on the resources of the region.

Gully erosion/coastal erosion

River banks are gradually washed by the influence of turbulent wave, tides and current which washes coastal resources away. Coastal erosion influence mangrove ecosystem, fishing settlement. The coastal part of Akwa Ibom State most especially Ibeno beach, Eastern Obolo, Oron and Ikot Abasi have seriously being eroded and subsequently leaving behind heaps of debris along channels and open spaces. Gully development and associated problems have reached a phenomenal crisis which pose negative threat to environmental quality and economic activities over the years in Akwa Ibom State specifically Iquita and Uya Oron. Gully development is one of the major threats to socio economic activity in Nigeria most especially in South Eastern States. Such an occurrence had constituted a serious ecological degradation in parts of South eastern Nigeria including Abia State, Anambra, Imo State, Akwa Ibom State among others as it leaves behind dug-out pits, craters and destablilized landscape (Abraham, Wilcox and Akpan, 2018). Socio-economic impact pose by gullies on these regions have significant effect on land use and has contributed to social tension which are not limited to scramble for cultivable land,

deforestation, land fragmentation, steep terrains, poor crop yield, hunger and poverty as well as resettlement of population.

Moreover, soil erosion had posed a negative impact on crop productivity and many farmers have receded their once fertile land in search for non-gully prone areas. Gully erosion has seriously affected agricultural productivity, farmland, buildings and settlement. This has rendered people homeless and reduced agricultural and economic development (Abraham, 2010, 2011, 2014a, 2014b). Today, many farmers in Southern Akwa Ibom State have move away from erosion impacted domain in search for productive lands to cultivate. Coupled with the scarcity of cultivable land, it has resulted in a serious competition for land and thus threatened agricultural intensification and development.

Method of Study

Study Area-Southern Akwa Ibom State

This study was carried out in Southern part of Akwa Ibom State with a view to unveiling the ecological problems prevalent in the region and its associated implications. Seven Local Government Areas including Mbo, Eastern Obolo, Urue Offong Oruko, Udung Uko, Ibeno, Ikot Abasi and Oron within the region were selected for the study. Two (2) villages in each local government were further sampled making a total of 14 villages. Southern Akwa Ibom State is predominantly a coastal area consisting of Ikot Abasi, Eastern Obolo, Mkpat Enin, Onna, Eket, Nsit Ubium, Ibeno, Esit Eket, Mbo, Urue Offong Oruko, Udung Uko, Oron and Okobo. Geographically, Southern Akwa Ibom State is bordered by Rivers State on the West, Oruk Anam, Etinan, Nsit Ibom, Nsit Atai, Ibesikpo, Nsit Atai and Uruan LGAs on the North, Cross River State on the East as well as Bight of Bonny (Atlantic Ocean) on the South. According to NPC (2006), the region has a population of 2281333 (as projected to 2019 on an annual growth rate of 3%) and a landmass of 2961.9km^2.

The entire region lies in the tropical rain forest belt and has two distinct season-rainy and dry season. The predominant vegetation in the region are but not limited to Nypa Palm, Oil Palm, Raffia Palm, ferns, shrubs, Rhizophora racemosa (red mangrove), white mangrove and variety of economic trees. Southern Akwa Ibom State has enormous natural resources such as clay, glass sand, palm produce and agricultural produce. Forest resources are abundant in the area such as reptiles, amphibians and wide variety of wildlife. Similarly, the region is also blessed with abundant cash crops and food crops . Cash crops ranges from oil palm, rubber, cocoa,

coconut and so on, whereas, food crops ranges from rice, cassava, maize, plantain, cocoyam, water yam, banana, okro as well as wild fruit such as Nyatet- Malsobotga dusenie, Mkpantuk-shnsepalum dwafian etc (Usoro & Akpan, 2010).

The climate condition of this area is largely controlled by its location along the coast of the Atlantic Ocean. The two prevalent air masses that blows over the area are the warm, humid tropical maritime and associated south-westerly trade winds (monsoon) which blows across the Atlantic Ocean. These winds usher in the wet season between April and October. The second is the cold, dry dusty tropical continental air masses with the associated harmattan winds which blow from the Sahara. It is called the North-East Trade winds and is experienced between December and February.

In terms of the geology of the region, two major geological formation are identified: the Younger Benin formation which covers the low-lying part of the state including Abak, Nsit Ibom , Nsit Atai, Nsit Ubium, Okobo, Ikot Abasi, Mkpat Enin, Essien Udim, Oruk Anam etc. Another formation is the beach ridge complex and alluvial deposits which occurs along the shores from Imo estuary, Kwa to Cross River estuary. This environment is characterized by a set of geomorphic features such as point bars, river channel, levees, back swamps among others (Akpabio, 2013). The people of Southern Akwa Ibom State are predominantly into fishing or fish selling although other livelihood are sourced from farming, trading and craft work. Besides, the region has abundant crude oil, natural gas, fine sand, laterite, sharp sand, water resources and many other essential resources. Due to the abundance of resources in the region, several companies have trooped in including Exxon Mobil, Septa Energy, fishing companies, sand dredging companies, petrochemical industries, agro-allied industries and other cottage industries.

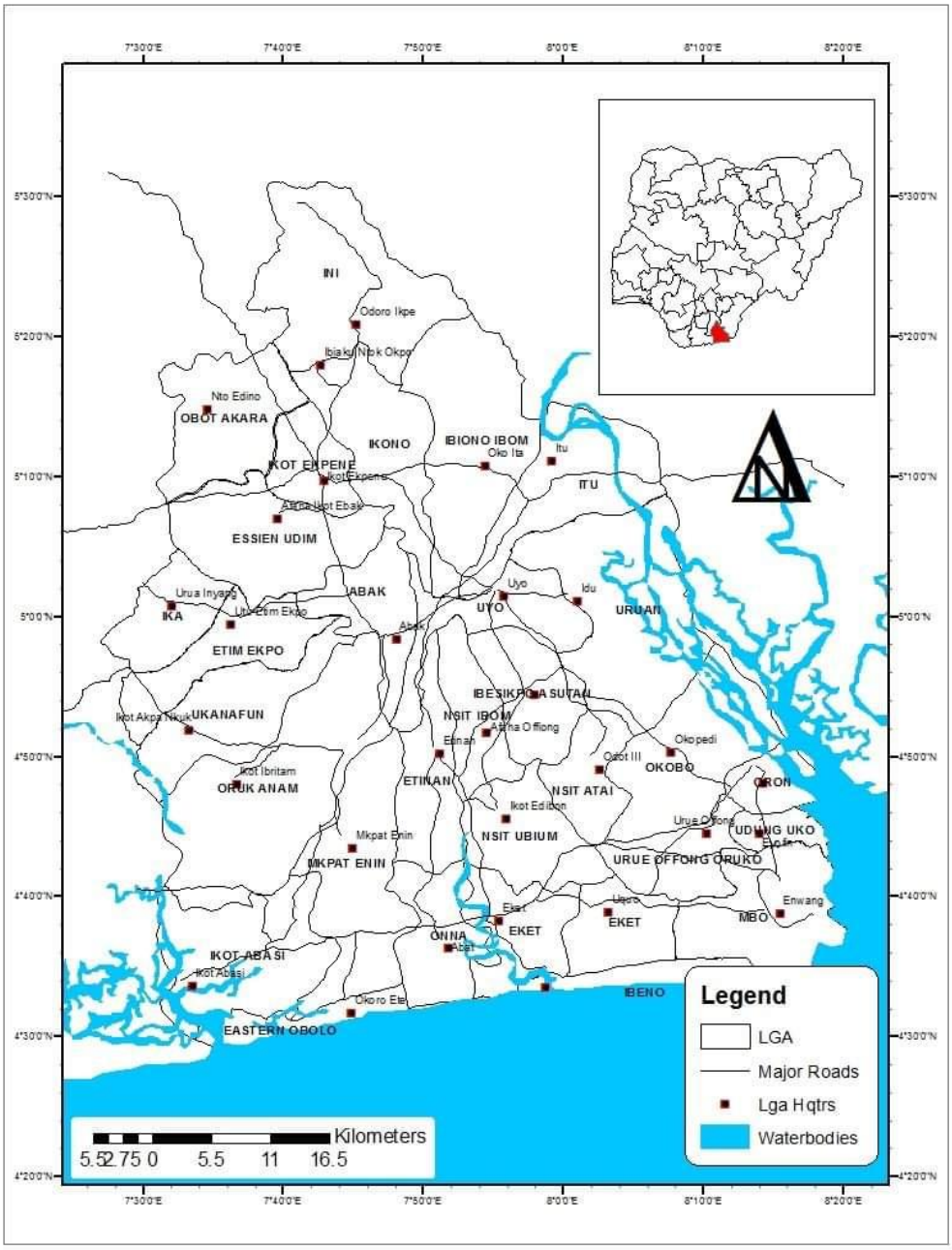

Fig 1: Map of Akwa Ibom State

Source: Survey Division, Akwa Ibom State

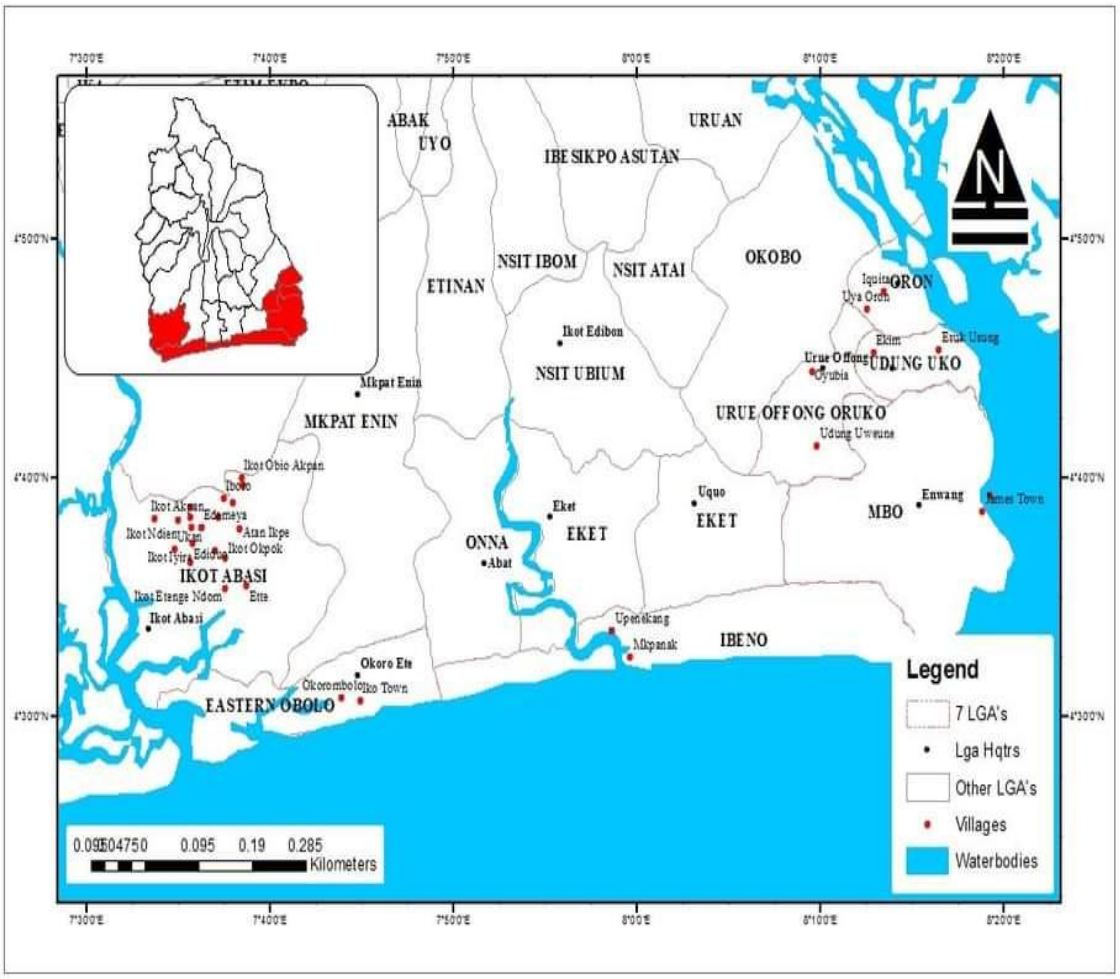

Fig 2: Map of Southern Akwa Ibom State Showing the sampled Local Government Area

Source: Survey Division, Akwa Ibom State

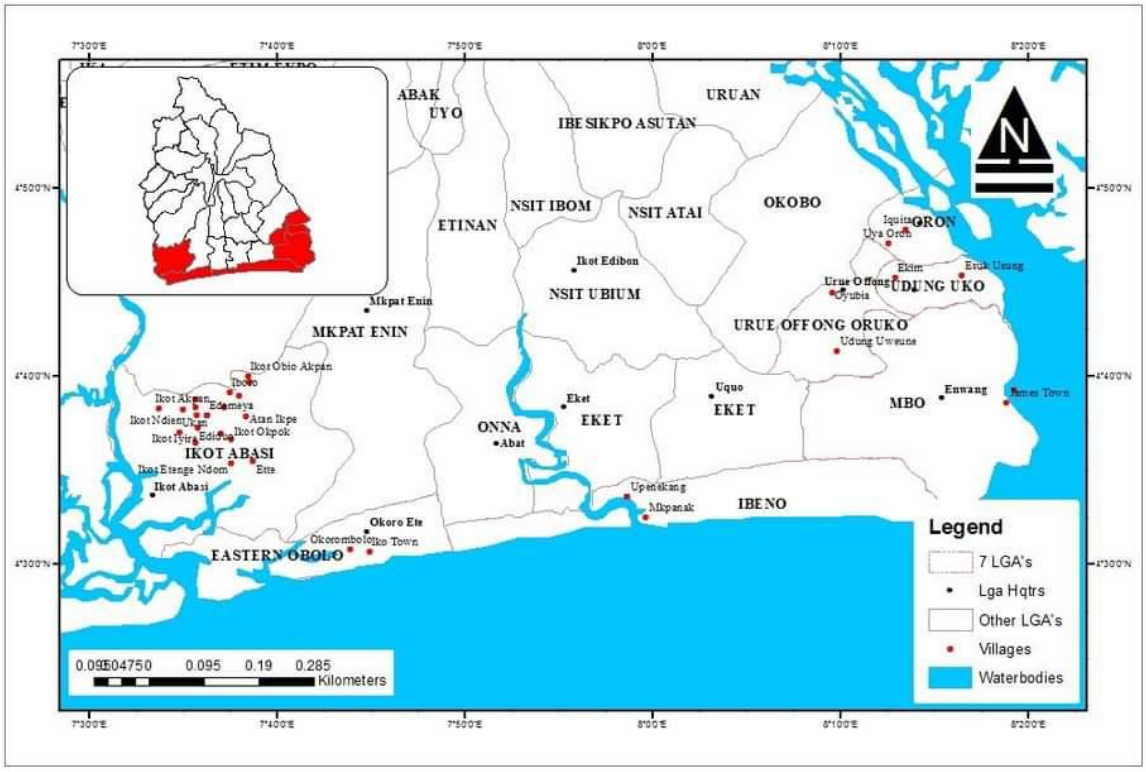

Fig 3: Map of Southern Akwa Ibom State showing the sampled communities

Source: Survey Division, Akwa Ibom State

Methods

The study centred on Southern Akwa Ibom State with seven (7) Local Government Areas randomly selected out of eleven (11) Local Government Areas in the region. Reconnaissance survey was done prior to field work between September 2019 and April 2020. Focus Group Discussion enables stakeholders and locals to air their views on problems ravaging their ecological domain. The study employed both descriptive and quantitative method of data analysis. 28 structured questionnaires were distributed to heads of household in fourteen (14) selected communities making a total of 392 questionnaires. Multiple Regression using SPSS package was used to ascertain the effect of ecological problems in Southern part of Akwa Ibom State, Nigeria.

Results and Discussions

Table 1: Socio-economic Characteristics of Respondents

Characteristics	**Frequency**	**Percentage**
Gender		
Male	180	45.9
Female	212	44.1
	(n-392)	(n-100)
Marital Status		
Single	102	26
Married	171	43.6
Divorced	35	8.9
Widow	84	21.4
	(n-392)	(n-100)
Educational qualification		
Non formal	50	12.8
Primary	80	20.4
Secondary	180	45.9
Tertiary	82	20.9
	(n-392)	(n-100)
Occupation		
Civil servant	76	19.4
Farming	95	24.2
Trading	40	10.2
Fishing	58	14.8
Artisan	23	5.9
Unemployed	100	25.5
	(n-392)	(n-100)
Family size		
1-5 persons	122	31.1
6-1 persons	197	50.3

10 and above	73 (n-392)	18.6 (n-100)

Authors' Fieldwork, 2020

Table 1 showing the demographic and socio-economic status of respondents revealed the various parameters characterizing Southern Akwa Ibom State. The study indicated that people who had a family size between 6-11 were 50.3%, followed by people between 1-5 persons with 31.1% and 18.6% for the family size of respondents falling above 10 persons. Farming as an occupation had 24.2% while 45.9% had secondary education.

Table 2: Study Area with Coordinates

Villages	**Longitude**	**Latitude**
Mkpanak	$4^0$34'4.58''N	7^0 62'7.23''E
Upenekang	$4^0$51'7.31''N	7^0 39'5.07''E
Esuk Usung	$4^0$46'4.95''N	8^0 14'7.23''E
Ekim	$4^0$51'5.78''N	8^0 16'8.55''E
Iko Town	4°20' 4.35N	7°40'7.49' E
Okorombokho	4°26' 7.01N	7°42'8.23' E
Iquita	$5^0$16'5.27N	$7^0$36'7.60'' E
Uya Oron	$5^0$19'8.42N	$7^0$36'5.84'' E
Udung Uwe-une	$4^0$43'4.65''N	8^0 14'8.96E
Oyubia	$4^0$51'5.22''N	8^0 15'9.06E
Ette	4^0 28'4·43' N	7^0 30'5.06'E
Edemeya	4^0 33'6·61' N	7^0 60'2.39'E
Esuk Enwang	4^0 38'3.53''N	8^0 14'8.27E
James Town	4^0 36'4.53''N	8^0 16'8.30E

Authors' Fieldwork, 2020

The coordinate of sample communities in Southern Akwa Ibom State enabled the Geographic manipulation of maps attached in the Study area.

Table 3: Common Ecological Problems in the Study Area

Villages	Local Government Area	Ecological Problems
Mkpanak	Ibeno	Oil spill, gas flaring, coastal erosion, deforestation, pollution, mangrove disturbance, vandalisation of oil pipelines, oil bunker
Upenekang	Ibeno	Oil spill, gas flaring, coastal erosion, deforestation, pollution, mangrove disturbance, kidnapping, disturbance of oil and gas operation
Esuk Usung	Udung Uko	Water pollution, coastal erosion, open defecation, contamination/death of aquatic life
Ekim	Udung Uko	Land degradation, deforestation, open defecation, eutrophication
Iko Town	Eastern Obolo	Oil spill, coastal erosion, deforestation, open defecation, pollution, soil infertility
Okorombokho	Eastern Obolo	Oil spill, gas flaring, coastal erosion, deforestation, pollution, open defecation
Iquita	Oron	Gully erosion, Water pollution, deforestation, death of marine life
Uya Oron	Oron	Deforestation, sand dredging, fishing with chemicals
Udung Uwe-une	Urue Offong Oruko	Water pollution, deforestation, sand mining
Oyubia	Urue Offong Oruko	Open defecation, Deforestation, water

		pollution, sand mining
Ette	Ikot Abasi	Pollution, deforestation, open defecation, sand dredging, open defecation
Edemeya	Ikot Abasi	Deforestation, water pollution, open defecation, sand mining, agro-chemical pollution
Esuk Enwang	Mbo	Pollution, deforestation, contamination/death of aquatic life
James Town	Mbo	Coastal erosion, mangrove disturbance, Pollution, deforestation, sand dredging, fishing with chemicals

Authors' Fieldwork, 2020

Table 3 analyzed the various ecological problems experienced in individual communities understudy. These included but not limited to deforestation, water pollution, open defecation, sand mining, agro-chemical pollution, coastal erosion, mangrove disturbance, fishing with chemicals, oil spill, gas flaring, vandalisation of oil pipelines and oil bunker.

Table 4: Areas of community efforts in management of ecological problems

Villages	**Community Intervention**
Mkpanak	Planting of trees, sensitization, protest, livelihood changes, Request for Environmental Impact Assessment
Upenekang	Land Conservation, strengthening community participation in resource conservation, monitoring/ sanctions, Protest
Esuk Usung	Mobilization of community partisans, management of fishing, Planting of trees, Sand bag and Groin
Ekim	Crop management, soil conservation, tree planting
Iko Town	Tree planting, mounting of protest, community awareness
Okorombokho	Sensitization, collaboration with government
Iquita	Tree planting, soil management, coastal management

Uya Oron	Tree planting, soil management, community participation
Udung Uwe-une	Protection of river banks, sensitization
Oyubia	Tree planting, forest conservation
Ette	Awareness, coastal management, Afforestation
Edemeya	Sensitization, partnership with government/NGOs, training/empowerment of farmers
Esuk Enwang	Awareness, empowerment of fishermen, building/donation of fishing boat by community philanthropist
James Town	Tree planting, corporate social responsibility, sensitization

Authors' Fieldwork, 2020

Table 4 shows the community efforts in management of ecological problems. Some of the noticeable strategies included planting of trees, sensitization, protest, livelihood changes, corporate social responsibility by multinationals, awareness, empowerment of fishermen and other artisans, building/donation of fishing boat by community philanthropist.

Table 5: Challenges facing management of ecological problem

Villages	**Community responses**
Mkpanak	Inadequate fund, poor attitude to communal activities, unemployment, land and air pollution, water contamination
Upenekang	Low interest, mismanagement of funds
Esuk Usung	Misplaced priority, poor status of community dwellers
Ekim	High illiteracy, low knowledge on soil management
Iko Town	Diversion of funds by community elites, low interest, unemployment, poverty
Okorombokho	Poor attitude/slow response on ecological issues, poverty, land pollution, water and air contaminant

Iquita	slow response on ecological issues, poverty, low capacity of community on handling ecological funds, corruption
Uya Oron	Poor community leadership, low interest, unemployment, poverty, overdependence on resources
Udung Uwe-une	Inadequate fund, illiteracy
Oyubia	Low government support, inadequate funding
Ette	Poor community leadership, Low government support, laxity on project monitoring
Edemeya	Low government support, self-centred interest
Esuk Enwang	Poor government support, poverty, infrastructural failure, poor empowerment initiatives
James Town	Inadequate fund, illiteracy, self-centred interest, no government assistance

Authors' Fieldwork, 2020

Table 5 shows the challenges facing management of ecological problem. These included inadequate fund, poor attitude to communal activities, unemployment, land pollution, self-centred interest, infrastructural failure, policy inconsistency and corruption.

Table 6: Community Response on ecological problems

Villages	**Community responses**
Mkpanak	Request for Improved fund, afforestation, compensation, cleaning of oil spilled areas, job creation
Upenekang	Request for Improved community participation, cleaning of oil spilled areas, reduce gas flaring

Esuk Usung	Request for Adequate funding, improved community development and empowerment
Ekim	Afforestation, improved soil management, empowerment of community dwellers and job creation
Iko Town	cleaning of oil spilled areas, reduce gas flaring, compensation
Okorombokho	Request for Community development, cleaning of oil spilled areas, job creation and youth empowerment
Iquita	Effective soil conservation, job creation
Uya Oron	Request for effective community leadership, adequate funding and soil conservation
Udung Uwe-une	Sensitization, funding, water/soil management
Oyubia	Afforestation, government support, job creation and poverty alleviation
Ette	Effective community leadership, afforestation
Edemeya	Improved government support on farming and artisans, afforestation, soil conservation
Esuk Enwang	Environmental management, empowerment, timely disaster management
James Town	Request for adequate funding, compensation, sensitization, stakeholders collaboration and soil conservation

Authors' Fieldwork, 2020

Table 6 shows some measures to control ecological problems in the study area which was not limited to adequate funding, compensation, sensitization, stakeholder's collaboration, improved community participation, cleaning of oil spilled areas, reducing of gas flaring and timely disaster responses.

Table 7: Government Intervention in ecological problems in Southern Akwa Ibom State

Villages	Government Intervention
Mkpanak	Cleaning of oil spilled areas, job creation, Stubb Creek conservation and reduce gas flaring
Upenekang	Infrastructural development, cleaning of oil spilled areas, reduce gas flaring
Esuk Usung	Adequate funding, improved community development
Ekim	Afforestation, improved soil management, empowerment of community dwellers
Iko Town	cleaning of oil spilled areas, reduce gas flaring, compensation, provision of fishing gear
Okorombokho	Social amenities, cleaning of oil spilled areas, job creation
Iquita	Effective soil conservation, job creation
Uya Oron	Rural development, adequate funding of project, soil conservation
Udung Uwe-une	Sensitization, funding, water/soil management
Oyubia	Afforestation, government support, job creation, youth empowerment
Ette	Youth empowerment, afforestation, soil conservation
Edemeya	Improved government support on farming and artisans, afforestation, soil conservation
Esuk Enwang	Environmental management, empowerment, timely disaster management, land acquisition for farming
James Town	Adequate funding, compensation, sensitization, stakeholders collaboration, empowerment

Authors' Fieldwork, 2020

Table 7 shows government responses on control of ecological problems in the study area which was not limited to youth empowerment, adequate funding, compensation, sensitization, stakeholder's collaboration, improved rural development, cleaning of oil spilled areas, reducing of gas flaring and timely disaster responses.

Table 8: Ecological Degradation and Livelihood Adjustment

Villages	**Livelihood Adjustment**
Mkpanak	Trading, welding, seeking employment in civil service
Upenekang	Planting, food vending, car washing, trading, carpentry, fuel wood, marketing and fishing
Esuk Usung	Car washing, barbing saloon, hairdressing saloon, boat making, sand mining
Ekim	Farming, trading, mat weaving, fruit collection
Iko Town	Bush meat, merchant, fishing, moulding, oil milling, farming, trading, palm wine tapping
Okorombokho	Fishing, trading, mining, carpentry, food vending, farming, welding
Iquita	Sand mining, fishing, trading, welding, hair dressing
Uya Oron	Sand mining, fishing, trading, carpentry, welding, farming
Udung Uwe-nne	Fishing, trading on sea food and food crops
Oyubia	Trading, fishing and boat making
Ette	Boat making, fishing, lumbering, fuel wood marketing, trading, welding
Edemeya	Fishing, trading, lumbering, boat making
Esuk Enwang	Boat making, fishing, trading, lumbering
James Town	Sand mining, fishing, trading, lumbering, boating, sea food marketing, washing

Authors' Fieldwork, 2020

Table 8 shows ecological degradation and livelihood adjustment in the study area which include boat making, fishing, lumbering, fuel wood marketing, trading, welding, mat weaving, fruit collection, fuel wood marketing, food vending, car washing, carpentry, farming, oil milling, sea food marketing, hair dressing, palm wine tapping.

Statistical Results

Correlations

		Farmland affected	Deforestation	Oil spillage
	Farmland affected	1.000	.828	.807
Pearson Correlation	Deforestation	.828	1.000	.988
	Oil spillage	.807	.988	1.000
	Farmland affected	.	.002	.002
Sig. (1-tailed)	Deforestation	.002	.	.000
	Oil spillage	.002	.000	.
	Farmland affected	10	10	10
N	Deforestation	10	10	10
	Oil spill	10	10	10

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.831[a]	.690	.602	.59486	.690	7.8804	2	7	.017

a. Predators: (Constant), Land degradation, Oil spill

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	5.523	2	2.762	7.804	.017[b]

1	Residual	2.477	7	.354		
	Total	8.000	9			

a. Dependent Variable: Farmland affected

b. Predictors: (Constant), deforestation, oil spill

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.962	.616		1.563	.162	-.493	2.418
	Deforestation	.397	.422	1.260	.913	.377	-.599	1.394
	Oil spillage	-.113	.345	-.438	-.327	.753	-.929	.703

a. Dependent Variable: Farmland affected

Discussion of Findings

The study examined the ecological degradation in Southern Akwa Ibom State with a view to proffer useful measures on management of the fragile environment. The Southern part of Akwa Ibom State has been so much disturbed by both natural and anthropogenic invasion following an irresistible search for mineral and non-mineral resources, oil and gas, fisheries, forest resources and sand aggregate. Much attention has been drawn to this area following her abundance potential all in a bid to explore and exploit the resources but the issue remains that as these resources are harnessed, little or no efforts have been channeled into sustainable management of the ecosystem in question and this results to the emergence of wide range of ecological problems such as oil spill, forest destruction, gas flaring, water pollution, air pollution, oil bunkery, ground water contamination, soil acidity, poor crop yield which affect agricultural production and all manners of socio-economic challenges including poverty, unemployment and criminal activities. Apart from anthropogenic-induced ecological disturbance, there are also naturally-occurring ecological problems which the study had identifies to be not limited to gully

erosion, coastal flooding, landslide and many others. The study employed multiple regression to examine the effect of ecological problems (gully erosion and oil spillage) on agricultural production in the study area given the rise in food insecurity in the region. The study revealed that, the high level of degradation has impacted upon agricultural production, even as 24 hectares of farmland are seriously affected by either oil spill or deforestation. Starting from the correlation matrix, the correlation between farmland affected by deforestation and oil spillage was strong (0.828) and significant at (0.002). In the same vein, the correlation between farmland affected and oil spillage was strong (0.807) and also significant at (0.002). All in all, in the model summary, the significant value was 0.017 which implies that Ho is rejected and can therefore be concluded that there is significant effect of ecological degradation in the study area. The R value of (0.831) implies that both oil spillage and deforestation has 83% effect on the environment. Nevertheless, actions need to be taken because more oil and gas deposit are discovered and exploited with little management option and more so, other naturally-induced disaster such as gully erosion and coastal flooding are becoming more severe due to changes in land use. This corroborates with finding from Ebierikpe (2016) that oil and gas operation negatively affect the ecology of Southern Akwa Ibom State, Nigeria.

Conclusion

The activities of human have to a greater extent influenced the productivity as well as the environmental stability in the Southern part of Akwa Ibom State. The implications are made manifest in the form of economic lost, environmental degradation and livelihood deprivation. From the stand point of environmental cost, excessive and unsustainable exploitation of the resources in the region has led to oil spillage which hampers the productivity of aquatic life, contaminate water sources and deplete biodiversity. Such negativities contribute to poverty and livelihood adjustment in the affected communities. Non-formal sector like fishing, hunting, farming and wine production are equally influenced even as many people in the afore-mentioned sectors would be forced out into other sources of livelihood. Without putting up a clear cut institutional and management plan for the region, there is bound to be a drastic ecological change and its attendant implications would be very inimical and counter-productive to development. Currently, all attention has been shifted to this region due to its abundant resources like crude oil, fertile soil, forest and agricultural resources, fishes and other aquatic life. Albeit, no effort has been made to re-align sound policy that would arrest the recurrent

environmental challenges which is very critical in the region. For instance, places like Ikot Abasi, Oron, Mbo, Okobo, Eket, Eastern Obolo and Ibeno LGAs are facing the scourge of environmental damage resulting to contamination of water sources, dead of fishes on the open sea, pollution of estuaries and other wetlands, gas flaring, oil spillage and accelerated deforestation. In Ikot Abasi, the local people have moved into over-depletion of non-timber, lumbering and other issues. Other parts of Southern Akwa Ibom State are struggling with other forms of degradation which needs urgent attention by the stakeholders.

Recommendations and necessary action

From the result of the findings from this study, the following recommendations are stated;

- There is need to design and implement development plan for the region with local stakeholder's inclusive. This statutory plan should include protection of community livelihood, compensation in cases of hazard occurrences.
- Establishing a cohesive mutual understanding between the various stakeholders in natural resources management
- Enforcing laws and orders with strict sanctions to perpetrators including multinational companies and other beneficiaries of resources in the region
- Promote research on natural resources management and environmental management. This research should involve a wide range of areas including fisheries, ecological protection in the petroleum sector, forestry, water resources in the context of long term plan, medium and short term planning.
- There is need for periodic ecological assessment of oil companies in the region
- Adequate compensation should be given to the host communities
- There is an urgent need for ecological restoration of degraded environment through cleaning of oil spilled-areas and more trees should be planted to reduce air pollution and other environmental issues

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