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THE VALUE OF MANGROVE FOREST RESOURCES IN COOKEYS CREEK OPOBO TOWN

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ABSTRACT

The destruction of mangrove vegetation in Opobo town due to land reclamation projects were undertaken to increase the amount of developable land in Opobo town was done without the determination of the value of the mangrove ecosystems that would be lost. This study attempts to determine the value of mangrove forest resources lost due to the land reclamation through questionnaire, focus group discussions, site (study area) visitation, other related materials and face to face interviews, the statistical analysis indicate that, If no quantifiable measure of the value of mangrove forest and its resources in monetary terms are made available, then it could be perceived that mangrove forest have little or no value to society and can therefore, be exploited. There is an urgent need for the mangrove forest and its resources and other coastal ecosystems services to be valued in monetary terms. It is an accepted fact that mangrove forest and its resources are threatened, therefore, to inform decisionmakers, it is necessary to have a base value for mangrove forest in Nigeria using the Cookey's Creek mangrove forest as a study site.

KEYWORDS: *Mangrove Forest, Reclamation, Resource Dependency, Livelihood, and Value*

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INTRODUCTION

Mangrove is a typical evergreen tree of tidal coasts, assemblage of trees and shrubs that develop between tidal zone in saline coastal region (Omokhua and Ofodile, 2011).Mangroves are broadly classified into two groups, they are;

(1)True mangroves and (2) Mangrove associates.

True mangrove species only grow in intertidal zones, e.g., Heritierafomes, Bruguieragymnorrhiza, Avicennia alba, and Rhizophoramucronata, whereas mangrove associates can survive in both littoral and terrestrial environments, for example; Hibicustilisaceus, Suaedanudiflora and Thespesiapopulnea.

Mangrove forests are extremely important coastal resources, which are vital to our socio-economic development. A vast majority of the human population lives in coastal areas, and most communities like Opobo community depend on local resources for their livelihood. The mangroves are sources of highly valued commercial products and fishery resources and also as sites for developing a burgeoning or expanding eco-tourism (Kathiresan and Bingham, 2001). The mangrove forests have been shown to sustain more than 70 direct human activities, ranging from fuel-wood collection to fisheries (Dixon, 1989; Lucy, 2006).

Mangroves contribute significantly to the biodiversity of the ecosystem. They serve as a feeding area for birds, especially migratory birds. Roots of the mangrove slow down water flow and in that process work against erosion. The presence of mangroves is beneficial to aquatic life that resides nearby.

Mangroves are one of the most threatened ecosystems worldwide located within the intertidal zones of tropics and subtropics. They provide both ecologic and economic benefits to coastal communities. Dreadful conditions of mangrove ecosystems in Opboo town are mainly due to a continuous increase in anthropogenic activities such as conversion of mangrove wetlands for reclamation of land. In the coastal areas inhabitants are at risks of losing their livelihood and ecological communities are on the verge of extinction. Mangroves, a type of salt-tolerant tree, grow in shallow salt or brackish waters in creeks and along the coast of Opobo town.

LITERATURE REVIEW

Nigeria has the largest mangrove forest in Africa and the fifth largest in the world (Spalding M, Kainuma M, Collins L (2010). The African mangrove covers 10 percent of the wooded forest area of Nigeria (Ekeke and Ariwaodo, 2000). Mangrove forest is characterized by swampy ground separated by narrow brackish lagoons and connected creeks and on the banks of these creeks typical mangrove forest is developed under the low energy of tidal flooding (Ekeke and Ariwaodo). Mangrove (wetlands) in Opobo town is threatened because, unlike other areas of the world, they are not protected by law. One of the biggest threats to the mangrove forest is the demand for land for development (land reclamation). As more development occurs, the wetlands are cleared away to make room. Mangrove wetlands in Opobo town serve important economic roles. They not only help prevent the destruction of coastlines, but they also enhance the lively hood of the Opobo people.

Mangrove Ecosystems provide important protective values like property, infrastructure, lives, and productive economic activities on coastlines from wave and storm energy (Chong, 2005). The shoreline protective services of mangrove ecosystems are very valuable during extreme weather events, such as hurricanes and tropical storms. Profound Ecological benefits are reportedly derived from mangrove forests such as nursery grounds for numerous fish, shellfish, oyster colonies, prevents the soil from being washed away, coastal stabilization, filtration of land runoff and flood control (De la Cruz, 1979). The mangrove forests also provide habitat for birds, other vertebrates and invertebrates (Paw and Chua, 1991; Kimani et al 1996).

Economically, the mangrove ecosystem serves as a source of important products to Nigeria's coastal communities in the form of poles and timber as building material for boats and houses, firewood, salt, tannins, dyes, charcoal, biodiversity, it gives cultural services like recreation, aesthetic, food as well as medicinal herbs etc. (Macnae, 1968; Walsh 1994). Mangrove forests have economic value when they are conserved or utilized sustainably.

The Nigerian Oil industries are located mostly in the mangroves forests. The activities of the numerous oil exploration companies have led to fragmentation, deforestation of the mangroves forest ecosystems (Abere and Ekeke 2011). Other challenges responsible for the degradation of the mangrove forest include land reclamation for the building of settlements, fishing, electricity, logging, refuse dump, sand extraction, pollution from agro and other chemical industries, urbanization. etc (Chima and Larinde, 2016).

In Nigeria, 21,342 hectares of mangrove vegetation was reported to have been lost between 1986 and 2003 due to urbanization, dredging activities, and pollution from oil and gas industries (Ezeanyagu*et al.*, 2016). Oil spills, especially

large-scale ones, have potentially devastating effects on mangroves, the flora and fauna sheltered by them and the ecological services they provide. Accordingly, mangroves are ranked among the most sensitive of shoreline regions in the environmental sensitivity index (ESI) of the National and Oceanic Atmospheric Administration (NOAA), which measures how sensitive an area of shoreline would be to an oil spill (Bann, 1997). Destruction of fishing grounds and forest dieback are just but a few of such problem.

Therefore, there is an urgent need for the mangrove forest and its resources and other coastal ecosystems services to be valued in monetary terms in order for adequate compensations to be paid when the mangrove forest is cleared for any reason.

The Study Site

The study site is Cookey's Creek in Opobo town. Opobo Town is a community in Opobo/Nkoro Local Government Area (LGA) in Rivers State, Nigeria. Opobo Town comprises of 67 war canoe house which is headed by a king called Amayanagbo in their mother tongue, each of these war canoe houses is referred to as (Polo) compound which is headed by a chief (Alabo), each of these compound (polo) is made up of various families (gburusu) headed by an elder called Warisenibo in their local language, and each of the family units is also headed by an elder called Senibo. Opobo town has satellite villages that are spread within the coastal areas sharing boundaries with IkotAbassi L.G.A. Akwa Ibom State and other communities in River State like Nkoro community and Andoni L.G.A.

Opobo town speaks Igbani language as their real mother tongue because they migrated from the Grand Bonny and Igbo language as a borrowed language adopted from the Igbo's during the slave trade. Their major traditional occupation is fishing, hunting, traditional herbal treatment, and farming because of their geographical location (Coastal region), they are also very educated because of the early collaboration with the white men while at Bonny. Opobo town is situated about 80km south of Port Harcourt and 45km from Onne Industrial area (UNEP 2011). One of the satellite villages called 'Abazibie' in Opobo town is very close to the Atlantic Ocean and the town is surrounded by Rivers, Creeks, and Lakes with mangrove forest.

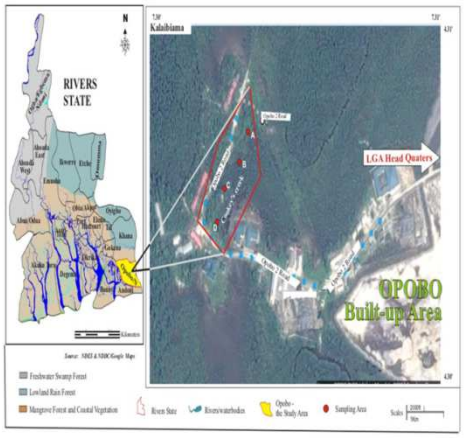

Figure 1: Map of Rivers State Showing the Study Site

MATERIALS AND METHODS

To accomplish the purpose of this research work, the methodology adopted started with the collection of data(primary and secondary data), the data collected will be well analyzed.

The study site was visited on **Friday 23rd June 2017,** during the site visitation, a questionnaire survey, was used for a face to face interview, focus group discussions (FGDs) and direct observation was used for collection of data. Several discussions were held during the site visitation to actualize the purpose of the visitation. The report incorporates the inputs provided by the users and non-users of the mangrove forest. The focus group discussions took place at the study area Opobo town, which started at **3:30pm** and ended at **6:45pm** on **Saturday 24th June 2017.** The FGDs comprises the mangrove forest users, community dwellers, and the researcher. Focus Group Discussions (FGDs) was used in this work in order to ascertain relevant, valid, reliable and credible information and eliminate irrelevant information gotten from other sources of data collection.

Findings

The findings show that five (5) different types of mangroves exist in the study site which includes, red, black, white, orange and river mangroves, namely;

River Mangrove *(Aegicerascomiculatum) (Native Name: Ockor)*

This mangrove tree is a small shrub. It grows around tidal zones and sometimes on soil if it is the right type. Unlike most mangrove trees, this mangrove has a rather low salt tolerance which is why it would usually grow around the freshwater. It drops its seeds profusely between the months of January and March every year.

Red Mangrove *(Rhizophora Mangle) (Native Name: Etegbe)*

Red mangroves grow in brackish areas along shorelines or in shallow water and are the most salt tolerant species of mangrove. They can easily be distinguished by their high prop roots which support the tree, supply air to the underlying roots and help stabilize the substrate. The red mangrove's high prop roots also provide hiding spots for juvenile fish, providing a labyrinth for them to hunt and seek shelter. Because red mangroves have an especially high salt tolerance, they are often found closer to the water than the other mangroves in the community. Red mangroves are unique in their reproductive habits.

Black Mangrove *(Avicenniagerminans) (Native Name: Forodangana)*

Black mangrove is easily identified by its roots which are specialized to take in oxygen. Roots look like tubular bristles which stick out vertically and trap oxygen for its oxygen-starved root systems. These bristles are known as pneumatophores. The Black Mangrove is tolerant of high saline conditions and the trees grow in isolated groups or woodland formations. Individual trees are fairly large and may grow up to 20-25 meters in height and 40 centimeters in diameter at breast height

White Mangrove (*Lagunculariaracemosa*) *(Native Name: Akwua)*

These are the shortest of the three species (reaches 5.6 meters and a diameter of 30 centimeters) and have un-buttressed roots. This species normally grows in the back portion of mangrove swamps, which remains unaffected by tidal inundation, except during spring tides. The bark is light brown to reddish dark brown, and the leaves are ovate.

Orange Mangrove *(Bruguriagymnorhiza) (Native Name: Ngala)*

This type of mangrove can grow up to 8 to 12mts in height. The trees roots are described to be rope-like and thick. The roots are visible as they stick out from the ground. These trees reproduce like any other mangrove, growing a long

stick - like seed until it drops to the ground, the tip of the seed either spearing itself into the ground below or being carried away by the water until it plants itself. The Orange Mangrove leaves can grow to 9 - 12cms in length and 3.5 4.5cms broad.

The Uses of Mangrove Forest and Its Resources

The findings also show that the uses of mangroves fall into two (2) categories, firstly the use of the mangrove ecosystem as a whole or its conversion to other uses, and secondly, the use of products (mangrove forest resources) from the mangrove ecosystem.

Ecologically mangroves are important in maintaining and building the soil, as a reservoir in the tertiary assimilation of waste, and in the global cycle of carbon dioxide, nitrogen, and sulfur. The protection against cyclones is a "free" benefit. Yet hidden benefits from mangroves, especially in marginal areas, may even be more important than the obvious ones. They play a significant role in coastal stabilization and promoting land accretion, fixation of mud banks, dissipation of winds, tidal and wave energy. The uses of mangrove forest and its resources include;

- Mangrove forest play a significant role in coastal stabilization and promoting land accretion, fixation of mud banks, dissipation of winds, tidal and wave energy.
- Timber production for construction
- Traditionally, people have used mangroves for the benefit of the local community, but increasing populations have led to an increasing non-sustainable abuse of the resources
- Mangroves are used in flavoring agents, textiles, mats, paper, housing, baskets, boats, and tapa cloth and also used as staple food.
- Mangrove plants are valuable sources of dyes. The exploitation and value of aquatic products from mangrove ecosystems is of great significance today.
- Fisheries. Mangrove forests are home to a large variety of fish, crab, shrimp, and mollusk species
- Accommodation for marine lives (fish and birds)
- A relatively recent commercial use of mangroves is for recreation and ecotourism
- Like coral reefs, mangrove forests are extremely productive ecosystems that provide numerous good and services both to the marine environment and people.
- Plant products (mangrove forest resources)
- Tourism
- Coastline Protection and Stabilization
- Carbon Demanding (respiration between plants, human beings, and animals)

The Loss of Mangroves

The findings in this section are showing the results of the lost value of mangrove and its resources due to land reclamation which is presented according to the users of mangrove forest.

For the purpose of clarity, it is important to define value before analyzing the value.

The word "VALUE" means different things to different people and the real meaning can only be gotten from the context within which it is used for.

So value is a measure of a relationship between supply and demand. Based on this premise; when a valuer uses the word "VALUE" he is referring to Market Value which can be defined as the amount of money which can be obtained for the interest at a particular time from persons able and willing to purchase it.

The lost value of mangrove forest resources is ascertained from the mangrove forest users who are solely depended on the mangrove forest and its resources for their livelihood and the amount of money each of the mangrove forest users made per month which will be multiplied by 12 to get the annual value of the mangrove forest, using the Cookey's Creek mangrove forest as a study site.

The Value of Mangrove Forest Resources

The mangroves forest users include; the Hunters, the Farmers, the Fishermen/women, the Herbalists, and the Community dwellers.

The notable objectives of the focus group discussions were to ascertain the usefulness, different kinds of benefits obtained from mangroves forest and its resources, different kinds of mangrove goods extracted by its local users and the farm gate prices of the various mangrove resources. The FGDs provided clarity on a number of issues, which in turn provide the needed information on how valid and credible the information ascertained from the forest users were.

Below are the tables showing the results of the value of the various mangrove forest resources using the farm gate price

From the information gathered during focus group discussions and face to face interviews, the hunters said, "hunting job is like a game, some weeks your trap will not catch anything for you, or you will not even see any animal to shoot, but some days and weeks you will be tired of shooting animals.

Because of their number walking in a group and your trap will even catch the animals on daily basis. But the monkey is the only animal that is always available in the mangrove forest but very hard to catch in a trap, they always catch monkey either by mixing grinded tobacco (snuff) and illicit gin or by shooting".

Table 1 shows the types of resources usually gathered from mangrove forest, the native names and estimated farm gate prices.

Table 1

S/N	Name of Animal		Farm – Gate Prices Per Month(₦)
	Native	English	
A	Gidi	Alligator Lizard	24, 000.00
B	Nkinta mini	Wolf	14, 000.00
C	Ele	Antelope	19, 000.00
D	Eduura	Bear	11, 000.00
E	Enwe	Monkey	90, 000.00
F	Aguo, Eke	Snake, Python	65, 000.00
G		King fisher	2,500.00
H	Odum ne gbuagu	Lion, curb	120,000.00
I	Mbe	Tortoise	7,000.00
J	Osa	Squirrel	5,500.00

Table 1			
K	Ishibri	Monitor Lizard	36, 000.00
L	Anunnu	Push pig	22, 000.00
M		Grass cutter	16, 000.00
N	Iguohia	Idiot	44, 000.00
O	Ebinsh	Porcupine	14, 000.00
P	Punu	Bush cat	8, 000.00
Q	Oshi	Snail	4, 000.00
R	Egbe	Kite	1,500.00
S	Oganku	Hulk	2, 000.00
T		Rabbit	4, 000.00
U	Nku	Firewood	6, 000.00
V	Oshishiukuulo	Poles	5, 000.00
		Total Monthly Value	**₦440,000.00 X 12**
		Annual Total Value	**₦5,280,000.00**

Source: Field Survey 2017

During the focus group discussions, and in face to face interview, a herbalist told me that, "they are supposed to be very wealthy, and that if you are not sympathetic as a traditional herbalist you will not only be hated by the people but you will be regarded as a very wicked person. The reason has been that, in the rural setting, the majority of the rural dwellers are not financially stable and they do not go for a medical checkup, it is only when the ailment is out of hand, they will come for treatment and with one phrase' please help, I do not have money'. So the only option left for them as an herbalist is to treat them with the little money they have". He then gave an estimate of his income from the various herbs as shown in Table 2

Table 2

S/N	Name of Leaf			Farm – Gate Price (₦)	
	Native	English	Uses	Weekly	Monthly
1	Akukwoobodobo	Cocoyam leaf	To cure infections		12, 000.00
2	Abosi root	Hospital too far	For blood	3,000.00	15, 000.00
3	Amara manuabali	Hibiscus flower	To cure ringworm		
4	Ogiriilu	Bush bitter leaf	To cure typhoid and for abortion	2, 500.00	
5	Eritang		For stomach ache	1,500.00	
6	Aka agu	Lion grass	For mystics and to get rid of snake		5, 000.00
7	Dawa or Joro	Monkey no climb	For waste pain and sexual fitness	3, 500.00	
8	Mkpuruuwanjonjo	Nipa palm seed	For cholera and spiritual attack		25, 000.00
9	Ikani	Scent leaf	Stomach ache, dysentery and skin bleeding	1,500.00	
10		Awolowo leaf	For malaria		12, 000.00
11	Olubriala	Abura tree leaf	For blindness and teeth problem		15, 000.00
12	Udah		For pregnant women		18, 000.00
13	Ukazi	Ukazi	Making good soup	1,500.00	
14	Akukwougu	Pumpkin leaf	Making good soup	2,000.00	
15	Itaibongeto		Rain boot, elephantiasis		25, 000.00
16	Udenshi		To cure poison and convulsion		21, 000.00

Table 2: Contd.					
		Total Monthly Value		**₦15,500 X 4 = 62000 X 12**	**₦148,000 X 12**
		Annual Total Value		**₦7,44,000**	**₦1,776,000**

Source: Field Survey 2017

In the above table, the weekly value (₦15, 000) is multiplied by 4 to get the monthly value (₦62,000). Then both value is multiplied by 12 to get the annual value which is (₦2, 520,000).

From the focus group discussions, the fishermen/women said that, "fishing activities is a mystery, in that sometimes you will go out for fishing for a weak you will not have any fish to sell but you must always come back with the ones to eat called 'chop fish'. Then, some days when you do not even expect, you will come back with something worth thousands of naira. That is why they said fishing activities is a mystery and the minimum profit they make in each month ranges from eighty thousand nairas (₦80, 000.00) – one hundred and seventy thousand naira (₦170, 000.00)". The various types of fish usually caught and their estimated farm – gate prices are shown in Table 3.

Table 3

S/N	Name of fish		Farm – Gate Price Per Month(₦)
	Native	**English**	
A	Sengi	Cat fish	11,000
b	Songu	Sardine fish	12,000
C	Ndeghe	Mullet fish	11.000
D	Agbara	Red snapper fish	10,000
E	Afari		7,000
F	Tungbo	Bonga fish	9,000
G	Ana	Broke marriage	7,000
H	Atagbala	Tilapia fish	8,000
I	Doro	Barracuda fish	7,000
J	Ishila	Mud fish	4,000
K	Ikili		6,000
L	Ikoli	Sea crab	8,000
M	Ekenge	Land Crab	4,000
N	Erem		9,000
O	Fatafata		9,000
P	Mgbe	Oyster	10.000
Q	Esem	Periwinkle	8,000
R	Oporo	Prawn	7,000
S	Nfirihia	Cray fish	6,000
T	Ngolo	Of Ingo	8,000
U	Igbu	Croaker fish	9,000
		Total Monthly Value	**170, 000.00 X 12**
		Annual Total Value	**₦2,040,000.00**

Source: Field Survey 2017

From the focus group discussions, some farmers said that "they do not make much money because they are not large-scale farmers but small-scale farmers. And that, the high tide sometimes distort their plants because of the geographical location of the mangrove forest and that they only make good money from the palm kernel tree because of its varieties of usage. Cassava, firewood, and cucumber also give them good money but not all the time. And the market for traditional poles is coming occasionally". They estimated their income potential as shown in Table 4.

Table 4

S/N	Resources	Farm – Gate Price Per Month (₦)
a.	Avocado pear	25, 000.00
b.	Okro	10. 000.00
c.	Fresh pepper	12, 000.00
d.	Sugar cane	7, 000.00
e.	Tangerine	4, 500.00
f.	Bitter leaf	6, 000.00
g.	Cassava	30, 000.00
h.	Maize	11, 000
i.	Coconut	45, 000.00
j.	Palm kernel	50, 000.00
k.	Pumpkin leaf	16, 000.00
l.	Water leaf	5,500.00
m.	Shewa shop	6,500.00
n.	Fire wood	14, 000.00
o.	Traditional poles	8, 000.00
	Total Monthly Value	**250,000.00 X 12**
	Annual Total Value	**₦ 3,000,000.00**

Source: Field Survey 2017

INTERPRETATION

Historically, there was a traditional law, that; those mangrove forests, that are very close to the community, should not be cut for the following reasons;

- The mangrove forest serves as a windbreaker from the wind coming from the Atlantic Ocean because the community is very close to the Atlantic Ocean.
- It protects the community shore by way of blocking the waves coming from the Ocean
- It protects the community from high tide and erosion
- It helps the aged men and women who cannot go very far to fetch periwinkle, prawns, crayfish, fish, herbs, etc.
- The mangrove forest also serves as campground for fishing, hunting and farming activities.
- The mangrove roots provide fish habitat close to the community

During the land reclamation, which resulted in the clearing of the mangrove trees, no compensation was paid by the government to the natives for this loss of natural resources as the emphasis was on increasing land supply.

The usefulness benefits and importance of the mangrove forest which makes it valuable to the host community necessitates the payment of adequate compensation when the mangrove is cleared for any form of development because the mangrove forest can be valued professionally. The findings also indicate that;

- The hunters using the mangrove forest don't make the same money following their level of experience and commitment.
- The herbalists using the mangrove forest also charge sick people according to their relationship with the person and the level of their financial status
- The farmers complained that sometimes high tide decreases their produce and thieves don't allow their farm

produce to remain for them.

- The fishermen/women also said that, for you to make good money in fishing occupation, your experience plays a vital role and your commitment matters a lot.
- Community dwellers sometimes go to the mangrove forest to fetch firewood and other mangrove forest resources for their consumption and not for sale
- Most of the people living in Opobo town depend on the mangrove forest and its resources for their livelihood.
- The findings ascertained indicated that, historically, there was a binding law in Opobo town on the mangrove forest, which nobody is allowed to tamper with because of its significances to the host communities.

EFFECT OF LAND RECLAMATION

Land reclamation is the gain of land from the sea, or coastal wetlands *e.g*. for agricultural purposes, industrial use or port expansions, etc. (Kahn and Kemp, 1985).

Reclaiming land from the sea has become a popular way to develop coastal regions like in Opobo town, but destroying wetlands and mangrove forests leave populations vulnerable to the ravages of the rising seas and other negative tendencies. Historically, when the town was discovered, mangrove forests covered a very vast proportion of the land mass. However, during the 19th Century, much of these mangrove forests were cleared in order to make space for land reclamation projects and keep up with the demands of the fast-growing population for developable land without considering the value of the mangrove forest, its resources and the long-term effect of its destruction. Destroying mangrove forests and shallows in Opobo town may appear to bring benefits in the short term, but in the long term it can cause ecological disaster and render the community poor in natural resources.

Land reclamation causes flooding, destroys the natural ecosystem, natural landscapes can have adverse effects on the marine environment and can have potentially disastrous consequences in the future. Marine habitats are permanently lost where land is reclaimed from the sea.

Over time, the land is shaped and reshaped and eventually reclaimed by the ocean. The process is a slow one that nature has time to adapt to, but if it takes place too quickly serious damage can be done – and coastal populations are left at risk.

The practice may be atemporary solution to land shortages, but it means the destruction of ecosystems and a loss of security for not only Opobo town but the Nigerian economy and society.

RECOMMENDATIONS

Proper and efficient information on exploitation pattern of mangrove forest products in space and over time is important and its impacts on the ecosystem are vital to designing a suitable management plan. The study reveals that mangroves are one of the most vulnerable or defenseless ecosystems in the world. They are on the verge of destruction due to a continuous increase in anthropogenic (human) activities stresses along the coastal areas and climatic unpredictability or inconsistency. Coastal wetlands are constantly threatened by the pressures of profit. It is therefore recommended as follows;

- Unregulated land reclamation should end.
- Coastal shallows, wetlands and other natural ecosystems should have legal protection. It is difficult to restore large areas of wetlands that have been covered with tarmac, concrete or buildings, but we should not wait till nature punishes us with tidal waves, floods, and red tides before we decide to give ecosystems their proper place. It is a lesson we cannot afford to learn.
- Land reclamation should only be carried out after weighing the economic cost associated with the loss of such natural resources.
- The environmental effects on species and habitats and ecosystem processes are still poorly understood and require further monitoring, assessment, research, and management.
- Mangrove forest should be considered as a rich natural resource and put an end to the indiscriminate destruction.
- Further research should be carried out on the value of mangrove forest and its resources and the long-term effects of land reclamation in coastal communities studied.
- Decision makers/government should support research work in advance level and collaborate with institutions and registered professional estate surveyors and valuers to draft out, how to sustain, manage and provide a base value for mangrove forest and its resources

CONCLUSIONS

The impacts of land reclamation on the livelihoods of the coastal communities like Opobo town, especially mangrove forest users and community dwellers, were serious affected and nearby mangroves were degraded. The effect of this intervention was observed to be long-term, contrary to the claims made by the project proponents. Mangrove forest users and other coastal inhabitants incurred monetary losses, which were neglected by the project proponents, who also failed over the issue of compensation.

This work attempts to establish a fact or evidence that the land reclamation was done in Opobo town was done without ascertaining the value of mangrove forest and its resources for adequate compensation which in return caused hardship to coastal population (the Opobo people), especially mangrove forest users and community dwellers who solely depended on mangrove forest and its resources as their source of livelihood.

A socio-economic survey like the face-to-face interview, site visitation, questionnaires, interview, and focus group discussion was carried out on a targeted population of the mangrove forest users and community dwellers to obtain information on how the land reclamation had affected their livelihoods in terms of incomes, job opportunity, fishing activities, pollution, etc. This study intended to prove that environmental dreadful conditions were caused by the project proponent not comparing and ascertaining the value of the mangrove forest and its resources loss before and after the reclamation considering the issue of loss and adequate compensation. Losses are valued in monetary terms.

The purpose of valuing damages is to allow affected persons to claim compensation in monetary terms. This study emphasized losses through mangrove degradation and losses as a result of mangrove forest resources declining. In addition, losses incurred by cockle farmers and the community dwellers. It is noted that economic loss, is unrecoverable in the Common Laws. This study does not advocate monetary compensation to each affected individual or families caused

as result of land reclamation in Opobo town but prefers to ascertain the value of mangrove forest and its resources loss due to land reclamation and long-term aid to regenerate rural livelihood in Nigeria using the Cookey's Creek in Opobo town as a study site and for this base value of mangrove forest and its resources to be achievable in Nigeria, the Nigerian government (decision makers) should work with institutions, professional and registered estate surveyors and values.

REFERENCES

1. *Abere, S. A. &Ekeke, B. A. (2011).The Nigerian Mangrove and Wildlife Development. In: Aiyeloja A. A. &Ijeoma H. N. (Eds). Book of Reading in Forestry Wildlife, Management and Fishery.Topbase Nigeria Limited, in conjunction with Green Canopy Consultant Limited.*
2. *Ajewole, O. I. (2016). Ecological Economics of Mangrove Forest in Nigeria. Forestry Association of Nigeria, Conference Proceedings in Port Harcourt: Rivers State University of Science and Technology, (pp. 697-708). Port Harcourt: Rivers State.*
3. *Akpofure, E. A. &Ekeke, B.A. (1995). Mangrove (Rhizophoraracemosa) Plantation established in the Nigeria Delta of Nigeria, Nigeria Journal of Agricultural Teachers' Education. Vol. 2,195-198.*
4. *Barbier, E. B., Sathirathai, S. (2001). Valuing Mangrove Conservation in Southern Thailand. Contemporary Economic Policy. 19 (2) 109–122.*
5. *Dixon 1989; Lucy 2006.*
6. *Ekeke, B. A. (2000). The Nigerian Mangrove and Community Development, Paper Presented at the Workshop on Fisher Folk Community Based Coastal Resource, Management, Sri Lanka 11-15 Nov. 2000.*
7. *Ekeke, B.A &Ariwado, J.O. (2000).Floristic Diversity and Natural Regeneration of the Mangrove of Nigeria.Delta Agric, 7: 48 – 55.*
8. *FAO Forestry (2010) Global Forest Resources Assessment.Food and Agriculture Organization of of the United Nations, Rome, Italy.*
9. *FAO (2007).The World's Mangroves 1980-2005, FAO Forestry Paper 153.Food and Agriculture Organization of the United Nations.*
10. *Garrod, G., & Willis, K.G. (1999).Economic Valuation of the Environment, Edward Elgar, Cheltenham.*
11. *Kahn, J. & Kemp, W., (1985). "Economic Losses Associated with the Degradation of an Ecosystem", Journal of Environmental Economics and Management, 12: 246-263.*
12. *Kathiresan, K. &Blingham, B.L (2001).Biology of Mangrove and Mangrove Ecosystems.Advances in Marine Biology. 40: 81 – 251.*
13. *Millennium Ecosystem Assessment (2005). Ecosystems and Human Well-Being: Current State and Trends, Esisland, Washington, DC (2005) (Chapter 19)*
14. *Obadimum, O. O., Owese T., Bolaji-Olutunji, K. A. &Abi, E. A. (2016). Mangrove Forests in Nigeria: Forestry Association of Nigeria. A Penoramic View (FAN). Conference Proceedings in Port Harcourt, Rivers State University of Science and Technology, 3-11.*

15. *Omokhua, G. E. &Ofodile, E. A. U. (2011).Mangrove Floristics, Regeneration, Management, Utilization and Services.The Nigerian Mangrove and Wildlife Development. In: Aiyeloja and Ijeoma H. N. (eds). Book of Reading in Forestry, Wildlife Management and Fishery.TOPBASE NIGERIA LIMITED, in Conjunction with Green Canopy Consultant Limited.*
16. *Pearce, D. W. & Turner, R. K. (1990).The Economics of Natural Resources and the Environment, London, Harvester-Wheat Sheaf.*
17. *Robinson, A., Robinson N. & Soon W. (2007). Environmental Effects of Increased Atmospheric Carbon Dioxide, Journal of American Physician and Surgeons 12:79-90.*
18. *Sinden, J. A. (1994). "A Review of Environmental Valuation in Australia", A Review of Marketing and Agricultural Economics, 62 [3]: 337-369.*
19. *Spalding, M., Kainuma, M., Collins, L. (2010).World Atlas of Mangroves. London, UK; Washington DC: Earth Scan.*
20. *TEEB, (2010).Pushpam Kumar (Ed.). The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations, Earth Scan, London and Washington (2010).*
21. *Umeh, J. A. (1977). Feasibility and Viability Appraisal, Ibadan: Onibonje Publishers*
22. *UNEP (2011).Environmental Assessment of Ogoniland. UNEP, Nairobi, KENYA.*
23. *UNEP-WCMC (2006). "In the Front Line: Shoreline Protection and other Ecosystem Services from Mangroves and Coral Reefs", UNEPWCMC, Cambridge, UK 33 pp.*