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ARTICLE

Aspects of Impacts of Proposed Badagry Deep Sea Port on the Ecosystem and Livelihood of Fishing Communities in Badagry, Lagos State, Nigeria

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ABSTRACT

Federal government of Nigeria, in collaboration with Lagos State Government proposed development of a seaport in Badagry. This research examined and documented the current state of the ecosystem and livelihood of thirteen communities that will be impacted by the proposed deep-sea port. Qualitative and quantitative approaches were used for the study. Review of secondary data was used to investigate the demographic data of the community while Participatory Rural Appraisal was conducted for 300 households in the communities. Majority of the sampled respondents were in the age range of 45 years and above with females (60%) more than males (40%) in the entire population sampled. Educational levels of the respondents are relatively low. The majority of the sampled households have multiple livelihood systems that keep them engaged throughout all seasons of the year. Capture fisheries is the major occupation in the study area and it is complemented with aquaculture. Existing groups are not strong enough to operate as a pressure group to influence policies and regulate market prices, which has been identified as a major limitation in the study area. There was no regular training or capacity building. Hence the groups were not operating as a business enterprise and could not expand or increase capacity. Consequently not able to contribute significantly to poverty alleviation and increase employment opportunities in their localities. This document will serve as one of the guides to the government for decision-making and compensation to the communities.

1. Introduction

The ancient city of Badagry was founded in 1425 [1]. It is located along the ancient coast of West Africa, now known as the Bight of Benin. By the 1600s, this ancient city had become a thriving community reputed for trade in salt produced by evaporation at Gberefu. This legitimate trade soon gave way to the obnoxious slave trade and for four hundred years, slave trade dominated all other interests in Badagry [2]. By 1740, Badagry had become

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a thriving town for its sole industry - the slave trade, courtesy of the Europeans and Americans, exporting through the Creeks and Lagoon and across Atlantic to Europe and America.Badagry is presently a thriving tourist site that attracts people from all over the world [3]. It is equally well known for fishing.

Over 200 rural fishing communities are adjoined to this ancient city and some of the prominent ones are Apa, Ajido, Kweme, Ibereko, Iworo, Ilogbo, Ikoga, Igborosun, Ilado, Imeke, Topo-Idale, Aradagun, Toga, Ajara, Imeke, Gbaji-Yekke, Ganyaingbo, Koga, Pota, Tohun, Erikiti, Mosafejo, Iragbo, Wesere; Gberefu, Yovoyan, Gayingbo, Agonvi, Agonrin, Hoke-daho, Kujinada, Aivoji, Asakpo, Sheik modawa, Agonvi town, Ganyingbo town and Gbaji yeke tome [3].

Recently, federal government in collaboration with Lagos State Government, proposed to site a sea port in Badagry. The proposed port will thus serve as a primary catalyst for the economic development of Lagos State. It will provide a quality solution for the shortage of multi-cargo capacity and ensure that the infrastructure of Lagos State is aligned to and sufficient enough to support the growing Nigerian and West African markets for the future. The project area covers 13 communities and by implication will require access to land to explore, develop and operate the sea port project. This land is already occupied in some manner, as people physically reside there and uses free land as a means of livelihood. As a result, acquiring land by the project will lead to physical displacement, and loss of other assets that might lead to loss of means of livelihood.

The study is essential due to the following problems that have been identified: This project is of international importance between Nigeria and the Republic of Benin, and it would displace thirteen (13) fishing communities. The Lagoon within this area and sea beaches are breeding grounds for sea turtles that have been placed on the danger list. Besides, shrimps from this beach contribute to the over $56,000,000 realized from shrimp export. The project will have a great impact on the sustainable livelihoods of local communities. The project will impact the physico-chemical characteristics of the Lagoon and the Sea beach. Collapsing of thriving fisheries will occur. Destruction of the ecosystem and natural habitats of endemic fauna and flora, destruction of nesting and breeding grounds of endangered biodiversity like sea turtles would also occur.

Despite the economic, ecological and socio-cultural importance of this area, there is no baseline data for future reference and scenario development for policy formulation and implementation. Hence, this study aims to investigate aspects of the impacts of the seaport on: Livelihood of the people; Farming system; Crops being propagated, harvested and processed; Fishing/aquaculture inputs and outputs; Farming inputs and output; Fishing crafts and gears; Catch compositions; Earnings from fisheries and sources of income.

2. Literature Review

Construction of port facilities involves considerable modification of estuarine and coastal habitats through reclamation, physical alteration of the shoreline, dredging and disposal of soil [4]. Environmental impacts include destruction of aquatic habitats, loss of seagrass beds, salt marshes and mangroves and sedimentation or erosion caused by altered bathymetry and water circulation patterns [5]. Permanent loss of habitat and biological productivity occurs where structures occupy the foreshore or seabed, or where major dredging works are performed to establish harbours and shipping channels [6].Changes in benthic communities also result from the replacement of native habitats with artificial structures. These artificial substrates attract exotic fouling communities that may subsequently invade other habitats in the port environment, resulting in reduced diversity of native communities [7]. Sediment transport processes are altered at coastal ports both through reflection of waves from port structures and hydrographical modifications caused by dredging. This has led to changes in seabed habitats and marine communities in areas such as Portland Harbour in Victoria, where protective works are required to prevent ongoing erosion of the adjacent coast [8]. Construction of marinas has similar impacts to those outlined for port development, although generally at a smaller and more localized scale [4]. In some areas, such as the Gipps land Lakes in Victoria, the proliferation of marinas and related facilities has grossly altered the nature of the shoreline and inshore habitats [8].

3. Materials and Methods

3.1 Study Area

The study was carried out in Badagry within latitude 6°25N 2°53/6.42°67°N and longitude 2.88°E [9]. It shares boundaries with Ogun State both in the North and in East and is bounded on the west by the Republic of Benin. In the South, it stretches for 180 kilometers along the coast of the Atlantic Ocean. It consists of Lagoons and Creeks. The sampling stations are thirteen communities (13) namely Gberefu, Yovoyan, Gayingbo, Agonvi, Agonrin, Hoke-daho, Kujinada, Aivoji, Asakpo, Sheik modawa, Agonvi town, Ganyingbo town and Gbaji yeke tome.

3.2 Data Collection

The project was carried out using secondary data and primary data. The secondary data involved a review of proposal documents alongside with the social and environmental impact assessment conducted in affected communities. The study covered a period of twelve (12) months and data were collected using a combination of field studies and survey. A random sampling technique was used for this study. Participatory and structured questionnaires were used for the collection of primary data. The population of the study comprises of focus groups (youths, Chiefs and Baales, women, men, children, and disabled/handicapped) some of which also double as stakeholders/head of households within the study areas. A total of 300 households were sampled in the communities for the administration of questionnaire and interview. The sample size was selected using standard method described by Yamane [10].

Field studies were carried out to determine the following: General farming system; types of technology being adopted; number of people involved in the activities; types of crops; fishing/farming inputs and outputs; types of fishing crafts/ gears, uses and sizes; catch compositions; catch per unit effort; earnings from fisheries and other sources of income.

Survey work included reconnaissance visits, administration of structured questionnaires and group discussions to ascertain the existing socio-economic conditions and livelihood of the indigenous people.

4. Results and Discussion

Based on the structured questionnaires adopted for this study, some responses are qualitative in nature such as those that indicate availability or none availability, while some questions required quantitative answers. In addition some respondents were unwilling to give estimate in term of quantity of what they possess. The relative impact of the project on the visited communities is as presented in Table 1. The communities that are going to be completely displaced and relocated are Gberefu, Yovoyan, Agonvi sea beach, Gayingbo sea beach, Hoke daho, Kujinada, Agorin town and Mudawa community. The displacement will result in their loss of forest, access to the ocean, creek, lagoon, fishing and farm land. In relative terms, fishing will be the most harshly affected (lagoon, creek and marine). This kind of displacement of people of their main livelihood has been documented in regards to how oil sector generally has negative impacts on fisheries livelihoods and coastal communities, however these effects and their mechanisms vary across locations, ecosystems, species, and specific activities and groups [11].

As recorded during this study, more male headed households (MHH) will be impacted than female headed households (FHH) although the margin of impact is not significant (p=0.5). This insignificant gender difference indicated that both males and females are active in the social economy of the communities. Members of the community that will be mostly affected (49%) are those that have all their means of livelihood within the community. This group does not have alternative income source outside the community and are mostly aged men and women. Those moderately impacted constitute about 27% of the community members and are those that have access to financial facilities (bank, cooperative loans etc.) and have alternative livelihoods. About 24% of the community members will be least affected. These groups are literate that have access to financial facilities such as bank and cooperative loans. In addition, they have alternative livelihoods with dual homes within and outside the community.

Table 1. Relative impact of the project on the communities

Level/pattern of impact	Communities/groups
(a) Communities that will lose land but not be resettled	i. Gbaji yeke ii. Gayingbo town iii. Agonvi town etc
(b) Communities that will be resettled and lose land	i. Gberefu ii. Yovoyan iii. Agonvi sea beach iv. Gayingbo sea beach v. Hoke daho vi. Kujinada vii. Agorin town viii. Mudawa community
(c) Those at the resettlement sites who will lose land for the resettlement sites	i. Gberefu
(d) Not lose land and not be resettled but who may otherwise be affected	i. Tenants to land owners ii. Market associations iii. Producers associations iv. Transport associations

Table 2 contains the total number of livelihood encountered in the fishing communities. The total number of livelihood encountered was 73. The numbers contained in the table indicate the relative importance of the livelihood. N/A indicates that the livelihood is not available within the community. When available in very low significance it is simply classified as available. The top 5 livelihood activities for the Project Area are coconut farming, capture fishing, cassava farming, vegetables farming and mat weaving. In general, the first five livelihoods can be summary as:

i. The types of coconut planted in the affected communities are improved and local varieties.
ii. The type of fisheries in the affected communities

are categorized into marine artisanal capture fisheries, lagoon capture fisheries, creek/swamp capture fisheries while the aquaculture systems in practice are earthen ponds, concrete ponds and cage based.

iii. The types of cassava planted in the affected communities are the 7 months, 9 months and 12 months varieties.

iv. The 5 main types of vegetables planted in the affected communities are Amaranthus, tomato, pepper, okro and fluted pumpkin.

v. The types of mart weaving produced in the affected communities can be categorized as big, medium and small size.

Table 3 showed the synopsis of the livelihood analysis for the communities. Households surveyed shows the community employ a range of different livelihood strategies such as tree and arable crop farming (coconut, cassava, maize, cowpea, palm tree, raffia palm, vegetables, water melon, melon bread fruit, guava, sweet potato, yam, ground nut, pineapple, etc), fishing (ocean, marine, lagoon, creek, swamp and aquaculture), livestock (cow, pig, chicken, duck, rabbit, cat, dog, pigeon, grass cutter etc.) trading (food stuff, provisions, cosmetics, beer parlor, restaurant, etc.), artisans (brick laying, furniture, electrician, plumbing, photography, etc), including paid employment, casual labour, government and complementary family supports. In most cases, households benefit from more than one income generating activities in order to keep with the semi-urban economy. Coconut farmers and fisher folks appear to be the richest among other agricultural enterprises. Coconut farming is the largest sources of income in all the communities surveyed as shown in the ranking status. However, no household is specific with their earning income from agricultural activities.

There is no cultural restriction to gender on the type of livelihood activities. However, apart from few women who function effectively in the on-farm activity, most women engage in the off farm, marketing and nonfarm activities. Mostly, the male adults are into tree and arable crop farming, artisanal fishing and livestock (cow, pig, dog, grass cutter and pigeon) farming. The adult females are into fish processing, mat weaving and off-farm activities. The youth apart from few, who engage in farming and processing, they function majorly at the non-farm activities. Coconut, cassava and capture fisheries are the three major livelihoods common to all the affected communities. Some of the observations in this study especially on the fisheries were not too far distinct from the reported proposed impacts of oil exploration on wetlands in the Niger Delta of Nigeria [12].

The seasonal calendar of Gberefu community for livelihoods planning was shown in Table 4. The most frequent activities (engage in throughout the year) were livestock /fishing, off farm activities, marketing and non-farm activities.

Table 2. Livelihood systems of the communities

S/n	Livelihood	Gberefu	Yovoyan	Ganyingbo sea beach	Kujinada	Agonrin town	Agonvi town	Agonvi sea beach	Gbaji yeke tome	Hoke daho	Sheik modawa	Ganyingbo town
1	Coconut	13	7	14	Available	Available	Available	Available	Available	57	Available	Available
2	Cassava	30	46	11	Available	Available	Available	Available	Available	59	Available	Available
3	Maize	25	7	9	Available	Available	Available	Available	Available	18	Available	Available
4	Palm tree	Available	Available	4	Available	Available	Available	Available	Available	46	Available	Available
5	Marine fishing	Available	43	Available	Available	Available	N/A	Available	N/A	N/A	N/A	N/A
6	Lagoon fishing	Available	N/A	5	Available	Available	Available	N/A	N/A	Available	N/A	Available
7	Creek fishing	Available	N/A	N/A	Available	N/A	Available	N/A	N/A	Available	N/A	N/A
8	Swamp fishing	N/A	N/A	N/A	N/A	Available	Available	Available	Available	N/A	N/A	Available
9	Aquaculture	Available	1	Available	Available	Available	Available	N/A	Available	7	Available	Available
10	Amarantus	Available	Available	Available	Available	Available	Available	Available	Available	23	Available	Available
11	Tomato	8	10	9	Available	Available	Available	Available	Available	25	Available	Available
12	Pepper	12	3	9	Available	Available	Available	Available	Available	16	Available	Available
13	Chochorous	Available	2	9	Available	Available	Available	Available	Available	Available	Available	Available
14	Pumpkin	Available	N/A	9	Available	Available	Available	Available	Available	Available	Available	Available
15	Okro	15	10	9	Available	Available	Available	Available	Available	13	Available	Available
16	Water leave	Available	N/A	Available	N/A	Available	Available	Available	Available	N/A	Available	Available
17	Bitter leave	Available	N/A	Available	N/A	Available	Available	Available	Available	29	Available	Available
18	Saint leave	Available	N/A	Available	N/A	Available	Available	Available	Available	10	Available	Available
19	Yam	11	N/A	Available	Available	Available	Available	Available	Available	2	Available	Available

20	cowpea	Available	6	Available	Available	Available	Available	Available	Available	11	Available	Available
21	Sugarcane	Available	1	Available	N/A	Available	Available	Available	Available	7	Available	N/A
22	Ground nut	Available	2	Available	Available	Available	Available	Available	Available	1	Available	N/A
23	Sweet potato	10	3	Available	Available	Available	Available	Available	Available	3	Available	N/A
24	Banana	Available	1	Available	Available	Available	Available	Available	Available	19	Available	Available
25	Cow	Available	Available	Available	Available	Available	Available	Available	Available	6	Available	Available
26	Plantain	Available	1	Available	Available	Available	Available	Available	Available	24	Available	Available
27	Guava	Available	N/A	N/A		Available	Available	Available	N/A	2	Available	Available
28	Pawpaw	Available	N/A	Available	Available	Available	Available	Available	Available	16	Available	Available
29	Cashew	Available	Available	Available	Available	Available	Available	Available	Available	3	Available	Available
30	Pineapple	Available	N/A	Available	N/A	Available	Available	Available	Available	22	Available	Available
31	Water melon	Available	N/A	Available	N/A	Available	Available	Available	Available		Available	Available
32	Mango	Available	1	Available	Available	Available	Available	Available	Available	43	Available	Available
33	Sheep	Available	Available	N/A	Available	Available	N/A	Available	N/A	N/A	Available	N/A
34	Goat	Available	Available	Available	Available	Available	Available	Available	Available	21	Available	Available
35	Chicken	Available	Available	Available	Available	Available	Available	Available	Available	35	Available	Available
36	Pig	Available	Available	Available	Available	Available	Available	Available	Available	9	N/A	Available
37	Guinea fowl	Available	Available	Available	Available	Available	Available	Available	Available	Available		N/A
38	Duck	Available	Available	Available	Available	Available	Available	Available	Available	19	Available	Available
39	Rabbit	Available	Available	Available	Available	Available	N/A	Available	Available	1	Available	N/A
40	Snail	Available	Available	Available	Available	Available	Available	Available	Available	N/A	Available	N/A
41	Cat	Available	Available	Available	Available	Available	Available	Available	Available	11	Available	Available
42	Dog	Available	Available	Available	Available	Available	Available	Available	Available	19	Available	Available
43	Ram	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Available	N/A
44	Sand mining	Available	N/A	4	N/A	Available	Available	N/A	N/A	Available	N/A	N/A
45	Raffia palm	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
46	Fish smoking	Available	55	Available	Available	Available	Available	Available	Available	Available	Available	Available
47	Ifin (mart)	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
48	Trading	35	27	11	46	Available	Available	Available	Available	Available	Available	Available
49	Maize/ cassava processing and mart weaving	Available	2	Available	Available	Available	Available	Available	Available	Available	Available	Available
50	Firewood	Available	5	Available	Available	Available	Available	Available	Available	Available	Available	Available
51	Marketing	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
52	Artisans	Available	11	5	Available	Available	Available	Available	Available	Available	Available	Available
53	Paid employment	7	14	Available	Available	Available	Available	Available	Available	Available	Available	Available
54	Palm wine tapper	Available	1	Available	N/A	Available	Available	Available	Available	Available	N/A	Available
55	Farm labour	Available	2	Available	Available	Available	Available	Available	Available	Available	N/A	Available
56	Horse	N/A	N/A	N/A	Available	Available	N/A	Available	N/A	N/A	N/A	N/A
57	Giant rat	N/A	N/A	Available	Available	N/A	Available	Available	N/A	N/A	Available	N/A
58	Bread fruits	N/A	N/A	N/A	N/A	Available	Available	N/A	N/A	3	N/A	Available
59	Citrus	Available	N/A	Available	Available	Available	Available	Available	Available	14	Available	Available
60	Cocoyam	Available	N/A	N/A	Available	Available	Available	Available	N/A	Available	Available	Available
61	Chap-chap	N/A	N/A	N/A	N/A	Available	N/A	N/A	N/A	4	N/A	N/A
62	Turkey	N/A	N/A	N/A	Available	Available	Available	Available	Available	1	Available	N/A
63	Moringa	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Available	Available	Available
64	Pigeon	N/A	N/A	N/A	N/A	Available	N/A	Available	N/A		Available	N/A
65	Grass cutter	N/A	N/A	N/A	Available	Available	N/A	Available	N/A		N/A	N/A
66	Aloe vera	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A
67	Lemon grass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9	Available	N/A
68	Oyinkekere	N/A	N/A	N/A	N/A	N/A	N/A	Available	N/A		Available	N/A
69	Ahokun	N/A	N/A	N/A	N/A	N/A	N/A	Available	N/A		Available	N/A
70	Ozini	N/A	N/A	N/A	N/A	N/A	N/A	Available	N/A		Available	N/A
71	Onion	N/A	N/A	N/A	N/A	N/A	N/A	Available	N/A		N/A	N/A
72	Isapa	N/A	N/A	N/A	N/A	N/A	N/A	Available	N/A	N/A	Available	N/A
73	Native doctors (herberlist)	Available	Available	Available	Available	Available	Available	Available	Available	2	Available	Available

Table 3. Livelihood Analysis for the Communities

Livelihood Activities	Ranking	Tools and implement	Sources of funding	Market options	Market distance
Rain fed farming		Land	Cooperatives	Agbalata	10km
Cassava	2	Water	Thrift	Seme	20km
Maize	3	Hoe	Pension	Igoga zebe	50km
Sweet potato	8	Tractor	Savings	Agbara	50km
Cowpea	7	Cutlass		Lusada	60km
Yam	9	Fertilizer		Owode	
Melon	13	Herbicides		Agunmo	50km
Ground nut	10	Pesticides		New market Ajara	7km
Pineapple	14	Manure			
Water melon	15	Sprayer			
		Labour			
		Pumping machine			
Irrigation farming					
Tomato	4				
Pepper	4				
Okro	5				
Chochorous	6				
Ugwu	6				
Amarantus	6				
Water leave	6				
Bitter leave	6				
Tree crop					
Coconut	1				
Mango	11				
Pawpaw	15				
Cashew	11				
Palm tree	1				
Plantain	12				
Banana	12				
Livestock		-Pen house	Cooperatives	Agbalata	10km
Cow	1	-Vaccines and	Thrift	Seme	20km
Sheep	7	treatment by	Pension	Igoga zebe	50km
Goat	3	veterinary officer	Savings	Agbara	50km
Pig	2	-Lantern for heating		Lusada	60km
Guinea fowl	4			Owode	
Duck	10			Agunmo	50km
Rabbit	7			New market Ajara	7km
Chicken	4				
Snail	8				
Cat	9				
Dog	5				
Alegator	11				
Fishing		Net	Cooperatives	Farm gate	2km
Marine		Boat/engine	Thrift	Inside the community	
Lagoon		Ponds	Pension		
Creek			Savings		
Aquaculture					
Off-farm activities				Farm gate	2km
-Smoking of fish, cray fish, sea tortoise				Inside the community	
-Cassava processing to garri, apran, fufu					
-Sun drying of cowpea, melon, maize					
Marketing Activities				Farm gate	2km
-Fish catch is sold to women who sell some to traders and process the rest as smoked fish				Inside the community	
-Crop produce is sold to women and also at farm gate. Women process and market the product					
-Produce by youth is sold at farm gate to traders who take it to market					
-Livestock are sold to traders/women who take it to market					

Non-farm activities Tailoring Art and printing Textile design Brick laying Culture design Aluminum Civil servants Teaching Traders Carpentry Plumbing Hair dressing Mechanic Welder Hunting Transportation Clergy Herbalist Sand mining Smuggling Car dealers					

Table 4. Seasonal Calendar of Gberefu community for livelihoods planning

Months	**Mar**	**Apr**	**Ma**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
Activities 1.Rain fed farming -Land clearing (M/F) -Ridges (M) -Planting (M/F) -weeding (M/F) -Harvesting (M/F)	 * 	 * 	 * * 	 * 	 * 	 * 						
2.Irrigation -Land clearing (M/F) -Planting (M/F) -Weeding (M/F) -Harvesting (M/F)									 * 	 * * 	 *	 *
3. livestock /fishing (M&F)	*	*	*	*	*	*	*	*	*	*	*	*
4. Off-farm Activities ● Drying (F) ● Frying (F) ● Bagging (M&F) ● Store/preserve.(M&W)	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *	 * * * *
5.Marketing Activities (M&W)	*	*	*	*	*	*	*	*	*	*	*	*
6. Non-farm Activities ● Transportation (M) ● Artisans (M&F) ● Abattoir(M&F) ● Trading (M& F) ● Civil servant/pension M&F ● Clergy ● Herbalist	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *	 * * * * * * *
7. Income Expenditure	 *	 *	 *	* *	* *	* *	* *				*	

Although Badagry is a fishing community, the livelihoods are both water and land based as presented in Table 5. The household classification below gives the communities' description of their local criteria on how the project will impact on members of the communities. Some communities believe the project will impact on certain gender and sex differently. Some however, believe the age distribution is a major dividing line for assessing levels of impact while some opined that indigenes of the communities have all their livelihood activities within the communities than non indigenes. Lastly, some communities affirmed that the project would impact more on people who carry out all their livelihood activities in the swamps which are being displaced than others who hardly go to the swamps. The general impacts are itemized below:

i. Youth will no longer be able to mine sand.
ii. Women will have to spend more money and time to access markets.
iii. Capture fishing (marine, lagoon, creeks and swamps) will be restricted in the resettlement site.
iv. Fish smoking by women will be restricted.
v. Loss of income for people doing aquaculture because they cannot stock new fingerlings.
vi. Farmers may not have proportional farm lands taken by the project in the resettlement sites.
vii. No income for crop farmers (coconut, palm tree, cassava, cashew, mango, maize, vegetables etc.) until the first harvest in the resettlement site e.g. coconut- 7 years, cassava- 9 months.
viii. Women will spend more money to buy leaves (ifin) used for making mart until the first harvest in the resettlement site.
ix. There will be high mortality rate for livestock because of adaptability to new environment.
x. Men will spend more money to maintain their social life because the local gin and wine made from their palm tree cannot be accessed until the first harvest in the resettlement site.
xi. Processors (women) will spend more money in buying farm produce (cassava, maize etc.) for processing from the market in place of buying from the communities.
xii. Youth and boys will spend more time in fetching firewood.
xiii. Artisans will spend more time and money on transport to locate their clients.
xiv. No income for native doctors who depend on herbs until the next harvest in the resettlement site.
xv. Gberefu community will lose patronage on their tourist center (slave trade point of no return).
xvi. Agonrin will lose patronage on their tourist center (southern beach).
xvii. Loss of income for local transport associations in the displaced sites.
xviii. Loss of income for people hawking in the displaced site.
xix. Affected communities will spend more time and resources in rebuilding trust and social integrations in the resettlement site.
xx. Traders and farmers will lose financial capital pending the time they are able to rebuild their trust and social integrations in the resettlement site. The above divulged opinion of the respondents in the sampled communities is in line with the report [4,5].

Table 5. Classification by Location of some livelihood activities in the impacted areas

Activities	Land based	Water based
Aquaculture/fish farming		●
Marketing of farm produce	●	
Marine fishing		●
Lagoon fishing		●
Creek/swamp fishing		●
House renting	●	
Fish smoking	●	
Tourism	●	●
Trading	●	
Livestock	●	
Mat weaving	●	
Artisans	●	
Paid employment	●	

4.1 Key Findings around the Value Chain Vis-À-Vis Potential Impacts

Agriculture value chain analysis for this study revealed that all activities (input supply - production - processing-wholesale - retail - consumption) will be impacted by the project. The project is going to disconnect the existing value chains and displace the actors in the chain. This is because chain actors perform functions that are interdependent on each other. They also undertake joint activities (innovation, policy dialogue) and maintain a chain governance system. It was noted that some livelihood are ethnic and village specific as presented in Tables 6 and 7 respectively. In addition, some activities are gender and age related as outlined below:

i. Hawking (boys and girls)
ii. Fish Smoking(women)

iii. Mat weaving (women)
iv. Pap (eko) leaves (women)
v. Marketing of fish(women)
vi. Vigilante groups(odua people congress)
vii. Non farming activities (youth, men and women)
viii. Farming (men and women)
ix. Livestock (men and women)
x. Sand mining (youth)

Table 6. Livelihoods specific to ethnic groups

Livelihood	Ethnic groups
Cattle	Fulani and coconut farmers who are sometimes indigenes
Marine beach seine(Dogbo)	Ghanaian(foreigners)
Marine pelagic and bottom fishing	Ilaje, Egun and Ijaw
Lagoon fishing	Egun
Creek and swamp fishing	Egun
Farming	Yoruba, Egun, Tenants eg Ibos, Edo etc

Table 7. Livelihoods specific to a village

Livelihood	Village
Hatchery	Hoke daho
Islamic school	Sheik Modawa
Marine beach seine (Dogbo)	Gberefu
Tourism	Gberefu, Agonrin

4.2 Potential Project Impacts on Livelihoods

The project will have great impact on financial, social, human, natural and physical assets as described below:

4.2.1 Financial Asset

The financial resources available in the affected community include income, savings, credit, debt, remittances and pension. The assessment observed that livelihood displacement would affect peoples' financial capital thus leading to loss of job and higher transport cost among the challenges. The findings of this study also identified that renting out houses is a means of income for some of residents in the community. This is because Badagry is in the outskirt of Lagos State and houses are affordable to lower income people in the area.

4.2.2 Social Asset

Social assets have implications for sustainable livelihood [13]. Social network was seen to enhance transfer of information, material goods and services in the affected communities. Observation in some communities shows there is the possibility of social disintegration as a result of physical and economic displacement. Specifically, conflicts among households when discussing the project impacts was observed which may likely damage the social networks. It was observed that the communities have long established social asset that used to help them out at a time of hardship. They lived for many years to understand attitudes of neighbour and community members and this has helped them to know each other well and develop culture of reciprocity, support and trust which manifested in child care, looking after homes when they are away, information exchange, borrowing money, borrowing foodstuff etc.

4.2.3 Human Asset

Human asset has both quantitative and qualitative dimension. The former refer to the number of household members and time available to engage in income-earning activities, whereas the later refer to the skills, education, ability to work and health status and physical capital of household member important for the successful pursuit of livelihood [13]. Focus group discussion (FGD) revealed that farm labour is a major livelihood means for unskilled youth. Livelihood displacement will lead to a situation of decline of the number of those household members who were involved in income-earning activity due to new resettlement site that may not be suitable to carry out informal activities and high transport cost to get the former location work place. Time available to take part in income earning activity for households will therefore reduced. However, the number of labour force in household may increase following relocation. This may include people who may have interest in another income-earning activities, such as guard and driver. Also, children either after school hours or by dropping out of school are engaged in income-earning activity to support households' livelihood.

4.2.4 Natural Asset

The project will greatly impact on the natural asset of the communities. This is because most livelihood activities are water and land based which constitute part of the natural asset. Other natural assess to be impacted upon includes natural resource stocks such as soil, air and genetic resources; and environmental services such as hydrological cycle, pollution sinks from which resource flows and services useful for livelihoods are derived.

4.2.5 Physical Asset

Physical asset comprises basic infrastructure and productive goods used in supporting livelihoods such as shops/kiosks, boats, canoes, hooks, nets, buildings, pen houses, farm inputs, affordable transport, secured

shelter and adequate water supply and sanitation, clean and affordable energy and access to information and communication systems. It is pertinent to note that, lower income people rents apartment in the communities. Hence, displacement most especially to places not accessible to main roads could make tenants not to follow the displaced community. The implication therefore, will mean landlords will lose income in this area. Alternatively, one may conclude the project will bring about development in the area. However, development would mean standard accommodations will be given out for rent which the indigenous landlords may not be able to afford.

4.3 Analysis of Current Resettlement Sites

There are five resettlement sites for all the affected communities. These sites have proximity to other neighboring communities which will help to rebuild social market, and financial institutions in the resettlement site. Physical inspection to the sites revealed the possibility of restoring land based livelihoods. However, Gberefu is the only site out of the five sites that has the possibility of restoring capture fishing livelihoods. The study of their value chain in the table below shows the various stakeholders directly or indirectly involved in the chains in the study areas.

Table 8. Value chain classification in the communities

S/n	Category of actors	Description
1.	Main Chain Actors	**Producers** (farmers/fisher folks) **Processors** (small-scale, large-scale) **Traders** (wholesalers, retailers,) **Consumers** (small-scale consumers, industrial consumers)
2.	Chain Supporters	**Finance institutions (**Micro Finance Institutions, Cooperatives, Farmers Association, BOA**)** **Research institutes (**IITA, RTEP**)** **NGOs (** LAPO**)** **Input Suppliers, Haulage services, Extension services from Ministry of Agric/ ADA**
3.	Chain Context.	Government policies, Advocacy, International trade policies

4.3.1 System Efficiency of Cassava Value Chain in the Communities

There are no ready markets for cassava produced by farmers as they have to scout for market although they supply the garri processing unit. The processors on the other hand have a market for their products as they have traders (retailers and wholesalers) who patronize them, buy the processed garri and distribute to peri- urban and urban markets in Lagos. Kraku, Apran and Ajongun are some form of cassava cakes the communities' values as they eat along with pap. The system is not totally efficient as not all products are effectively utilized e.g cassava leaves and peels are left to rot, while a lesser proportion is fed to farm animals. Price fluctuation in the market also plays a huge role in marketing of cassava products, as high handling and transportation costs affect the profitability of the enterprise.

Table 9. Cassava value chain

S/N	Actors	Products
1	**Producers** (farmers)	Stem Cuttings, Cassava Tubers, Cassava Leaves
2	**Processors**	Garri, starch, cassava flour, cassava peels, kraku, apran, ajongun
3	**Traders**	Marketing of product

4.3.2 System Efficiency of Coconut Value Chain in the Communities

There are ready made markets (retailers and wholesalers) for coconut produced by farmers as they often supply lesser quantities to market demand. The trunk and leaves are used for brooms, furniture and fencing. However, the system is not efficient for the value added product most especially the oil. They lack the capacity in terms of expertise and equipment to process the oil. What obtains presently in the communities are the crude form of extraction been process into 'adin-agbon'. The system is not totally efficient as not all products are effectively utilized e.g water coming from coconut can be well packaged and serve as refreshing drink.

Table 10. Coconut value chain

S/N	Actors	Products
1	**Producers** (farmers)	Kernel, coconut water as a refreshing drink, husk, hard shell, leaves and trunk
2	**Processors**	copra, oil, cake, milk, brooms
3	**Traders**	Marketing of product

4.3.3 System Efficiency of Capture Fisheries Value Chain in the Communities

There are ready made markets (retailers and wholesalers) for Capture fish eries and aquaculture. In most cases, traders and consumers pay money ahead before the fish is catch. Most customers prefer the fish fresh but as a result of inefficient electricity supply, women process it inform of smoking, frying and drying. The system is not totally efficient as this fish are not smoked and dried to standard required most especially for international trade.

Table 11. Capture fisheries value chain

S/N	Actors	Products
1	**Producers** (farmers)	Tilapia, shark,
2	**Processors**	Salting, frying, smoking, drying, storage
3	**Traders**	Marketing of product

Relationships exist between different actors within the chain (e.g. between producers and traders) and within the same process step (e.g. farmer to farmer and fisher folk to fisher folk). The fish and cassava value chains observed in the cause of the field practicum, revealed that there wereSpot market relations between the traders, producers (farmers) and processors, as buyer(traders) and seller (farmers and processors) meet, come to an agreement (or not) and break up the relationship**.** APersistent network relationship was also observed as processors in the cassava processing cluster, and other actors have a preference for transacting with each other time and time again as higher level of trust and some level of interdependence has been established between the actors, although there are no formal contracts between actors. Horizontal integration also exists along the chain as the producers and processors have gone into cooperation, hence both actors share the same (legal) ownership. One and the same organisation deals with different processes throughout the value chains. There is a high level of commitment between the producers and processors along the chains.

The value chains for fish and cassava products describe the flow of produce from harvest to market. Each step in a value chains may be associated with different actors and additional activities through which different fish and cassava products and, added value, is generated. The project impact on fish and cassava products may inadvertently have impacts on the value chain and the actors therein. The nature of the value chains is situation specific; fish processing may occur as a matter of necessity or of choice. While recognizing that for certain fish species the intended (marketable) product is dried fish, in many areas the lack of markets, services (i.e., cold storage, transportation) and utilities (electricity) requires the use of smoking, drying and salting to allow for storage and sale of fish harvests at a later date at more distant fish markets. Markets for fresh and processed fish in the communities includemiddlemen (often local village traders and wives of fisher folks who provide credit, inputs and have cold storage facilities); community fish marketing cooperatives, local fish markets; and established clients, including traders and end users (e.g., restaurants).

4.4 Earning from Capture Fishing in the Affected Communities

The summary of amounts earned daily from capture fishing in the affected communities is presented in Table 12. The figures captured in the table were provided by the communities during the Focus Group Discussion. Some appeared to have been inflated but a mean value as calculated and provided could be a better refection of the reality and be applicable in the absence of further field work to verify the claims. Beach seine was observed to be done exclusively by Ghanaians in Yovoyan and Gberefu communities and it involves adult males, women and youths.

Table 12. Summary of earning from capture fishing in the affected communities

Communities	Income for dragger in beach seine(N)	Income for setter in beach seine(N)	Income for owner in seine net	Income for crew in a medium boat(N)	Income for medium boat owner	Income for crew in a small boat(N)	Income for small boat owner(N)	Lagoon fishing crew)	Owner	Creek fishing(crew)	Owner
Gberefu	2,000	2600	**100,000**	**N/A**	**N/A**	**N/A**	**N/A**	**2,500**	**12,500**	**6,000**	**6,000**
Yovoyan	2,000	2,600	100,000	8,333	33,333	12,333	23,333	N/A	N/A	N/A	N/A
Ganyinbo Sea Beach	2,000	2.6	100,000	11,666	58,300	11,110	33,333	7,777	23,333	10,000	20,000
Gbaji – Yeke – Tome	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1000	3,000
Kujinada	2,000	2,600	100,000	11,666	58,300	11,110	33,333	7,777	23,333	10,000	20,000
Agonrin	2736	3621	136,792	5,000	20,000	3,333	10,000	N/A	N/A	2,166	4,333
Agonvi Town	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3750	7500
Agonvi Sea Beach	4,000	8,333	**100,000**	**3,444**	**10,333**	**1000**	**3,000**	**N/A**	**N/A**	**7,500**	**15,000**
Ganyinbo Town	N/A	N/A	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**5,000**	**20,000**
Hoke Daho	N/A	N/A	N/A	12,500	37,000	N/A	N/A	3750	7,500	1000	2000
Total	14,736	19,757	636,792	52,609	217,266	38,886	102,999	21,804	66,666	46,416	97,833
Mean	**1,228**	**1,646**	**53,066**	**4,384**	**18,106**	**3,241**	**8,583**	**1,817**	**5,556**	**3,868**	**8,153**
Range	**2,000**	4,733	36,792	9,056	47,967	7,777	30,333	4,027	15,833	9,000	18,000

N/A means not applicable

4.4.1 Women Role in Capture Fishing

The women do the marketing just like any other fishing communities in Nigeria. The fish is usually bought from the husband in cash when there is scarcity but when fish is in excess the women are allowed to buy and pay after sales. The cost price is N500/kg and the women sell to their customers at N750/Kg at the landing site. When in large quantity, the excess is smoked. Table 13 showed what marine fish smoker needed to smoke a 40 kg fish.

Table 13. A typical requirement of a marine fish smoker

Item	Cost(N)	Quantity
Drum	3,000	1
Wire gauze	3,000	2
Wood	3,000	Bulk
Fresh fish	20,000	40kg
Sales	3,000/kg	10kg

5. Recommendations for Resettlement Site Selection Process

The primary means of livelihood in Badagry is agriculture and the communities over the years have been involved in various agricultural enterprises which are either land or water based. Thus, resettlement site selection should consider the various livelihood activities surveyed in the livelihood analysis table in close collaboration with affected communities.

Tree crops such as coconut, palm tree, raffia palm, mango, citrus, cashew, pawpaw, bread fruit and guava constitute major means of livelihood in this area. These crops take a minimum of 3 to 7 years to be raised to fruiting stage. It is therefore recommended that tree crops should be the first set of livelihoods to be restored afterdialogue with the affected communities. This will require high level of interaction with the affected people, in order to develop the most feasible mitigation measures. The agreed mitigation measures, being a form of compensation, will be incorporated into formal collective and/or individual agreements. To the extent possible, the agreed mitigation measures will be described and quantified in these agreements, so the affected people may evaluate what they are getting as compared to what they are giving up.

The goal is that no person will suffer an economic loss due to the project. Thus, mitigation measures will be planned to take account of each individual situation, and not aggregate measures of economic benefits. Individuals within an affected household, for example men, women, youth, boys, girls, aged, will be considered to have equal entitlement to any livelihood restoration measures in as must should be much that they are involved in the livelihood process.

The assumption is that every livelihood actors will benefit and pass through a period of transition before their livelihoods can be restored and improved upon. However, since the affected communities cannot kick start their livelihood activities immediately in the resettlement site; the plan below gives details of transitional activities to be implemented (Appendix A).

A livelihood transitional program is the process of protecting and promoting the livelihoods of affected communities recovering from displacement [14].The objective of the transitional programme is to, provide cash grant and short-term income transfers as a safety measure for the community to help them commence the process of livelihood restoration. There ought to be rebuilding of households, community assets and local institutions.

Livelihood Transition programs are put in place to cushion the effect of the displacement or deprivation of land or any other means of livelihood prior to restoration. In relation to capture fishing payment of daily income should be made to the people below: fishermen, youths, wives who are the marketers, Boat owners. This should take place from the time the boat owner starts moving with his household to the time he is able to return from the first fishing voyage. The cost of moving the household and assets could equally be defrayed.

As for aquaculture,the following are suggested: the salary of workers should be paid, the income of the owner from the farm until the ponds are fully constructed and the first harvest is done.

As for cassava processors (Garri) women are used to buy cassava tubers from their husband and kinsmen in their communities. Displacement would mean they cannot buy cassava tubers from their husband during the period of transition. Thus, alternative would mean buying from outside the community. Therefore, transport allowance would be paid to such processors for the extra distance they will have to cover during the period of transition for cassava producers.

For land based livelihoods, the market value of land of equal productive use or potential land located in the vicinity of the affected land, plus the cost of preparation to levels similar to/or better than those of the affected land, plus the cost of any registration and transfer taxes should be paid as compensation apart from transition allowances. It is noteworthy to divulge that a major challenge encounter during the field work was a glaring lack of skill in the farmers and fishermen including fish farmer who require training in all aspects of fishing and fish farming.

Thus, the followings are recommended:

i. The starting point of the restoration program should be delivery of relevant skill through training in all aspects of land based livelihoods and fishing.

ii. With the construction of a sea port, new opportunities will come up and the youth should be trained in readiness for absorption into the workforce.

iii. Replacement of fish ponds and hatcheries in the new location as well as improved agronomic practices for farming.

iv.Distribution of improved seeds and production of inputs to speed up crop growth

v.Restocking and rebuilding livestock and pen house.

Some other key suggested activities to be executed during the transition, restoration and improvement programs for the affected communities were highlighted in Appendix B while Appendix C proffer recommendations on major activities that can facilitate prompt restoration of the communities'livelihood after displacement

6. Conclusions

This study highly recognized the significance of establishing sea port within the study area, as port development has strong backward and forward linkages to the coastal communities and the national economy at large. In like manner, sustainability of the livelihood of the people, most especially the fishermen and aquaculturist in these communities are very important. Therefore, the study has provided baseline information for government or policy maker to work on before the commencement of this laudable project.

Conflict of Interest

We declare that there are no competing interests.

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Appendix A. Livelihood Transition Program

Livelihood activity	**Gestation period**	**Size**		**Investment cost ₦**	**Income ₦**	**Profit ₦**
		Minimum holding	Maximum holding			
Cassava	9-12 months	1 plot	2ha	149,500/ha	180,000/ha	30,500/ha
Cassava processing	1 week	1pickup load	2 ton	78,800/tonne	90,000/tonnee	11,200/tonnne
Tomato	3 months	1 plot	2ha	270,000/acre	1,080,000/acre	810,000/acre
Coconut	7 years	3 plots	4 ha	1,001,000/acre	1,920,000/acre	919,000/acre/yr
Maize	3 months	1 plot	2 ha	42, 650/ha	73, 500/ha	30,850/ha
Marine fishing 1.beach seine 2.set net 3.pair trawling	1 week	 1 1 2	 1 65 22	 5,524,000 865,000 1,205,000	 5,000,000 150,000x2/day 105,000/day	

Footnote:

- The gestation period is the period under which the beneficiary will be entitled to transition allowance
- The profit is the allowance he will be entitled to during the period of transition
- Anybody taking cash compensation and is not willing to restore his/her livelihood will not benefit from the transition program

Appendix B. Suggested activities During Transition, Restoration and Improvement Programs

Activities
Transportation of people and assets in the affected communities to the resettlement site
Payment of allowance during transition period
Allocation of farm plots for crops, livestock and aquaculture to displaced households in the resettlement site
restoration of market access, financial services and transportation system
rehabilitation of institutional capacity, including local non-governmental and community-based organizations, and the local government
psychosocial counseling for households in the resettlement site
leadership training and civic education

Appendix C. Livelihood restoration activities

Livelihood restoration activity	**What impact will it address**	**Who will benefit**	**Specific activities**
Establishment of community based enterprises (CBE) through the creation of food processing centers and training	-Sand mining by youth -restricted fish smoking activities of women	-Youth -Women	-Acquisition of food processing machines such as bakery, cassava processing factory, oil mill -skill acquisition in specific trades such as catering, carpentry, fashion design, Masonry, computer training, hair dressing and welding/pipe fittings.
Establishment of a Fishing Terminal	Restricted capture fishing in the resettlement site. -restricted fish smoking activities of women	-Fisher folks -Youth -Women	-Berthing -Fuel dump -Fish processing plant -Cold storage facilities -Marketing& distribution -Boat building and repair -Net making and repair
Aggressive aquaculture development and distribution of fish fingerlings to farmers	Restricted capture fishing in the resettlement site. -restricted fish smoking activities of women Loss of income for people doing aquaculture because they cannot stock new fingerlings again	-Fisher folks -Youth -Women	-Earthen ponds construction with fingerlings and feeds -Concrete ponds construction with fingerlings and feeds -Fish cages with fingerlings and feeds -Training on feeds formulation
Introduction of light mechanization program to reduce drudgery and entice youth to agriculture	Sand mining practices of youth Inaccessibility to proportional farm land taken by the project	-Youth -Farmers	Acquisition of community based tractors, planters and harvesters

Introduction of new land management practices based on soil testing and analysis and introduction of technical innovations	Inaccessibility to proportional farm land taken by the project	-Farmers	-soil test and analysis to identify specific crops for specific communities -Dissemination of appropriate technologies to farmers -Creation of cooperatives and associations to ensure the technical innovations are received, applied, managed and promoted in the best possible ways by the target farmers
Rapid multiplication and distribution of improved high yielding seed varieties of principal food crops that are resistant to pest and disease adapted to local climate and environment introduced by research institutions	Inaccessibility to proportional farm land taken by the project	Farmers	12,000 bundles of improved cassava (CMD resistant) varieties 1000kg of high quality protein seeds 12,000 coconut suckers 12 various indigenous fruit trees
Harnessing the appropriate value chains and endowment of cooperative cottage enterprises with suitable agro-processing equipment for product transformation, value addition and market linkages	More time and money spent by women to access markets Restricted fish smoking activities of women Inaccessibility to proportional farm land taken by the project Sand mining practices of youth More time spent by money to buy leaves (ifin) used for making mart until the first harvest in the resettlement site More time and money spent by processors (women) in buying farm produce (cassava, maize etc.) for processing from the market in place of buying from the communities.	-Women -Youth -Farmers -Livestock farmers -Fisher folks	Value chain mapping for key agricultural commodities (coconut, cassava, vegetables and fisheries) Market mapping Acquisition of processing machines Establishment of agro processing industries
Information transmission on correct utilization of agricultural products, good nutrition and hygiene practices	high mortality rate for livestock because of adaptability to new environment	Livestock farmers	Veterinary services for livestock and distribution of parent stocks
Establishment of community based micro-credit scheme	Loss of income for people hawking in the displaced site More time and resources spent by the affected communities in rebuilding trust and social integrations in the resettlement site Lose of financial capital by traders and farmers pending the time they are able to rebuild their trust and social integrations in the resettlement site	Traders Women Youth Farmers Fisher folks Artisans	-Formation of groups and cooperatives -Introduction of community based seed fund system
Establishing tourist attraction centers	Gberefu community will lose patronage on their tourist center (slave trade point of no return) Agonrin will lose patronage on their tourist center (southern beach).	Gberefu Agonrin	Replication of slave trade point of no return Replication of southern beach