

Developing A Sustainable Eco-Fishing Village in Riverine Nigeria: A Review of Iworkiri Fishing Village Bonny Island.

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Abstract.

Iworkiri is situated a few kilometers outside Bonny main town on the edge of the Atlantic Ocean. Fishing has been the most important activity around the Iworkiri coastal area for centuries and forms the biggest part of the Islands historical identity. Since fishing activities started at Iworkiri informal settlements, the fishing village has been faced with poor housing conditions as a result of the cost of building materials and neglect by the government. Iworkiri fishing village still lacks good public infrastructure, planned spaces for public and other fishing activities. The existing fishermen Cabin which is the core of their everyday life are dilapidated Shacks. All these anomalies can be improved on by designing and constructing an ecological sustainable fishing village, taking advantage of its untapped eco-friendly available building materials. Studies show that eco-friendly building materials have proved to be a prized choice in the modern building construction as we search for sustainable building materials, and more active use of these materials will check the adverse effect of contemporary building materials and construction on our environment. This paper concludes by recommending use of eco-friendly building materials for reconstruction of Iworkiri fishing village. This will basically improve the poor housing condition in the fishing village without adverse effects on human and the environment.

Key words: *Eco-Fishing, Sustainability, Iworkiri Fishing Village, Building Materials, Housing*

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I. Introduction

Fishing and trade have been two of the most important activities around the coastal areas within Iworkiri and other fishing settlements in Bonny for centuries and it is a big part of the Island's historic identity. Fishing village is defined broadly as "a community which is substantially dependent or substantially engaged in the harvesting and processing of fishery resources to meet social and economic needs which includes fishing vessel owners, operators, and crew and fish processors that are based in such community". Most fishing villages are settlements that are gathered along water bodies that contain species of fishery and sea food resources because it is a key source of livelihood and nutrition to humans.

Tropical freshwater small scale artisanal fisheries provide cash income and animal proteins to many people in rural and urban areas of developing countries¹. It has been established that protein from foods of animal's origin is lacking in the diets of Nigerians and most Africans². The supply of meat from games and various domestic animals are not enough to meet the protein demand of the growing population in most African countries³. The importance of fish protein in Nigeria cannot be over emphasized since more than 40% of the animal protein consumed by an average Nigeria comes from fish.

According to ⁴ total demand for fish in Nigeria is expected to increase since the population is increasing. The rapid increase in world population has resulted in a huge increase in demand for animal protein and other nutritional requirements. Human population is increasing at the rate of about 7.5 million per year and the major population increase occurs in the under-developed world, an area that holds about 75% of the world population³. In Nigeria, the current demand for fish food is estimated at a little over 1,000,000 tons per annum as against a supply of about 800,000 tons per annum⁵. There is therefore a great need to improve housing and infrastructural development in Iworkiri fishing village using eco-friendly building materials which is cheaper, available and environmental friendly, since the government has neglected physical development in the fishing village. This will improve the environment and invariable increase number of fishers and quantity of fish supplied in Nigerian market. This will surely compensate for the deficit in fish supply as against² suggestion of massive importation of fish into Nigeria.

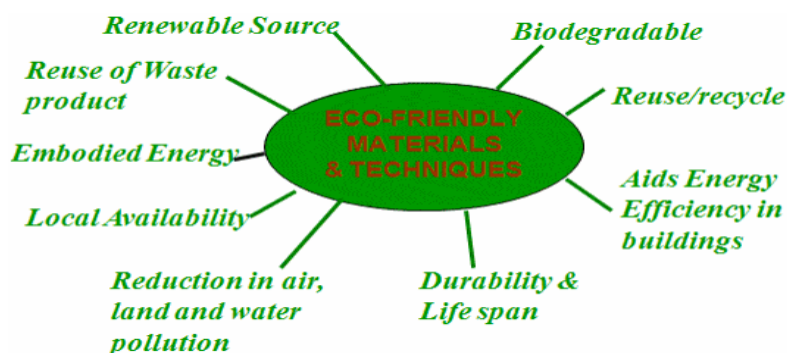


Fig.1. Characteristics of eco-friendly materials.

An eco-friendly building material according to⁶ is one that increases the efficiency of energy used and reduces impact on human well-being and the environment. There are many different materials that can be used that are eco-friendly such as Adobe, Bamboo, Timber etcetera. Some of the characteristics of these eco-friendly building materials include durability, renewability, and affordability. They are also non-toxic building materials which ensure excellent thermal performance with low energy requirement. They are fire resistant, sustainable, cheap, biodegradable, local, abundantly available and easily constructed in any shape, low sound transmission levels through walls and having a low environmental impact. Adobe for instance is one of the widely used construction material in human civilization, though always neglected. Adobe bricks are currently the best choice to build affordable housing that are environmentally responsive.

“Eco-villages today are typically small communities with a tightly-knit social structure united by common ecological, social, or spiritual views. These communities may be urban or rural, high or low technologically, depending on circumstance and conviction. What they share is a deep respect for nature, with humans as an integral part of natural cycles. Eco villages address social, environmental, and economic dimensions of sustainability in an integrated way, with human communities as part of, not apart from, balanced ecologies”⁷

Statement of problem.

Iworkiri Fishing village is faced with poor housing and infrastructural development. Since Iworkiri started as an informal settlement, it lacks good housing, infrastructure, planned spaces for public activities as well as educational facilities, waste management problems and spaces for other fish processing activities. Though fishing is done at large artisanal scale in Iworkiri fishing village; Ladu and Neiland (1997)⁸ argued that it has in time suffered neglect in terms of housing and infrastructural development over the years when compares with other parts of Rivers State. To worsen the situation, the structural condition of the fishermen’s cabin in Iworkiri fishing village, which is the core of their everyday life, is not healthy as a result of poor construction and construction materials. All these anomalies could be improved by taking advantage of its untapped eco-friendly resources to improve and also promote their rich cultural heritage. Improving the settlement by adequately tackling these existing problems will also aid in enhancing the general wellbeing of the inhabitants within the settlement and also give them a sense of belonging along with the outer society.

Aim and objectives.

The aim of this study is to improve housing conditions in Iworkiri fishing village by harnessing its eco-friendly building materials that will enhance living conditions for the locals without having adverse effects on the environment.

II. Study area.

Iworkiri in Igbani language means “people of Kiri”; situated inside Finima. It has a strong Fishing settlement identity, character, activity and cultural heritage. It is an informal settlement, its first settlers were said to be migrants who settled along the Atlantic Ocean edge during the Nigerian Civil war from 1967 to 1970. Overtime these coastline settlement have grown to become home for locals from different ethnic groups in Nigeria and Africa which includes; Andoni, Bonny, Igbo, Yoruba, Okrika, Nembe, Opobo, Ogoni, Ibibio, Okrika, and Cameroon (fieldwork, 2019). Finima Community in Bonny Island lies between 4.3955° N, 7.1763° E; this community which is home to Finima Nature Park is surrounded by fishing settlements and long stretches of beaches by the west and south. These fishing settlements are home to local fishermen and fish mongers from Bonny and other neighboring coastline communities. The beautiful beaches also attract tourist and fun seeking inhabitants alike on sunny days and festive periods like Easter and Christmas.

Bonny Island is located in Rivers state in the Niger Delta of Nigeria near Port Harcourt. The serene community has several historical and economic symbolisms for the Nigerian federation. It was the melting point

of economic activities from the 16th century and also served as the first Christianity's port of call in West Africa. The communities in Bonny Island are subdivided into two segments- the mainland and the hinterland. The mainland comprises the Township, Sandfield, Iwoama, Orosikiri, Aganya, Ayambo, Akiama, Workers camp, Finima and some outlying fishing settlements lying along the Bonny River's coastline. The hinterland includes the villages that serve as the home to bonny kingdom natives.

In the early 1990's, the Federal Government of Nigeria, in collaboration with three international partners, Shell Gas BV, CLEAG Limited (ELF) and AGIP International BV, started the multibillion-dollar project 'Nigeria Liquefied Natural Gas Limited' (Nigeria LNG). Due to the strategic position, the island hosts various companies including the Royal Dutch Shell, Mobil, Chevron, Agip and Elf.

The most important industries in Iworkiri are fishing and small-scale agriculture. The area hosts production of maize, palm oil, and sweet potatoes among other things. Iworkiri location gives the village a great potential for fishing and fishing industry, but as mentioned before it is threatened by the condition of the sea, with problems such as pollution, water hyacinths, and overfishing. You can also find some backyard industries such boat-building. Iworkiri has a population of 373 inhabitants which includes men, women and children. The male make up 161 and Females make up the remaining 212 inhabitants.

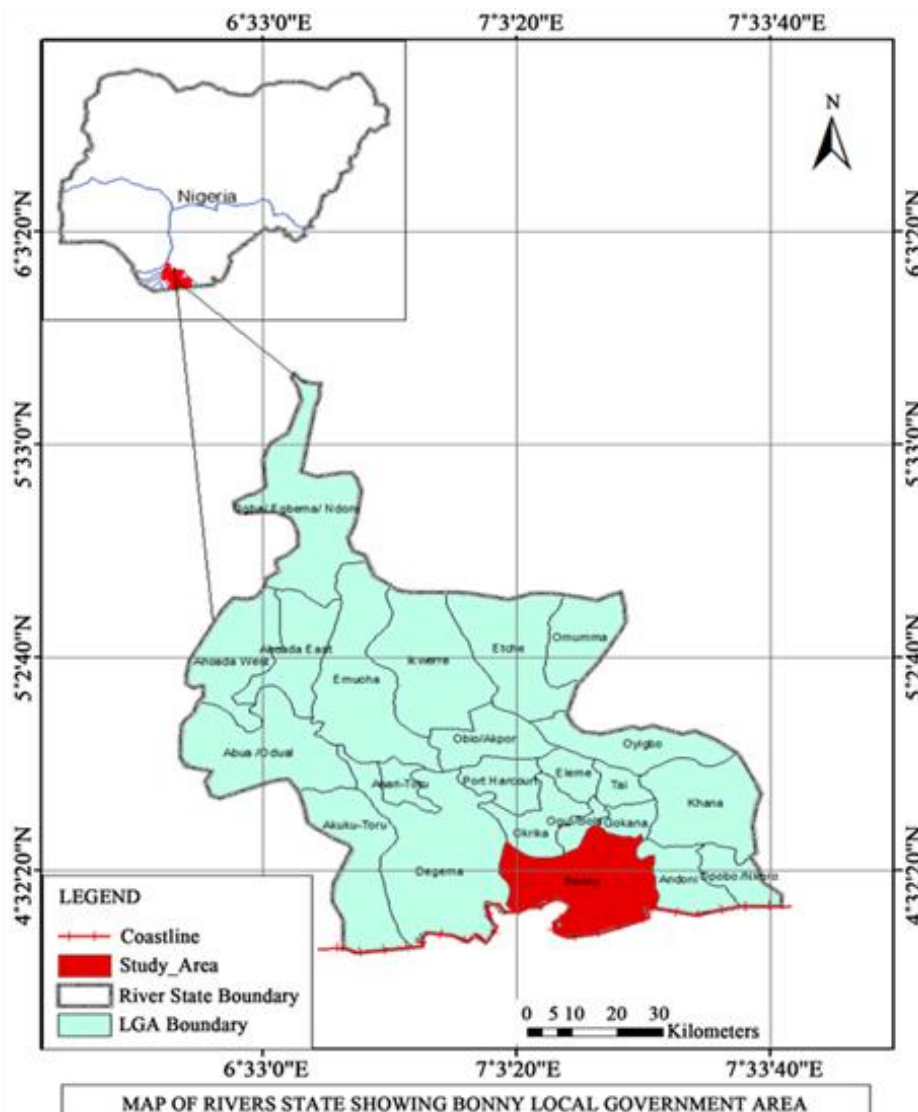


Fig.2. Map of Rivers State showing Bonny LGA.

Source: Google images.

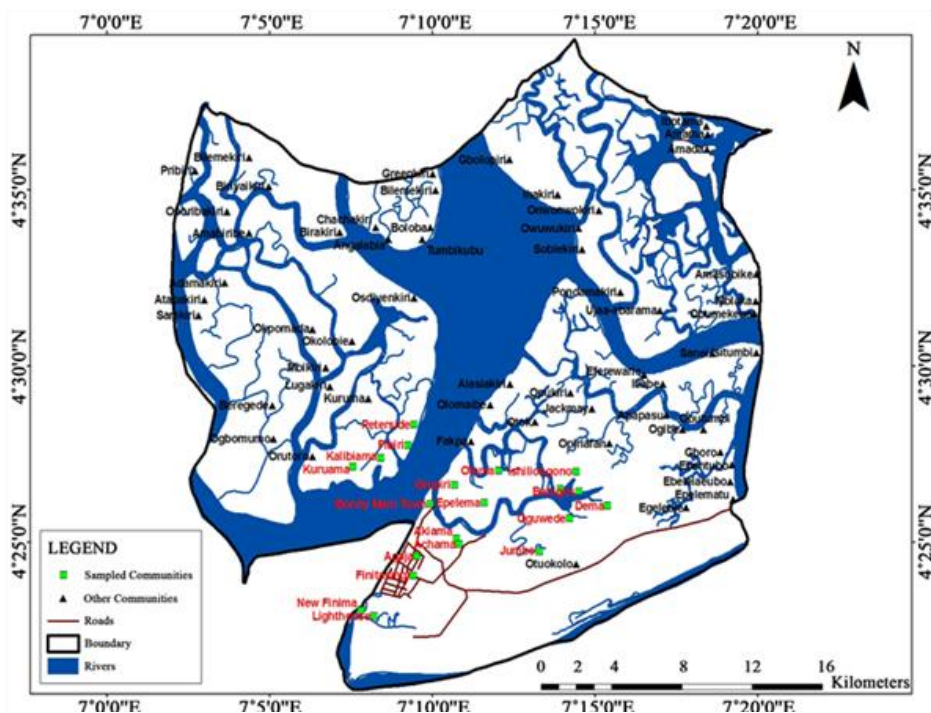


Fig.3. Map of Bonny Island, showing Finima community.
Source: Google images.

III. Data collection

Qualitative data is spoken and written representations of human experiences. Observations, interviews and documents are a few examples of such data⁹. The information gathered is based on the community's Demography, Economy, Housing quality, communal spaces and existing environmental situation among others to have a solid base for analysis and synthesis. Based on the educational level of Iworkiri people the questionnaire method of data collection was not the only method adopted, spontaneous interview and interaction with locals were adopted which helped in providing the needed data. It was a lot easier to conduct an interview with a regular interaction than with the questionnaire. With the questionnaire administration, the interview and interaction with the community chairman and other Iworkiri people carried out in June, 2019; the following data were collected.

IV. Research findings

The data in Table 1 shows population by age distribution in Iworkiri fishing village while data in Table 2 confirms the population of Iworkiri fishing village by sex. From data in Table 3 85.25% of residents of Iworkiri fishing village are fishers. The data confirms that fishing is not left for men alone, women also take fishing as occupation while the remaining few of the residents are farmers and business men and women.

According to Table 5, the need of residents of Iworkiri fishing village is majorly housing, 83.65% while 12.6% of the respondents claimed that their need is electricity.

Table 1: Population distribution by age.

S/N	Range in years	Frequency	Percentage
1	0 - 17	174	46.65
2	18 -65	132	35.39
3	65 and above	67	17.96
	Total	373	100

Source: Author's field work, 2017.

Table 2: Population distribution by gender.

S/N	Gender	Frequency	Percentage
1	Male	181	48.52
2	Female	192	51.48

Total	373	100
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Source: Author's field work, 2017.

Table 3: Occupation of Iworkiri people.

S/N	Occupation	Frequency	Percentage
1	Fishing	318	85.25
2	Commercial Business	36	9.65
3	Others	19	5.10
	Total	373	100

Source: Author's field work, 2017.

Table 4: Sources of light in Iworkiri.

S/N	Source	Frequency	Percentage
1	Generator	12	3.22
2	Lantern	166	44.50
3	Local candle	195	52.28
	Total	373	100

Source: Author's field work, 2017.

Table 5: Needs of Iworkiri residence.

S/N	Source	Frequency	Percentage
1	Housing	312	83.65
2	Electricity	47	12.60
3	Education	3	0.80
4	Roads	11	2.95
	Total	373	100

Source: Author's field work, 2017



Residential building condition





Condition of the fishermen Cabin



Building materials used in Iworkiri



Fishing activities in Iworkiri

V. Summary of findings.

Analysis of findings was based on the STRENGTH, WEAKNESS, OPPORTUNITIES and THREATS (SWOT) that Iworkiri fishing village is facing, drawn from their characteristics, documentation of the fishing village, interviews and literatures.

Strengths.

- ✓ Iworkiri have a fishing village identity, character and cultural heritage.
- ✓ It is located at the edge of the Atlantic Ocean, thereby making it home to diverse species of fish and a key source of livelihood.

- ✓ Vast presence of greenery, sand and wetlands, making it an ideal location for recreational activities and source for aboriginal materials.
- ✓ Its economic activities is thriving and sustainable.
- ✓ Presence of diverse resources such as renewable, cycling and non-renewable resources.

Weakness.

- ✓ Poor housing condition for the locals, fish storage and preservation.
- ✓ Poor structure of sewage management and waste management in the school and houses of the locals leading to unclean environment.
- ✓ Unsustainable use of energy, water and waste. No means of recycling or reuse available.
- ✓ Lack of public spaces for communal activities and enlightenment programmes.
- ✓ No jetty/pier for boats to be anchored to.
- ✓ Lack of portable water for general usage.
- ✓ No fish market or properly planned space for fish mongers.
- ✓ No alternative means of preserving products other than fish smoking which is done with wood thereby emitting harmful substances and depletion of natural resources.
- ✓ Poor drainage of storm water thereby leading to poor runoff and presence of stagnant water.
- ✓ No alternative employment services apart from fishing.
- ✓ Poor access routes to the settlement

Opportunities.

- ✓ Availability of eco-friendly building materials for construction of new houses and retrofitting of existing houses.
- ✓ Potential to make use of renewable resources such as hydro, solar, wind, & biogas to generate energy for future activities.
- ✓ Its existing fishing activities can be developed to meet a sustainable communities requirements that is eco-friendly and economically thriving.
- ✓ Introduction of a fish processing plant can improve on its employment opportunities and can also serve as a market for the fishermen.
- ✓ Potential for Ecotourism development because of its location and other surrounding nature reserve activities like the Finima Nature Park.

Threats.

- ✓ Environmental degradation due to illegal mining of crude and unsustainable waste and sewage management.
- ✓ Increasing population in Iworkiri due to migration and inclining birthrate.
- ✓ Water pollution may lead to health risks such as epidemic outbreaks.
- ✓ Climate change leads to increased risk in flooding, higher temperature, loss of biodiversity and fishery resources.
- ✓ Security of the locals is at risk due to the activities of militants and sea pirates.

VI. Conclusion.

From the documentation of Iworkiri Fishing Village, interview and interaction with the locals, evidence abounds that there is poor housing condition and other supporting facilities in the fishing village as a result of neglect by the government and the cost of imported building materials which the locals could not afford because of their meager income from their fishing activities. They have only resorted to whatever they could lay their hands on for housing construction which poses a grave threat to their lives. There is therefore need for improvement of the housing condition of Iworkiri fishing village to help upgrade the living standard, improve fish storage and preservation facilities to grow their income and also meet with the fish demand of the society.

VII. Recommendation

Over the last few decades the interest in sustainable development and intentional communities, whether they are Eco villages, cohousing, or other kinds of communities related to sustainability, has grown rapidly¹⁰. It seems like a very significant shift in consciousness has occurred across the globe and society has become aware of environmental problems which can no longer be ignored and something has to be done¹¹. Some changes can already be noticed: governments issue new laws, restricting destructive production, companies are improving their products and ways of manufacturing to be more environmentally friendly. On top of that, citizens are slowly changing their daily habits to live in harmony with nature.

The paper therefore recommends the use of eco-friendly building materials such as Aboke, Bamboo, Timber etcetera which is available in abundance in the study area and cheap at the same time for the

construction of houses for the locals, construction of toilet facilities, construction of the fisherman cabin and construction of the storage and preservation facilities.

The paper also call on the Government and NGO's to answer the clarion call of the locals to improve their housing condition and environment to enhance their activities which supplies the societal need. If the recommendations of this paper is applied it will improve the Iworkiri fishing village and their activities, improve the fish supply and improve the economy of the locals and the states internally generated revenue.

References

- [1]. Petre JM (1996) Fisheries in Large Tropical Reservoirs in South America. *Resources Management Journal* 2: 111-133.
- [2]. Idodo-Umeh G (2003) *Freshwater Fishes of Nigeria (Taxonomy, Ecological Notes, Diets and Utilization)*. Idodo-UmehPubl Ltd Benin City, Nigeria.
- [3]. Federal Department of Fisheries (2003) Presentation on the Fisheries sub – sector at the Presidential Forum Lagos. *Fisheries Society of Nigeria* 34-56.
- [4]. Olaniyan R. F (2015). Fishing Methods and their Implications for a Sustainable Environment. *Fish Aquac J* 6: 139. doi:10.4172/21503508.1000139
- [5]. Soyinka OO, Kassem AO (2008) Seasonal variation in the distribution: Fish Species Diversity of a tropical Lagoon in South-West Nigeria. *Journal of Fisheries and Aquatic Science* 3: 375-383.
- [6]. Benghida, D (2015). Adobe Bricks: The Best Eco-Friendly Building Material. *Advanced Materials Research* Vol. 1105, 386-390.
- [7]. Bates, A. (2003). *Ecovillage Roots (and Branches)*. *Ecovillages – What Have We Learned?* 117, Retrieved March 8, 2009 from the World Wide Web: <http://gen.ecovillage.org/iservices/publications/articles/CM117RootsandBranches.pdf>.
- [8]. Ladu BMB, Neiland A (1997) A review of fisheries policy in Nigeria since 1950 (With Special reference to inland fisheries of North Eastern Nigeria. *Center for Economics and Management of Aquatic Resources paper* 126: 34.
- [9]. Punch, K. (1998). *Introduction to Social Research – Quantitative & Qualitative Approaches*, 174 – 197. Great Britain: Sage Publications
- [10]. Christian, D. L. (2003). *Creating a Life Together – Practical Tools to Grow Ecovillages and*
- [11]. Jackson, H. (1998). *What is an Ecovillage?* Retrieved March 9, 2009 from the World Wide Web: <http://www.ross-jackson.com/rj/21987/>.

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