



# COPING WITH CLIMATE CHANGE AS A CAUSE OF CONFLICT IN COASTAL COMMUNITIES OF WEST AFRICA

*(Climate Change, Insecurity,  
and Conflict in the Niger Delta)*

A Research Report by Health of Mother Earth Foundation



Funded by the European Union

Coping with Climate Change as a Cause of Conflict in Coastal Areas of West Africa  
project

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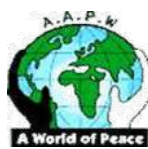
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## Abbreviations

AAPW:	Academic Associates PeaceWorks
AfDB:	African Development Bank
CEJ-Togo:	Centre for Environmental Justice-Togo
CRADESC:	Centre de Recherche et d'Action sur les Droits Economiques Sociaux et Culturels
FAIMM:	Fondazione Accademia Italiana della Marina Mercantile
HOMEF:	Health of Mother Earth Foundation
ASIPTO:	Association des Sinistres de Phosphates du Togo
INDC:	Intended Nationally Determined Contributions
IPCC:	Intergovernmental Panel on Climate Change
RGPH:	National Census of Population and Habitat
WACA:	West Africa Coastal Areas Management Program
WANEP:	West Africa Network for Peacebuilding

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## Executive Summary

This report examined the link between climate change, insecurity, and conflict. It is based on a study undertaken in five states in the Niger Delta,<sup>1</sup> two communities in Togo,<sup>2</sup> and two in Senegal, as part of the Coping with Climate Change as a Cause of Conflict in Coastal Areas of West Africa (C-7 West Africa) project, being implemented by four organisations<sup>3</sup> with funding from the European Union.

Despite growing notion that climate change is a cause of conflict, among governmental leaders, researchers, policymakers, and civil society groups especially in multilateral and intergovernmental climate policy circles, there is very limited research on the subject, and a lack of consensus. The purpose of the research was to explore the link between climate change, insecurity, and conflict, with focus on the Niger Delta.

Coastal communities in the Niger Delta, Togo and Senegal are faced with cross-cutting climate change issues that include floods, erosion, unpredictable rainfall patterns and excessive heat. Experts, with the help of satellite radar and other tools, have argued with data, for example, that sea-level rise, due to increased water temperatures in the Niger Delta has been steady since the 20th century.<sup>4</sup> In the Bonny and Okrika axis of Rivers State, the sea rose by 7.5 cm (3.0 in) between 1993 and 2017. Likewise, it rose by 16–21 cm (6.3–8.3 in) between 1900 and 2016.<sup>5</sup> Frequent floods are part of the results. These problems continue to affect humans in diverse ways. The impact on livelihoods, poverty, environmental degradation, displacement of people, desecration of cultural heritage, and outright loss of traditional communities, have been established and reiterated. In the Niger Delta alone, an estimated 1m rise in sea level by 2100 is capable of engulfing 18,000 square kilometres of Nigeria's coastline (about 26% of the Niger Delta).

The study notes the significance of local knowledge of climate change as well as its adaptation and coping mechanisms and highlights the fact that this has been discounted in much of the existing empirical knowledge and methods for knowing. Kono is a good case, where people have created an area protected from fishing activities. The idea is based on local knowledge of adaptation and mitigation, something that can be replicated in other communities.

The study applied participatory research principles and combined extensive desk review, focus group discussions, observation, and interviews, with the help of ATLAS.ti for the content analysis of vast qualitative data collected from the field. Participants included fisherfolks, farmers, community leaders, youths, civil servants, representatives of state ministries of environment and their Climate Change units, and local government. Overall, the approach in terms of methodology was based on the goal of the Coping with climate change as a cause of conflict in coastal areas project. Under this project, the consortium has 'response to the coping needs of people in coastal areas with relevant tools' as a critical element. This requires solution-oriented approaches and the combining of data from secondary sources and a field work that permits exploring participants' practical experiences with climate change.

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1 Akwa Ibom, Bayelsa, Delta, Cross River, and Rivers.

2 Doeivi Kope and Kpeme,

3 Health of Mother Earth Foundation, Fondazione Istituto Tecnico Superiore Sostenibile nei Settori Trasporti Marittimi e della Pesca-Accademia Italiana della Marina Mercantile (FAIMM), Academic Associates PeaceWorks, and West Africa Network for Peacebuilding.

4 Agu, C.C. and Ibrahim, A. (n/d) An Assessment and Mapping of Coastal Flooding in Niger-Delta; a case study of Bonny, Okrika and Ogu/Bolo of Rivers State, Research and Development Agency. DOI: <https://doi.org/10.21203/rs.3.rs-88119/v1> (accessed 22 June 2022).

5 Ibid.

Climate change creates social, economic, and environmental conditions that indirectly result in conflict, mostly at family and community levels. The elements of these conditions include- growing food insecurity, displacement of people, declining fish catch, poor agricultural yield, and poverty. Adapting livelihoods to the effects of climate change is a key point to note in relation to struggle for scarce resources, search for alternative means of livelihood and criminal violence.

Notably, the oil and gas industry represent a severe and incomparable challenge. The burden on the environment and its environmental insecurity component has far-reaching impacts that sometimes make distinctions between climate-driven and oil and gas-driven socio-economic and environmental issues difficult to conceptualize among participants. The industry is scientifically and globally acknowledged to be a major contributor of greenhouse gases into the atmosphere. These gases are responsible for the changing climate. Conceptually, many participants did not see this link beyond the fact that the industry has continued to pollute rivers, creeks, soil, and air, with devastating impacts on people, ecosystem services and livelihoods. This explains the violent oil conflicts that featured in the Niger Delta, including the hanging of Ken Saro-Wiwa and nine others in the leadership of the Movement for the Survival of Ogoni People (MOSOP). The group's intense struggle for environmental justice under the leadership of Saro-Wiwa was met with state aggression and violence under the late General Sani Abacha administration. His hanging was followed by series of violent campaigns by militants who demanded for development of their communities with oil money derived from the region and asked for protection of their environment from oil spills and gas flaring.

To halt violent attacks on oil facilities, government security and hostage-taking of oil workers, and restore daily volume of oil produced in the country, the Federal Government of Nigeria came up with an amnesty programme. The violence caused drastic reduction in the production of oil, from two to about one million barrels per day. Through the amnesty programme, militants, referred to as ex-militants today, receive monthly stipends, scholarships, and vocational training, after surrendering their guns to the government. Meanwhile, as militants, they did not include climate change as part of their grievances nor in the framing of development of the region.

Climate change, experientially understood by participants, and measured as coastal erosion, floods, sea-level rise, increased temperatures (simply defined as excess heat or hot weather conditions), thunderstorms, and unpredictable rainfall patterns, has implications for the wellbeing of people. Fishers and farmers are increasingly becoming unable to earn legitimate and sufficient income to take care of family. They are also failing in the area of producing enough food for households with floods frequently overrunning farmlands and leaving farmers with the option of harvesting crops before maturity. The fact that fisheries resources are shrinking in these communities means fishers would be making decisions about alternative sources of income. Participants, however, blamed the situation on overfishing, destruction of mangroves and oil pollution.

The increasing loss of vast agricultural land due to coastal erosion and sea encroachment are serious concerns within the broader issues of livelihoods. This was highlighted by participants in relation to poverty, unemployment, massive oil pollution and criminality as critical elements of the discourse. For them, climate change is even more than a threat to their economic well-being. This is because the communities have historically and culturally relied on fishing and farming for survival and would see the distortions in these occupations resulting from climate change as touching the heart of their existence. Still, within the existential threat of depleting land resources, some move inland to settle on land provided by family or community. While many have stayed back in difficult conditions, others have outrightly migrated to urban areas in search of jobs and business opportunities as part of coping strategy.

For most participants, the search for alternative sources of income in response to social, economic, and environmental conditions created by climate events is a rational behaviour. But some of the decisions people make are illegitimate and criminal, with outcomes including further environmental problems and threat to community peace. For example, young people who previously formed most of the fishing population, having faced the problem of the increasing failure of the occupation to provide sufficient income and food for their families, are at the forefront of criminal and illegal economic activities. Piracy and illegal oil refining top the list of these crimes. They are also involved in kidnapping and armed robbery.

Illegal mangrove harvesting and culturally insensitive and conflict-prone commercial gathering of periwinkles in Nembe, Bayelsa State, are emerging as adaptive measures. Here, many of the rest of the population

choose various alternative legal and non-criminal means of earning a living. Some of these means include small-scale trading, poultry business, and use of ocean-going or sea-going boats with outboard engines for fishing. This is in stark contrast to canoes, which can only be used in nearby and shallow streams.

Some of the coping mechanisms such as piracy, kidnapping, illegal oil bunkering, massive cutting of mangrove trees for sale and armed commercial picking of periwinkles in culturally prohibited places, pose a threat to peace. They contribute to insecurity, inter-community feuds and conflict. For example, piracy, involving the stealing of fishing boats and nets from fisherfolks at sea has long become a source of worry and fear among sea users. They attack passengers and boat drivers, stealing personal belongings and sometimes killing them where there is resistance. Participants gave several instances of passengers and drivers left stranded and sometimes forced to jump into the water because they had no money to hand over to pirates. On several occasions, fisherfolks had to abandon boats whose engines had been stolen. There was the case of two sons of a fisher woman (widow of a fisher man), who were probably killed by pirates as they never returned from their fishing adventure.

## Key Finding

### Social, economic and environmental effects of climate change

- The indicators of climate change such as coastal erosion, sea-level rise, unpredictable rainfall patterns, excess heat, sea encroachment on land, rainstorms and flooding are common with different degrees of impact on the people. The indicators were experientially and qualitatively measured and found to be common or cross-cutting across the study locations. There is, however, the peculiar case of thunderstorms in Finima, Rivers State, which is greatly feared because of their antecedent dangerous impact on life. When asked to talk about how these issues affect them, participants mentioned fishing and farming as the most affected, being the key traditional occupations of the people. The impact on the local economy of families and communities is severe and indicative of economic insecurity conditions posing an existential threat to human security. The broader implications for physical security and social conflict relate to criminal conflict, not only to the entrenched economic-driven rival cult activities in politics, kidnapping, piracy, armed robbery, but also to community, family, and inter-communal concerns for economic wellbeing of people. The result is seen in increasing conflictive relationships. Disagreement between husband and wife over declining income from fishing is common. Those who rent fishing boats from owners (mostly women) also regularly have issues over replacements when the engines of the fishing boats are stolen. Finally, farmers and fishers quarrel among themselves in addition to growing resentment against pirates.
- Most participants pointed to depleting fisheries resources and limited land as contributing factors to the growing inability of people to provide for their families. This is affecting the subsistent and smallholder fishing and farming traditions of the people, as sources of income and food have waned. Food insecurity was highlighted by participants as a key element of this change. The land is a key factor of production in the peasant rural economy, but it is increasingly becoming scarce due to endless sea encroachment. Roads and houses have been lost to coastal erosion. Even those forced to move inland face a challenge of lack of resources to build houses for themselves.

There is a tacit problem of struggle for land and other resources, especially among displaced persons and those whose livelihoods have been severely affected by climate change. This struggle alone is a recipe for potential and actual conditions of social conflict within family and community. These issues continue to affect communities in an atmosphere of lack of basic social amenities such as hospitals, potable water, schools, electricity, etc.

### Coping Strategies

- Fishers using local canoes and experiencing low catch in shallow waterways are switching to fishing boats with outboard engines. As expensive as these boats are, women appear to have better means of owning the majority. They have played a key role in the fishing business chain as retailers for a long time. Consequently, they may have had a better chance of earning more money in savings than men. Participants said most of the boats were purchased by women with loans.
- Participants expressed determination to forge ahead with life, amid the severe effects of climate

change, by exploring alternative economic activities. Petty-trading, poultry, moving inland to settle or engage in farming, skill retooling, fisheries and migration to urban areas are some of the legitimate coping decisions people make.

- Some have taken to crime. Kidnapping, piracy, unhealthy struggle for land, massive cutting of mangroves, illegal picking of periwinkles (in Bayelsa State), oil bunkering and rival cult activities are some of the activities that locals are linked to which participants blamed on climate change. Notably, many young people involved in piracy and kidnapping were said to be fishers previously.
- Current massive cutting of mangroves is due to its market value and utility. People are resorting to it for the woods needed for the construction of living houses.
- Other coping strategies, include planting of special species of grasses capable of holding soil against erosion. The Indian Bamboo is commonly planted in some of the communities to provide shoreline protection. Though it can itself be uprooted by erosion, it was said to be very useful in many instances by slowing damage on land and houses.

### **Insecurity and Conflict**

- Climate change creates social, economic, and environmental conditions that are conducive to struggles for scarce resources among locals in coastal communities of the Niger Delta. Participants linked many climate change issues such as coastal erosion, floods, unpredictable rainfall, sea-level rise, and hot weather with economic and food insecurity at family and community levels. Participants said there are increasing cases of friction within families over rising inability of husbands to provide for their households due to poor yields in fishing and farming. There are cases of conflict arising from these conditions. Conflicts among fishers take different forms, including the struggle to fish in certain waters while preventing others because of the use of unacceptable fishing methods. For example, fishers who use chemicals to fish attract condemnation by many communities. Participants emphasized this unethical and unhealthy practice as a source of existential and potential conflict among fishing communities which sometimes assume ethnic dimensions. In the same vein, farmers frequently have issues with other farmers whenever floods occur as victims attempt to channel floodwater through others' farms to a river. Thus, channeling floodwater to a river is not trouble-free. Female fishing boat owners often have problems with male renters. This manifests mostly when the boats are stolen by pirates. The disagreement is usually about who has the responsibility to replace the stolen boat.
- The loss of agricultural land, homes, and community infrastructure such as cemeteries and roads make people vulnerable to conditions of insecurity and conflict over how to overcome the effects or impact.
- Decline in fisheries resources and farming threaten food security. Fisherfolks are increasingly becoming unable to earn enough income from fishing to take care of family. Even the choice of sailing farther away from nearby rivers to increase the chance of better catches, sometimes, result in conflict as in the case of rivalries among fishers in Akwa Ibom, Bayelsa, Delta, Cross River and Rivers States.
- Choices about alternative sources of livelihood are fraught with existential disagreements and conflict within families and communities, and between communities.
- The search for alternative livelihood sources generates inter-community suspicion that leads to conflict. Others directly target crimes such as piracy and kidnapping as alternative sources of income, leading to criminal and communal conflicts. Struggle over scarce resources such as land and fishing spaces are conditions created by climate change clearly pointing in the direction of conflict.
- Participants linked most abduction and piracy activities with those who previously had fishing as occupation but were disillusioned and discouraged.
- The massive harvest of mangroves for firewood and the construction of houses in Brass and Akassa in Bayelsa, set some chiefs on the road to conflict with their fellow chiefs.

## Nature of Conflict

Climate change has indirect impact on conflict through its social, economic, and environmental consequences. This is supported by a segment of the available literature highlighting the relationship.

## Policy Recommendations

- Climate change has far-reaching implications for the well-being of vulnerable rural communities. Adaptation and mitigation measures remain key elements in any response to the threats posed to communities by flooding, erosion, excess heat, thunderstorms, and sea encroachment. Addressing the social, economic, environmental, insecurity and conflict effects of climate change in the context of adaptation and mitigation is a complex task. It requires combined efforts of government, civil society, business, individuals, communities, and multilateral institutions. Below are some specific recommendations to the government, civil society, communities and policymakers, derived from the findings of the study:

### a) **Government**

- Protect shorelines of communities threatened by coastal erosion and floods.
- Invest in projects that support climate change adaptation in communities, such as providing clean water and microcredit to support agriculture and fisheries.
- Rehabilitate damaged infrastructure and build new ones to ease transportation in coastal communities.
- Provide lightening arrestors in vulnerable communities.
- Promote awareness on the importance of tree planting and mangroves, and support community adaptation efforts such as the planting of special grasses and Indian bamboo, which is known among the locals to be effective in checking erosion and flooding.
- Provide mini-drains and gutters to channel floodwater away from farms and villages.
- Provide vocational training and skills for the youth to afford them opportunities to address the impacts of climate change.
- Remove invasive plants from the shorelines and halt illegal logging in mangrove forests.
- Work with local communities to combat piracy, kidnapping and armed robbery.
- Make governance more inclusive with communities more actively involved.
- Train members of the oil and gas host communities in monitoring and advocacy to reduce illicit oil refining activities.
- Create and pay vigilantes to support the fight against piracy and other crimes.
- Position gunboats in strategic locations on oceanic waterways to fight pirates.

### b) **Civil Society**

- Provide more voice to powerless communities by defending their rights and raising their awareness about climate change.
- Educate community members on conflict-sensitive responses to effects of climate change.
- Provide stronger voice against oil theft and mangrove destruction.

### c) **Communities**

- Raise awareness about climate change and protect ecosystems at the community level.
- Avoid environmentally destructive actions like mangrove destruction.
- Embrace climate change education and opportunities for personal advancement with skills and vocation.
- Promote peaceful resolution of conflicts in communities.

- Take ownership of the struggle against illegal oil bunkering as a means of survival among youths.

#### **d) Business**

- Clean all oil-contaminated land and water and stop gas flaring in the Niger Delta.
- Provide lightening arrestors in Finima, Rivers State.

### **Research Findings and Project Implementation**

Answers to key questions of the study with data gleaned from analysis of textual materials and those derived from the field through interviews and focus group discussions point in the direction of the reality of climate change and its impact on the socio-economic life of people. They suggest that the social, economic and environmental outcomes have indirect impact on security and conflict. For the intervention of the project team, here are a couple of recommendations:

- Use cross-cutting instruments in response to the coping needs of coastal communities based on issues that commonly characterize them such as the social, economic, and environmental conditions that make them vulnerable to insecurity and conflict.
- Adapt and promote European Union policy framework such as the Integrated Coastal Zone Management (ICZM)<sup>6</sup> and Maritime Spatial Planning within the limit of unique and nuanced social, economic and environmental settings in West Africa.<sup>7</sup>
- Support local agriculture and fishing with training, modern farming tools, and micro-credits to tackle the threat of food insecurity arising from disruptions in seasonal circles of farming and fishing across communities.
- Establish effective, efficient and functional early warning systems to monitor climate-induced insecurity and conflict in the communities, and to support communities and state authorities.
- Support regular scientific and social research on climate change and conflict in West Africa, and advocacy around the uptake of findings by wider civil society and climate policy at local, national and multilateral fronts.
- Strengthen community resilience to climate change by supporting poverty reduction projects such as skills development and smart agriculture to deal with the problem of hunger, unemployment, crime, and general human insecurity issues.
- Promote climate education with useful context-specific adaptation and mitigation strategies as key elements.
- Decolonize climate change solutions by promoting and utilizing local knowledge and de-emphasizing capitalist or market solutions.
- Promote projects and ideas for legitimate income and livelihoods diversification, especially through renewable energy solutions.
- Project implementation should be guided by conflict-sensitive and “Do No Harm” principles.
- Build resilience of communities through sustained environmental bottom-up peacebuilding and inclusive approaches in partnership with relevant government agencies.

<sup>6</sup> European Commission: [https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index\\_en.htm](https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm)

<sup>7</sup> The aim of MSP is protection of the West African marine environment. On the other hand, the ICZM is an integrative, interactive, inclusive, sustainable and holistic approach to addressing complex environmental problems in coastal areas. The concept is traced to the 1992 Earth Summit in Rio de Janeiro and presented in Agenda 21. [http://www.coastalwiki.org/wiki/Integrated\\_Coastal\\_Zone\\_Management\\_\(ICZM\)](http://www.coastalwiki.org/wiki/Integrated_Coastal_Zone_Management_(ICZM))

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## 1.0 Context

The Nigerian Meteorological Agency defines climate change as ‘a long-term change of weather patterns and temperatures at universal scale.’<sup>1</sup> The notion that this (climate change) is a cause of insecurity and conflict is increasingly gaining the attention of analysts, policymakers, and civil society especially in multilateral climate politics and debates.<sup>2</sup> Yet, sufficient evidence and understanding of the pathways at the community level in coastal areas of West Africa remains an issue.<sup>3</sup> *Coping with Climate Change as a Cause of Conflict in Coastal Communities in West Africa* is a project supported by the European Union in terms of funding. The project, being implemented by a consortium of four civil society organisations, is driven by the hypothesis that climate change is a cause of conflict in the Gulf of Guinea states. This study was conducted as the initial aspect of the project to inform decisions about the tools for intervention in coastal communities where climate change is either directly or indirectly leading to insecurity and conflict. The focus was on the Niger Delta, with analysis contributed by members of the research team in Togo and Senegal.

The context is significant. Although the Niger Delta has what some refer to as core-geographical meaning that only refers to a few states in the South-South of Nigeria, it is widely and politically defined as the oil-producing states. These states are nine in number at the moment, namely, Abia, Akwa Ibom, Bayelsa, Delta, Cross River, Edo, Imo, Ondo and Rivers. Oil was first discovered in commercial quantity in the present day Bayelsa State in 1956, and by 1958 the country had recorded its initial commercial shipment abroad. Over the years, oil has become the main commodity of interest to the government because of its huge national revenue and foreign exchange earning capacity. Apart from gradually growing into becoming Africa’s leading oil producer, Nigeria has taken steps to also become a key gas exporting country, now contributing about 7% of the world’s supply.

In the last two decades, conflict and insecurity in the Niger Delta have been mainly about the reaction of local communities to the activities of corporations and the federal government in the oil and gas industry under a joint venture relationship. The people of the region engaged in nonviolent agitation for development of communities with money generated from oil production and protection of the environment from pollution through regular oil spills and gas flaring. The agitation later escalated to violent campaigns by armed groups. As a result, the Niger Delta saw, in the 2000s, the emergence of militant groups with leaders who did not include climate change in their grievances against international oil companies and the government.

These campaigns were led by the Movement for the Emancipation of the Niger Delta (MEND) targeting oil facilities, government security and, kidnapping and taking oil workers hostage. Previous studies concentrated on the oil and gas industry and conflict in the Niger Delta, making this study a crucial contribution to knowledge on the relationship between climate change, insecurity and conflict from the perspectives of coastal community people.

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1 Nigerian Metrological Agency. <https://nimet.gov.ng/publications-and-bulletins/>

2 von Lossow, T., Schrijver, A., van der Kroon, M., van Schaik, L. & Meester, J.(2021). Examples of climate security practices. In *Towards a Better Understanding of Climate Security Practices*. Clingendael Institute. [Http://www.jstor.org/stable/resrep32151.9](http://www.jstor.org/stable/resrep32151.9)

3 There is relative agreement among researchers that the connection between climate change and conflict is mainly indirect in the sense that climate change creates the conditions that serve as drivers or triggers of conflict. In other words, climate issues such as coastal erosion, rising sea level, mangrove depletion, floods, increased temperatures make communities vulnerable to conflict (See Professor N. Zabbey. 2022. Literature review on climate change, insecurity and conflict in coastal communities in West Africa, submitted to the lead researcher as part of this study).





**Figure 1: Map of Nigeria showing the Oil Producing States in the Niger Delta Region (not including offshore production outside the lower limit of the continental shelf)<sup>4</sup>**

Source: Item, iBook, Item and Petters (2013)

## 1.1 Objectives of the Study

The study aims to identify evidence of climate change as a cause of insecurity and conflict. The rest of the objectives are to:

1. Examine the social, economic and environmental effects of climate change.
2. Analyze the impact of coastal erosion, devastating floods, rainfall patterns, pollution and destruction of mangroves on fisheries, farming and livelihoods of people in coastal communities.
3. Evaluate how community people are coping with the problem of rainfall patterns, erosion, devastating floods, rising temperatures, and their implications for conflict?
4. Explain the nature of policy response and framework for climate change in the community, national and regional level.
5. Explore the relationship between climate change and conflict and whether it is direct or indirect.
6. Assess what needs to be done in the short and long term to deal with the problem of climate change, insecurity and conflict in the community, national and regional levels.

<sup>4</sup> Aniefiok E. Ite, Udo J. Ibok, Margaret U. Ite, Sunday W. Petters. 2013. Delta American *Journal of Environmental Protection*. 2013, 1(4), 78-90 doi:10.12691/env-1-4-2

## 1.2 Methodology

The design of the methodology was based on the goal of the *Coping with climate change as a cause of conflict in coastal areas* project. Responding to coping needs of people with the relevant tools is a critical element of the project. The perception of participants was, therefore, crucial for understanding their experiences and local knowledge of climate change, as well as putting in proper perspective, areas in which the project team could make their interventions over the next three years.

The study, therefore, had two main components, namely, extensive literature review and field data collection. The review provided an opportunity for the collection of data from secondary scientific sources on climate change in the Niger Delta and insights into the gaps in the literature. Field data were collected in two coastal communities of each of the five states under study. A total of 10 focus group discussions and 50 interviews were conducted across the states. The participants included men, women, youth, fisherfolks, farmers, community leaders, representatives of state ministries of environment and their climate change units, local government and traditional rulers. The triangulation of data collection methods was based on the nature of the data required for addressing the key questions of the study. It was further based on the usefulness of the methods in a study that featured qualitative ethnographic designs in exploring the experience of participants with climate-related problems. Triangulated analysis of the data was done by using qualitative content analysis techniques that permitted data sorting, categorising, coding and identifying patterns with the assistance of ATLAS.ti software.

The study locations included two coastal communities in Togo and Senegal. For Togo, Doeiv Kope and Kpeme were purposively selected because they are key coastal areas characterised by fishing and farming as major occupations of the local population, and other economic activities such as oil and gas plus phosphate production. In Senegal, the study focused on Kayar fishermen communities (Great Coast) and Niiodior in the Saloum Delta.

The planning and design processes were driven by participatory research principles because of the action-oriented nature of the study. Health of Mother-Earth Foundation hosted the lead researcher and the project team in an initial planning meeting in Port Harcourt. The methodology workshop that followed the recruitment of researchers provided an opportunity for the training of the Research Assistants in participatory research. It also provided an opportunity for shared conceptualization of the research process, goal and objectives of the study, key variables, and expectations regarding timelines and fieldwork responsibilities. The key questions were discussed and agreed upon in line with the goal of the research. Professor Nenibarini Zabbey, who reviewed the literature on climate change, insecurity and conflict in the Gulf of Guinea presented the findings. The discussions that followed helped the research team to improve on the already framed research questions as one of the main gaps in the literature remained the lack of sufficient studies exploring the evidence of links between climate change and, insecurity and conflict in the case of West Africa. Besides that, the literature noted the indirect pathways of the assumption that climate change leads to conflict. This calls for more investigation of the evidence as the world continues to see adaptation as a crucial element in dealing with the problem of climate change in vulnerable communities in the developing world.

One of the main challenges the research faced was determining the number of coastal communities to visit for data collection in the Niger Delta. Nine states in Nigeria make up the Niger Delta by political definition. All nine, Abia, Akwa Ibom, Bayelsa, Delta, Cross River, Edo, Imo and Rivers, are oil-producing states and characterized by extensive coastal and marine features. The choice of Akwa Ibom, Bayelsa, Delta, Cross River and Rivers as sample states for the study was made purposively and jointly. This was with consideration of the issue of limited resources, time frame for the implementation of other aspects of the project, and the rich coastal nature of these states which is common with many of them except Imo State.

**Table 1. Communities and states visited for data collection in the Niger Delta**

S/n	States and communities	FGDs	Interviews
1.	Akwa Ibom $\alpha$ . Ibeno (Ibeno LGA) $\beta$ . Okoroete (Eastern Obolo LGA)	1 with 10 participants in each community drawn from among: women, youth, men and traditional rulers.	10 interviewees selected through snowballing.  Participants included government officials, politicians, community people, illegal oil refiners, farmers, fisherfolks, civil society groups,
2.	Bayelsa State $\alpha$ . Akassa (Brass LGA) $\beta$ . Etiema/Agbakabiriyai/Igbetaewoama (Nembe LGA)	1 with 10 participants in each community drawn from: women, youth, men, and traditional rulers.	Ditto
3.	Cross River State $\alpha$ . Esuk Mbak (Akpabuyo LGA) $\beta$ . Creek Town (Calabar South LGA)	1 with 10 participants in each community drawn from: women, youth, men, and traditional rulers.	Ditto
4.	Delta State $\alpha$ . Ogulaha (Burutu LGA). $\beta$ . Ogidigben (Warri South LGA)	1 with 10 participants in each community drawn from: women, youth, men, and traditional rulers.	Ditto
5.	Rivers State $\alpha$ . Kono (Khana LGA, Ogoni) $\beta$ . Bonny (Bonny LGA)	1 with 10 participants in each community drawn from: women, youth, men, and traditional rulers.	Ditto

The study further applied multi-stage analytical approach that included a sense-making meeting with research assistants presenting their preliminary findings from the field for joint analysis. Their preliminary findings were discussed to identify key issues. The comprehensive reports of the field data collection submitted by research assistants, and transcripts of interviews, focus group discussions, interview notes, field diaries and photos were content-analysed with interpretive qualitative technique. This involved systematic and thematic sorting of the vast qualitative data for the identification of patterns. The analysis was supported with ATLAS.ti software.

## 2. Literature Review

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Climate change is a global problem with varied impacts and unequal capacities of communities and governments to respond with adaptation and mitigation actions. Scientists have been consistent with arguments on the impacts, including the enormous threat it is already posing to human security.

This, and the reality of the associated diverse social and economic conditions continue to reinforce the idea that the climate problem is a “risk multiplier.”<sup>1</sup> The economic, social, political and environmental character of climate change is relevant not only for understanding conflict, but also for making decisions about policy interventions and peace building activities in communities. This calls for more evidence that climate change is causing insecurity and conflict. Meanwhile, the supposition linking climate change and conflict has not been sufficiently studied to improve policy advocacy from the perspective of local populations in West Africa. Much of what has been written so far, focused on Western countries, and has stressed an indirect impact of climate change on conflict.<sup>2</sup>

The IPCC’s Sixth Assessment report argues that the world is not safe even with limiting temperatures to 1.5 degrees Celsius.<sup>3</sup> The report reinforced the argument that the impacts of climate change are already with us in various ways, including the vulnerability to conflict. The implications for development were implicit in the IPCC report. Inequity, conflict and development challenges such as inadequate public services, poverty, and weak governance are making communities defenseless and unable to adapt to climate change impacts. In all, Sub-Sahara Africa remains one of the most vulnerable regions in the world.

The impact of climate change is felt globally, although disproportionately, depending on regional particularities such as ecological context, economy, population density, land use, etc. Coastal communities in the Gulf of Guinea are among the region’s most vulnerable to climate change. This has even been exacerbated by environmental degradation through industrial and destructive extraction of natural resources. The impact of all this on insecurity and strife has been noted. Climate change, environmental degradation, insecurity and conflict are correlated in the existing literature. This raises the need for proper understanding of the dynamics and pathways of climate-induced tensions. Climate change clearly means a complex web of human insecurity and adaptation challenges that need to be better understood in context.

The review focused on the Niger Delta where the effects of climate change have been found to include environmental degradation, devastating floods, erosion, biodiversity loss. These impact on livelihoods, poverty, displacement of people, desecration of cultural heritage, and outright loss of traditional communities. It is also estimated that a 1m rise in sea level by 2100 will be capable of engulfing 18,000 square kilometres of Nigeria’s coastline (that is about 26% of the Niger Delta).

The victims of climate change and environmental degradation are maladaptive. Maladaptation in the Niger Delta includes obnoxious resource exploitation and environmentally unfriendly livelihood ventures. Examples include artisanal petroleum refining, dynamite and chemical fisheries, and unsustainable mangrove harvesting. All these aggravate the degradation of the environment and increases the vulnerability of communities to the impact of climate change. Many people living in rural communities in Africa, including the Niger Delta, depend on informal sectors such as farming, fishing and hunting for livelihoods. Climate change impacts food systems, leading to food insecurity, malnutrition, illness and poverty. In the most pessimistic scenarios, the socio-economic crisis can snowball in a violent conflict.

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1 See Berman, Couttenier, Rohner, & Thoenig, (2017, p.1564-1570); Hansungule, & Jegede (2014, p.256-291); and Satgar (2018). <https://doi.org/10.18772/22018020541.6>

2 See <http://www.jstor.org/stable/resrep24787>; and <http://www.jstor.org/stable/resrep34005.5>

3 See Intergovernmental Panel on Climate Change (2022). <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i>

Given the complex interactions between climate change and environmental degradation as drivers of insecurity and conflict in the Gulf of Guinea, it is posited that the solutions (mitigation and adaptation) require systems thinking. The current coping strategies in the Niger Delta region have been highlighted and new adaptation options recommended within the broad framework of the newly released Intergovernmental Panel on Climate Change sixth assessment (impacts, adaptation, and mitigation) report.<sup>4</sup>

**Figure 2: The Gulf of Guinea Countries**



Source: Google

The Gulf of Guinea includes many of West African nations: Benin, Cameroon, Cote d'Ivoire, the Democratic Republic of Congo (DRC), Equatorial Guinea, Gabon, Ghana, Liberia, Nigeria, the Republic of Congo, São Tomé and Príncipe, Sierra Leone, and Togo (see figure 2). The area presents a wide range of cultural, geological, and geographical heterogeneities. The coastal areas of West Africa constitute about 35% of the population in the region and generates over 55% of its Gross Domestic Product. The huge GDP comes from extracting the main natural resources such as oil and gas.

This and other ancillary human activities make the natural and human systems in coastal communities in the Gulf of Guinea highly vulnerable to environmental degradation as well as the risks and hazards of climate change. Population pressure, the dynamic geomorphology of the coastline, unregulated exploitation, land use and waste discharges exacerbate the socio-ecological vulnerabilities.<sup>5</sup>

<sup>4</sup> Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report 2022. Impacts, Adaptation and Vulnerability; Summary for Policymakers. <https://www.ipcc.ch/report/ar6/wg2/>

<sup>5</sup> See M. Maanan, H. Rueff, N. Adouk, B. Zourarah, and Rhinane, H. (2018) for details. Also see B. Faye (2010). Coastline dynamics on sandy littorals from Mauritania to Guinea-Bissau (West Africa): regional and local approach through photo-interpretation, image processing, and ancient maps analysis. PhD Thesis, University of Brest

**Table 2: Key Environmental degradation issues in the coastal areas of countries in Gulf of Guinea**

Country	Environmental issues
Benin	Flood, Erosion, Water and Waste pollution <sup>6</sup>
Cameroon	Flood, Biodiversity (Mangrove) loss <sup>7</sup>
Cote d'Ivoire	Flooding, Water and Air pollution <sup>8</sup>
Democratic Republic of Congo (DRC)	Flooding, Water Pollution, Soil erosion, Deforestation <sup>9</sup>
Equatorial Guinea	Erosion, Water pollution <sup>10</sup>
Gabon	Deforestation, Waste disposal, Water pollution <sup>11</sup>
Ghana	Coastal erosion, flooding <sup>12</sup>
Guinea	Flooding, Coastal erosion <sup>13</sup>
Liberia	Soil erosion, Deforestation, Biodiversity loss, Pollution of coastal waters <sup>14</sup>

6 World Bank (2019) The cost of coastal zone degradation in West Africa: Benin, Côte d'Ivoire, Senegal and Togo. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/31428>

7 See W.A. Abia, C.A. Onya, C.E. Shum, W.E. Amba, K.L. Niba, and E. A. Abia (2021). Food security concerns, climate change, and sea level rise in coastal Cameroon. In: N. Oguge, D. Ayal, L. Adeleke, I. da Silva (Eds) African handbook of climate change adaptation. Springer, Cham. [https://doi.org/10.1007/978-3-030-45106-6\\_21](https://doi.org/10.1007/978-3-030-45106-6_21) ; C. A. Munji M.Y. Bele, A.F Nkwatoh, M.E. Idinoba, O.A. Somorin, and D. J. Sonwa, (2012). Vulnerability to coastal flooding and response strategies: the case of settlements in Cameroon mangrove forests, *Environmental Development*, 5, 54-72, <https://doi.org/10.1016/j.envdev.2012.10.002>

8 World Bank (2019).

9 S.E. Nicholson, A.H. Fink, C. Funk, D.A. Klotter, and A.R. Satheesh (2021). Meteorological causes of the catastrophic rains of October/November 2019 in equatorial Africa, *Global and Planetary Change*, Volume 208, <https://doi.org/10.1016/j.gloplacha.2021.103687> ; Relief web (2020). Democratic Republic of Congo and Republic of Congo : floods - information bulletin; CIA Factbook, (2021), <https://www.cia.gov/the-world-factbook/countries/>

10 R.N. Mico, and O. Kargo (2013). Coastal erosion in Equatorial Guinea. *International Journal of Scientific & Engineering Research* 4,3,1-6

11 CIA World Factbook (2021).

12 Flood List (2021, August 19). Ghana – Major Roads, Bridges and Over 100 Homes Destroyed in Upper West Region Floods. Accessed from <https://floodlist.com/africa/ghana-major-roads-bridges-and-over-100-homes-destroyed-in-upper-west-region-floods> accessed on April 11, 2022; Flood List (2021, October 22). Guinea – Floods Leave 5 Dead, 800 Homes Destroyed and 2,500 People Displaced. <https://floodlist.com/africa/guinea-floods-september-2021> ; UNESCO (2021) Ghana's coastline, swallowed by the sea. United States Agency for International Development (2007) Adapting to climate variability and change: a guide manual for development planning; United States Agency for International Development (2013) Coastal Hazards and Flooding Risk in Ghana's Western Region. Issue Brief 7 in series: Our Coast, Our Future.

13 Flood List (2019)

14 CIA World Factbook (2021)

Nigeria	Coastal Erosion, Flooding, Pollution, Gas flaring, subsidence, Deforestation, Solid wastes disposal <sup>15</sup>
Republic of Congo	Flooding, Water Pollution, Soil erosion <sup>16</sup>
São Tomé and Príncipe	Soil Erosion, Deforestation, Illegal logging, Biodiversity loss, inadequate waste treatment <sup>17</sup>
Sierra Leone	Flooding, Landslides, Storms <sup>18</sup>
Togo	Erosion, Water pollution, Air pollution, Flooding <sup>19</sup>

There is a lot of flooding and erosion in the area. This is in line with the geographical and climatic conditions of the region. Lives, properties and infrastructure have been lost due to flooding and erosion. As the situation worsens, the consequences would include poverty and attendant increase in conflict and insecurity.

## 2.1 Niger Delta Coast

Nigeria has a long coastline in the Gulf of Guinea, covering 853 kilometres, with an exclusive economic area covering 210,900 km<sup>2</sup>. The Niger Delta region was built 50 million years ago during the upper Cretaceous period from fluvial and marine sediments.<sup>20</sup> The Niger River and the associated tributaries have contributed over 1.1 km of shelfy marine as well as deltaic sediment aggregations.<sup>21</sup> The Nigerian coastline is divided into four geomorphic zones based on their geomorphology (nature of the landscape, origin, dynamics). These are the barrier-lagoon coast (250 km), transgressive Mahin mud coast (75 km), arcuate Delta (440 km) and strand-type sandy coast (85 km). The region extends from the mouth of the Benin River to the Imo River. It is marked by a chain of 20 barrier islands with extensive mangrove swamps. It is the third largest delta in the world and home to the fourth largest expanse of mangrove forest in the world.<sup>22</sup> The coastal environment consists of three vegetation zones, namely freshwater, beach ridges and salt-water. Whereas the coastal plain and freshwater zone are characterized by tropical forest trees, the

15 L. Amadi, and C.U.M. Ogonor(2015). Climate change, environmental security and displacement in Nigeria: Experience from the Niger Delta flood disaster, 2012. *African Journal of Environmental Science and Technology* 9 (1), 53-64; NDES (1997). Niger Delta environmental survey. Final Report Phase 1. N. Zabbey, F.D. Giadom, B. B. Babatunde (2019). Nigerian coastal environments (835-854). C. B.T. Sheppard Ed. World seas: an environmental evaluation, Academic Press. N. Zabbey, I.G. Ekpenyong, G.N. Nwipie, I.D. Chris and K. Sam, (2021). Effects of fragmented mangroves on macrozoobenthos: A case study of mangrove clearance for Power-line Right-of-Way at Oproama Creek, Nigeria. *African Journal of Aquatic Science* <https://doi.org/10.2989/16085914.2020.1832437>; N. Zabbey, N. C. Kpaniku, K. Sam, G.N. Nwipie, O.E. Okoro, N. Zabbey, and B.B. Babatunde(2021). Could community science drive environmental management in Nigeria's degrading coastal Niger delta? Prospects and challenges. *Environmental Development* 37 <https://doi.org/10.1016/j.envdev.2020.100571>; UNEP (2011). An Assessment of the Environment of Ogoniland. [http://postconflict.unep.ch/publications/OEA/UNEP\\_OEA.pdf](http://postconflict.unep.ch/publications/OEA/UNEP_OEA.pdf); A.T.Salau, A. T. (1993). Environmental Crises and development in Nigeria. Inaugural Lecture Series No.13, University of Port Harcourt.

16 Flood List (2021); Relief Web (2020).

17 CIA World Factbook (2021)

18 World Bank (2017) Sierra Leone Rapid Damage and Loss Assessment of August 14<sup>th</sup>, 2017 Landslides and Floods in Western Area. <https://openknowledge.worldbank.org/handle/10986/28836>; World Bank (2020) Disaster Risk Management Diagnostic note: Sierra Leone. Accessed from <https://openknowledge.worldbank.org/bitstream/handle/10986/35809/Sierra-Leone-Disaster-Risk-Management-Diagnostic-Note.pdf?sequence=1&isAllowed=y>.

19 World Bank (2019)

20 Amadi and Ogonor, (2015).

21 UNEP (2011); Amadi and Ogonor (2015).

22 M. Spalding, M. Kainuma, and L. Collings, (2010). World atlas of mangroves, *The International society for Mangrove Ecosystems, Okinawa*; UNEP (2011). Also see N. Zabbey et al., (2019).

beach ridge vegetation is dominated by mangroves. It also features mangrove-associated shrubs, palms and sedges, depending on tidal flat elevations. The red mangrove (*Rhizophora racemosa*) is dominant in the salt-water intertidal region. Though four-fifth of the revenue of Nigeria and almost three-quarter of its exports come from the Niger Delta, an estimated 70% of the region's population of 31 million people live below the poverty margin.<sup>23</sup> The people of the area are predominantly fishers and farmers.<sup>24</sup>

## 2.2 Environmental Degradation in the Niger Delta

The unpublished Niger Delta Environmental Survey of 1997 report contains a detailed analysis and ranking of important environmental issues in the Niger Delta.<sup>25</sup> There is substantial amount of literature on the impact of environmental deterioration in the Niger Delta, due mainly to oil pollution. The region is one of the worst oil-impacted locations on the planet, with an estimated 1.4 – 2.1 million m<sup>3</sup> of oil leaked per year.<sup>26</sup>

## 2.3 Impact of Climate Change on Coastal Communities in the Niger Delta

A “coast” is a strip of land that stretches from the coastline inland to the first notable change in topographical features (e.g., vegetation, tidal effect) and is indefinite in length and width (perhaps tens of kilometres). Water bodies are vital life-sustaining systems along the entire Nigerian coast, comprising 45,000 km<sup>2</sup> of floodplains and streams mixed with human settlements.<sup>27</sup> Because they are home to various critical ecosystems, natural resources and a huge human population, coastal regions are crucial to the globe. According to Small and Nicholls,<sup>28</sup> about 1.2 billion people (or 23% of the global population) live within 100 km of the coastal areas. The number would increase to 50% in the coming years.<sup>29</sup> The majority of this growing population is concentrated in the Gulf's main cities, such as Lagos, Port Harcourt, Accra and Abidjan.

## 2.4 Rainfall, Sea-level rise and Flooding in the Niger Delta

The Niger Delta is naturally a high precipitation area.<sup>30</sup> The causal mechanisms of heavy precipitation are: proximity to the Atlantic Ocean, landmass dissected by estuaries, rivers, streams and other tributaries, and high equatorial temperatures. The high temperature causes a high rate of surface evaporation. Vapour is carried northwest by the southeast trade wind. The winds funnelled up the Bight of Biafra hit the Adamawa massif and cause it to rise upwards. The cooled water vapour condenses and falls as rain on the Niger Delta, making the area one of the wettest on earth.

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23 M.E. Ikehi, F.O. Ifeanyieze, F.M. Onu, T.E. Ejiofor, and C.U. Nwankwo (2022). Assessing climate change mitigation and adaptation strategies and agricultural innovation systems in the Niger Delta. *GeoJournal*, 18, 1-16 <https://doi.org/10.1007/s10708-022-10596-6>; Ikehi, M. E. (2015). Impacts of climate change on fishing and fish farming in the Niger Delta region of Nigeria. *Direct Research Journal of Agriculture and Food Science*. 3, 1-6; J. Jackson, T. Akujobi, and A.U. Dan (2016). Crude oil exploration and underdevelopment in Nigeria: A resource curse analysis. *Technology Science Review*, 7, 31–44; D.V. Johnson, A.E. Gobo, O.D. Ngererebara, and E.N. Ekaka-a(2021), Descriptive Statistics Analysis of 36 years Rainfall Events of Port Harcourt, Nigeria. African Scholar Publications & Research International. 20(2) ; O. Linden, and J.Pålsson(2013). Oil contamination in Ogoniland, Niger Delta. <https://doi.org/10.1007/s13280-013-0412-8>; National Population Commission (2009).

24 UNDP (2006). The Niger delta human development report, UNDP Nigeria. [http://hdr.undp.org/sites/default/files/nigeria\\_hdr\\_report.pdf](http://hdr.undp.org/sites/default/files/nigeria_hdr_report.pdf)

25 UNDP (2006; UNEP (2011); O.Moffat(1995) Perception and Reality: Assessing Priorities for Sustainable Development in the Niger Delta, AMBIO. *Journal of Human Environment*, 24, 527-538; Amnesty International (2009). Oil, Environmental Conflict and the Challenges of Sustainable Development in the Niger Delta; Niger Delta Environmental Survey, NDES, (1997).

26 N. Zabbey (2022).

27 Fubara (1988) cited in N. Zabbey (2022).

28 C. Small, C. and R.J. Nicholls,(2003). A global analysis of human settlement in coastal zones. *Journal of Coastal Research*. Vol. 19 (3.) p.p. 584-599. <https://www.jstor.org/stable/4299200>

29 Ibid.

30 Aston-Jones (1998) cited in Zabbey (2022).



Rainfall in the area usually peaks in July and September. However, due to climate change, there has been an increasing trend of unpredictable rainfall and flooding in the Niger Delta. For example, Port Harcourt and its environs experienced major floods in 2006 and 2012.<sup>31</sup> Studies show that flood displaces more people in Nigeria than any other natural disaster, with an estimated 20% of the population at risk.<sup>32</sup>

A comparative analysis of annual rainfall in Port Harcourt, based on the Nigerian Meteorological Agency (NIMET) data (See Table 3) shows a general trend of increasing rainfall.<sup>33</sup> This dramatic surge in rainfall causes severe flooding. For example, in September 2012 high rate of rainfall (409.4mm) caused severe flooding in the Niger Delta, especially in Bayelsa and Rivers State.<sup>34</sup> All the communities at the borders of the Orashi River, as well as upland communities adjoining shoreline communities and parts of the East-West Road, were severely flooded. The communities' critical infrastructure (e.g., residential houses, schools, hospitals), livelihood support systems (e.g., farmlands, business centres) and cultural edifices (e.g., tombs, shrines) were flooded. Some people drowned and thousands of people were displaced.

**Table 3: Monthly and annual rainfall (mm) in Port Harcourt between 1981 – 1985 and 2011 – 2015<sup>1</sup>**

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Mean	Total
1981	75.5	27.5	140.2	102.1	311.4	272.6	348.5	305.7	337.4	171.4	66.0	0.0	179.86	2158.3
1982	30.3	37.9	107.6	147.0	238.3	204.2	431.4	230.0	360.2	143.2	58.3	3.2	165.96	1991.5
1983	0.0	0.0	33.1	114.2	141.3	183.5	310.9	154.4	324.4	304.7	19.8	45.7	136.0	1632.0
1984	0.0	61.6	71.4	170.0	251.4	321.2	225.2	232.8	502.7	143.6	109.4	6.3	174.63	2095.6
1985	9.5	8.9	154.8	208.0	296.8	402.5	397.2	344.3	359.0	161.3	51.6	1.8	199.64	2395.7
2011	0.0	111.1	46.5	113.6	322.8	149.1	298.8	213.0	250.6	182.9	53.5	7.3	145.77	1749.2
2012	23.4	104.0	92.7	247.2	208.0	311.8	359.0	208.6	409.4	205.5	79.0	0.0	187.38	2248.6
2013	40.6	37.0	122.1	210.5	260.1	461.7	274.4	112.9	178.8	304.8	144.0	112.7	188.3	2259.6
2014	57.2	17.7	143.2	215.8	294.5	381.3	265.0	371.2	342.1	368.1	118.6	0.8	214.6	2575.5
2015	4.0	182.7	117.7	130.6	148.8	460.5	187.5	204.9	281.5	275.6	46.7	0.0	170.04	2040.5

<sup>1</sup> Johnson et al (2021) cited in Zabbey (2022).

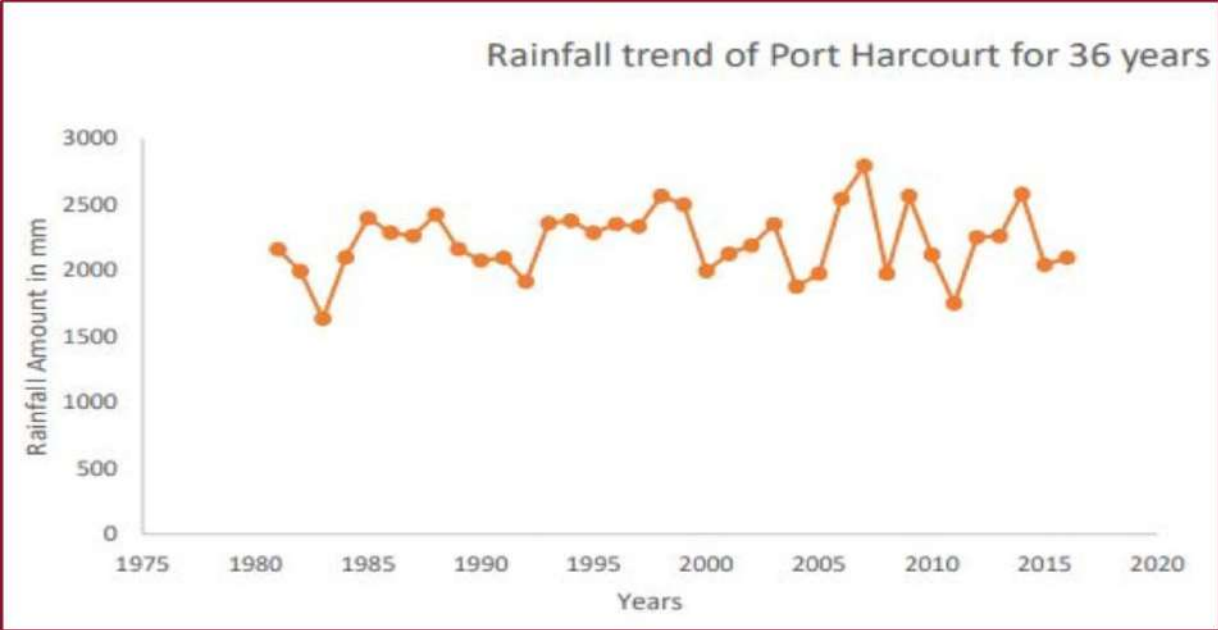
<sup>31</sup> N. Zabbey (2006). Rainfall, flooding and climate change: implications for the socio- economics of Port Harcourt. Paper presented at a roundtable discussion among Civil Society Organizations in Rivers State, organized by Kabetkache Women Development and Resource Centre held at Environmental Rights Action (ERA) Conference Room, Port Harcourt, 28 September 2006.

<sup>32</sup> A.K. Etuonovbe, (2011). The Devastating effect of flooding in Nigeria. Google Scholar; G.T. Cirella, and F.O. Iyalomhe(2018). Flooding conceptual review: sustainability-focalized best practices in Nigeria. *Applied Sciences*. 8, 1558. doi:10.3390/app8091558

<sup>33</sup> Johnson et al., (2021) cited in N. Zabbey (2022); E.U. Itue & A.F. Alonge(2009). Niger Delta Region of Nigeria, climate change and the way forward. <https://www.semanticscholar.org/paper/Niger-Delta-Region-of-Nigeria%2C-Climate-Change-and-Ituen-Alonge>

<sup>34</sup> NEMA (2013) Nigeria post-disaster needs assessment 2012 floods: a report by the federal republic of Nigeria with technical support from the world bank, the European Union, and the United Nations [https://www.gfdrr.org/sites/default/files/publication/\\_P](https://www.gfdrr.org/sites/default/files/publication/_P)

**Figure 3: Rainfall Trend in Port Harcourt for 36 years**



On coastal erosion and inundation in the Niger Delta, Onuoha and Ezirim<sup>35</sup> noted that a 0.2 metre rise in sea level would lead to the displacement of about 200 villages in the Niger Delta region, forcing 80 percent of the delta’s population to higher ground. They further noted that subsidence would increase the vulnerability of the Niger Delta coast to sea-level rise.

**Table 4: Temporal projection of sea-level rise in the Niger Delta<sup>36</sup>**

	Low Estimate				High Estimate			
Sea level rise	0.2m	0.5m	1.0m	2.0m	0.2m	0.5m	1.0m	2.0m
Area of the Niger Delta covered (km <sup>2</sup> )	2,846	7,453	15,125	18,398	2,865	7,500	15,332	18,803

In the Niger Delta, flooding induced by increasing sea-level rise is complicated by factors such as wetland removal, indiscriminate dumping of wastes, subsidence, blocking of natural runoff courses, unplanned infrastructural development and poor drainage systems.<sup>37</sup> In the worst hit areas, entire communities had been submerged. The loss of riparian alluvial land affects farming which is a major occupation of the people. This has far-reaching economic consequences, especially for smallholder farmers who are even

35 . F. C. Onuoha and G. E. Ezirim (2012). The resource curse and national development in Nigeria. In: I. S. Ibaba (Ed.), Niger Delta: constraints and pathways to development. Cambridge Scholars Publishing.

36 L.F. Awosika(1995). Impacts of global climate change and sea level rise on Coastal resources and energy development in Nigeria. In: J.C. Umolu (Ed), Global Climate Change: Impact on Energy Development. DAMTECH Nigeria Limited, Nigeria; E. Uyigue, and M. Agho (2007). Coping with climate change and environmental degradation in the Niger Delta of Southern Nigeria. CREDC Press; Awosika L. F., French G. T., Nicholls R. T. and Ibe C. E. (1992). The impact of sea level rise on the coastline of Nigeria [O’ Callahan J. (Ed.)] In: Global climatic change and the rising Challenge of the sea. Proceedings of the IPCC workshop of Margarita Island Venezuela, 9-13 March. National Oceanographic and Atmospheric administration, Silver spring, M.D., U.S.A, p.690

37 Tell magazine (2008) Environment: Nigeria’s nightmare. No. 32 August 11; Zabbey (2006).

predominantly women.

According to the IPCC, sea-level rise poses an existential threat to low-lying coasts, leading to involuntary migration and low adaptive capacity.

## 2.5 Coastal Erosion in the Niger Delta

Hensen<sup>38</sup> provides a history of climate change. As of 1958, reliable measurements of carbon dioxide had confirmed an increasing concentration of greenhouse gases in the atmosphere. By the 1980s, the global temperature resulting from increased greenhouse gases in the atmosphere had started to rise dramatically. The Niger Delta coastal communities had already begun experiencing the impact of climate change from the 80s. Consequential sea-level rise, flooding and erosion were experienced much earlier because of the region's low-lying nature – barely 2–4m above sea level.

Coastal erosion in some communities (from Lagos to Ibeno) was monitored between 1981 and 1983<sup>39</sup> and the datasets were worrisome (Table 5). Annual rates of erosion at NIOMR erosion monitoring stations along the Niger Delta coastline exceeded 20m, 16-19m, 15-20m, 20-24 m, and 10-14m at Ugborodo/ Escravos, Brass, Koloma, Bonny, and Imo/Rivers, respectively.<sup>40</sup> People in frontage communities have been displaced as a result of coastal erosion, forcing them to migrate involuntarily.<sup>41</sup> Studies illustrate the enormity of land lost to coastal erosion in the Niger Delta, as seen in Table 6 which summarises documented effects of climate change in the region.

**Table 5: Erosion trend along the coast of the Niger Delta from 1981 – 1983<sup>42</sup>**

Community	Rate of coastal retreat (erosion)
ESCRAVOS BEACH	30m
FORCADOS	22m
BRASS	18m
IBENO - EKET	9 m - 13m

## 2.6 Climate Change and Conflict

Wall<sup>43</sup> defines conflict as “a process in which one party perceives that its interests are being opposed or negatively affected by another party”. There are five levels of conflict, namely, personal, interpersonal, intergroup, interorganizational and international conflicts. Conflicts considered in this review are confined to the domains of interpersonal and intergroup (inter-community) conflicts. Climate change

38 J. Hansen, M. Sato, R.K. Ruedy, D.W. Lea, D. and M. Medina-Elizade, (2006): Global temperature change. Proc. Natl. Acad. Sci., 103, 14288-14293, doi:10.1073/pnas.0606291103

39 Ibe, A. C. (2017). Agricultural practice in a changing climate: Beyond infatuation to devotion. Valedictory lecture series, Department of Geology/Institute of natural resources, Environment and sustainable development, University of Port Harcourt

40 J. A. Akankali, and N.A. Jamabo (2012). Effects of Flooding and Erosion on Fisheries Resources in Niger Delta, Nigeria. European Journal of Scientific Research. 90, 1.14-25

41 IPCC (2022)

42 Ibe (2017).

43 Cited in N. Zabbey (2022).

does have an impact on the settings in which certain social interactions occur, potentially modifying the risk of conflict.<sup>44</sup> The climate change-conflict nexus is linked to the effects of climate change on economic growth, resource availability, productivity, wealth creation and poverty.

When conflict arises (for example, conflict among fisheries users), climate change impacts and risks become increasingly complex and difficult to manage. Many studies suggest that the impact of climate change induces socioeconomic challenges and issues that could drive violent conflicts.<sup>45</sup> Poverty increases or aggravates when the sources of food and livelihoods are lost due to climate change impact. Significantly, poverty is a critical conflict driver. It creates conditions that support violence by fuelling discontent and grievance.<sup>46</sup>

Climate change, according to Barnett and Adger<sup>47</sup> may increase the risk of violent conflict as a result of reduced human security, either directly as a result of climate change's impact on states' ability to secure a population's livelihoods and human security, or indirectly as a result of reduced access to natural resources on which livelihoods rely. The International Committee of the Red Cross (ICRC)<sup>48</sup> provides an analysis of how climate change may be linked to violent conflict. They noted that climate change would not directly cause armed conflicts. Instead, the region's overreliance on rainfed agriculture and natural resources for food security and livelihoods, rapid population growth and poor governance have exacerbated the impact of climate change. This may indirectly increase the risk of conflict through existing social, economic and environmental factors. In other words, climate change is a threat multiplier and is not a sole cause of violent conflict.<sup>49</sup> The IPCC<sup>50</sup> notes that compared to other socioeconomic factors, the influence of climate on conflict is assessed as relatively weak because along long-term socioeconomic pathways that reduce non-climatic drivers, the risk of violent conflict will decline. It is, therefore, difficult to use a single explanation to account for the emergence, escalation and prolongation of any kind of conflict.<sup>51</sup>

## 2.7 Climate Change and Socio-economic Impact

Since climate change impacts ecosystems, infrastructure, livelihoods, food and social wellbeing, it has socio-economic consequences. DFID has documented a preliminary analysis of the impact of climate change on Nigeria's economy, noting that all regions have been impacted, but a higher impact will be experienced in the coastal region and the far north. The report estimates that climate change could result in loss in GDP of between 6 and 30% by 2050, worth \$100–460 billion. A summary of the impact of climate change in the Niger Delta reported in the literature is presented in Table 6.

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44 M. Burke, S.M.Hsiang, and E. Miguel (2015). Climate and Conflict. *Annual Review of Economics* <https://www.annualreviews.org/doi/pdf/10.1146/annurev-economics-080614-115430>

45 C.K. Butler, and S. Gates (2012). African range wars: climate, conflict, and property rights *Journal of Peace Research* 49, 1, 23-34. <https://doi.org/10.1177/0022343311426166>; C.S. Hendrix, and I. Salehyan (2012) Climate change, rainfall, and social conflict in Africa. *Journal of Peace Research*. 49. 1, 35-35. <https://doi.org/10.1177/0022343311426165>

46 W.E. Nafzige(2006). Development, inequality, and war in Africa. *The Economics of Peace and Security Journal* 1(1):14-19. DOI: 10.15355/epsj.1.1.14

47 Cited in N. Zabbey (2022).

48 International Committee of the Red Cross (9 July 2020). Seven things you need to know about climate change and conflict. <https://www.icrc.org/en/document/climate-change-and-conflict>

49 USAID (2007); A. Evans (2010). Resource scarcity, climate change and the risk of violent conflict, *Centre on International Cooperation, New York University*. [www.cic.nyu.edu/international-security/scarcity.html](http://www.cic.nyu.edu/international-security/scarcity.html).

50 IPPC (2022)

51 F.S. Ademola (2006). Theories of social conflict, in s. G.Best (Ed.) Introduction to peace and conflict studies in West Africa: a reader (35-60) Spectrum books limited.

**Table 6: Impacts of climate change on the Niger Delta**

Environment

**Flooding:**

Floods afflicted 800,000 people in 14 West African nations in 2007. Nigeria was hit by extensive and unprecedented flooding in the fourth quarter of 2012. The floods swamped a large portion of the Niger Delta and resulted in major social and environmental crisis.<sup>52</sup>

There has been a lot of rain lately, which has resulted in major floods and erosion. Many settlements have gully erosion sites, and farmlands have been badly leached or washed away, with low harvests recorded. This has increased the risk of hunger and malnutrition.<sup>53</sup>

**Agriculture and wildlife:**

Climate change impacts on food crop production.

**Salination** is caused by flooding and seawater intrusion into freshwater, resulting in the drowning of terrestrial and soil animals and the death of salinity-sensitive aquatic species. As temperatures rise, algal blooms in lakes have increased, allowing invasive species to thrive. Flooding of fishponds, particularly those near rivers or in floodplain farmlands, causes overflows and escapes of farmed fish.<sup>54</sup> In addition, increased temperature reduces oxygen concentration of pond waters. This would result to hypoxia and the death of cultivated fish.

**Water quality** and fish species in the region are predicted to suffer significantly because of a projected increase in water flows and rising sea levels. This will have a detrimental economic impact on communities because they rely on these water resources for livelihoods. Fishers in the region rely on the harvest of wild fish and the sale of fish for a living.<sup>55</sup>

The impact of climate change on farming activities indicates that farmers are experiencing stunted growth of crops and livestock, leading to poor yields.

52 C.A. Okoli (2014). Climate change and the threat of weather-related disasters in the Niger Delta. *Niger Delta Research Digest*, 8 (2).<https://www.researchgate.net/publication/345998895>

53 E.U. Ituen & A.F. Alonge (2009). Niger Delta region of Nigeria, climate change and the way forward. <https://www.semanticscholar.org/paper/Niger-Delta-Region-of-Nigeria>.

54 E.L. Molua, C.M. Lambi (2007). The economic impact of climate change on agriculture in Cameroon. World Bank Open Knowledge Repository. <https://openknowledge.worldbank.org/handle/10986/7362>; A.A. Idowu, S.O. Ayoola B. Ikenweibe, (2011) Impact of climate change in Nigeria. *Iranica Journal of Energy and Environment*. <https://www.researchgate.net/publication/228459699>; and Awosika (1995).

55 Ikehi (2015).

**Erosion:**

In low-lying coastal areas, such as the Gulf of Guinea coast, an increase in the height of the sea above the local mean sea level induced by global warming will worsen inundation, increase coastal erosion, and produce more temporary and permanent flooding.<sup>56</sup>

Coastal erosion is one of the most serious issues in the Niger Delta. The World Bank considers coastal erosion to be a modest priority in parts of West Africa. However, it is the most significantly manifested impact of sea-level rise in the Niger Delta region and should be given top priority. Erosion in the coastal region has resulted in the loss of settlements to the sea. Various oil wells have been lost to the ocean due to erosion in some areas, particularly in Forcados.<sup>57</sup>

Coastal erosion poses a significant threat to the Niger Delta. Some of the effects are: farmland loss, loss of household abode, depletion of human settlement along the coast, exacerbation of flooding, population displacement, loss of material assets (property and infrastructure), destruction of ecosystem, land degradation, ocean encroachment (surge and inundation) and loss of livelihood sources and support.

Poor governance structures can exacerbate existing grievances and social divisions, especially when there are pre-existing socio-economic, ethnic, or religious tensions. Fragile regions (e.g., the Niger Delta) face particular challenges in managing the negative social impacts of resource scarcity and the impact of climatic variability.<sup>58</sup>

The loss of means of livelihood grossly affect human security. Women and youths are particularly affected. This has encouraged resentment and a cycle of widespread protests that are often 'crushed' by the government. In certain situations, the protesting youths arm themselves to attack security personnel drafted to stop the protest or guard oil facilities. This connection between environmental decay, human security, and violent conflicts is worth investigating further in the case of the Niger Delta.

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## 2.8 Environmental degradation, climate change, insecurity and conflict in the Niger Delta

The empirical literature says there are linkages between environmental degradation, climate change, insecurity and conflict in the Niger Delta using oil pollution in the mangrove ecosystem as a case study. The Niger Delta holds the largest expanse of mangroves in Africa.<sup>59</sup> This unique ecosystem is essential for climate change mitigation and adaptation. However, the delta's mangroves are amongst the worst degraded in the world and they are fast shrinking.<sup>60</sup> For example, two major oil spills in Bodo

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56 Mensah, et al. (2017) cited in N. Zabbey (2022).

57 NDES (1997); Ibe (1988); Okoli (2014); World Bank (2019).

58 Ajala(2 016).

59 See Spalding (2010).

60 See UNEP (2011); and Zabbey et al. (2021) .

Creek killed 1000 ha of mangroves.<sup>61</sup> Nwobi et al.<sup>62</sup> estimated that between 2010 and 2017, the area covered by the invasive nypa palm in the Niger Delta increased by 600% (11,447) while the expanse of native mangroves was reduced by 12%.

Meanwhile, mangroves provide the coastal communities with numerous goods and services, including coastal protection against erosion and storm surges. A 1km<sup>2</sup> of mangroves is estimated to support fish production of 90 to 250 tons per year.<sup>63</sup> Healthy mangroves sequester five times more carbon dioxide than tropical rainforests. The World Bank's estimate of economic benefit of mangroves (considering flood risk reduction, fishing, and wood only) in Nigeria stands at US \$4,700/ha/year – nearly US \$3 billion/year nationally. Many of these directly benefit local communities. Loss of mangroves leads to biodiversity loss. It also leads to loss of livelihood opportunities, involuntary migration and desperate switch to unsustainable alternative livelihoods, including artisanal oil refining.

Maladaptation such as obnoxious fishing and artisanal crude refining further degrades the environment's resilience to climate change and mitigation. Loss of the fish production functions of mangroves would lead to food insecurity, malnutrition and poverty. At the same time, it means the function of protection against flooding and erosion which mangroves provide would have been lost. As a result, the near-shoreline or low-lying makeshift buildings that characterized some coastal settlements would be submerged by climate change induced flooding. This would further result in the loss of properties. A trap fisher for example, could maladapt to these situations by switching to dynamite fishing. This is a highly conflictive-insensitive method. The method is inconsistent with local fishing norms. It can lead to fighting between the user and other fisherfolks determined to preserve the local fisheries. Conflict arises when one party blocks what another party cares about.<sup>64</sup>

Increased food prices reduce household incomes and lead to health risks such as malnutrition and mortality with little or low levels of adaptation.<sup>65</sup> The resultant meagre income would not be able to support basic needs of victim families. Oil theft tapping points are generally owned by armed gang leaders who, in order to keep the cash flowing, would clash with other gangs or new entrants into the illegal enterprise. Katsouris and Sayne describe succinctly the links between oil theft and violent conflicts in the Niger Delta.<sup>66</sup> Involuntary migration of some of the impacted population to upland areas could lead to violent confrontation between the migrants and traditional landowners, particularly in cases when an inter-community dispute (e.g., a border dispute) exists between the sending and receiving communities. Climate change consequences, according to the IPCC, would cause various mental health issues, especially for children, adolescents, the elderly, and individuals with underlying health conditions. Mental illnesses could be drivers of violent attacks.

Multiple climate hazards occur at the same time, and multiple climatic and non-climatic risks interact, resulting in compounded risk and risks cascading across sectors and regions.<sup>67</sup> Impacts and dangers to health, the environment, infrastructure, livelihoods and food are among them. This requires a holistic and detailed multi-disciplinary examination.

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61 E. Gundlach (2018). Oil-related Mangrove loss East of Bonny River, Nigeria. DOI: 10.1007/978-3-319-73016-5-13

62 Nwobi, C., Williams M., Edward T.A. and Mitchard, E.T.A. (2019). Rapid mangrove forest loss and nipa palm (*nypa fruticans*) expansion in the Niger Delta, 2007–2017. *Remote Sens.* 2020, 12, 2344; doi:10.3390/rs12142344

63 P. Ronnback (1999). The ecological basis for economic value of seafood production supported by mangrove ecosystems. *Ecological Economics* 29: 235–252. [https://doi.org/10.1016/S0921-8009\(99\)00016-6](https://doi.org/10.1016/S0921-8009(99)00016-6).

64 Thomas, K.W. (1992). Conflict and negotiation processes in organizations. In: M.D. Dunnette and L.M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp.651-717). Consulting Psychologists Press.

65 IPCC (2022).

66 C. Katsouris, A. Sayne (2013). *Nigeria's criminal crude: international options to combat the export of stolen oil*. Chatham House Publication. [www.chathamhouse.org/nigeriaoil](http://www.chathamhouse.org/nigeriaoil).

67 IPCC (2022)

**Figure 4: Shoreline protection by complex architecture of mangrove roots**



*Source: Zabbey (2022)*

## **2.9 Climate Change Coping Strategies in the Niger Delta**

Adaptation to climate change, as conceptualized by IPCC<sup>68</sup>, means “adjustments in natural and human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities.” The IPCC’s Sixth Assessment Report articulates extensive adaptation measures for all regions. Adaptation may include the use of scarce water resources more efficiently. It may refer to adapting building designs to future climate conditions and extreme weather events. Furthermore, it may mean building flood defences and raising levels of dykes and the use of climate-smart crops. In addition, it may involve choosing tree species and forestry practices that are less vulnerable to storms and fire, and setting aside land corridors to help species migrate.<sup>69</sup> Nzeadibe et al<sup>70</sup> have suggested that adaptation to climate change in the Niger Delta requires the development of natural resource management strategies to ensure sustainable use of soil and water, halting biodiversity decline and generating renewable energy. Coping strategies in the region include smallholder farmers’ inter-crop planting of improved, climate-resistant cultivars, selected through indigenous knowledge.

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68 Intergovernmental Panel on Climate Change (IPCC) (2007) – the physical science basis contribution of working group I to the fourth assessment report.

69 Ibe (2017).

70 T.C. Nzeadibe, C.L. Egbule, N.A. Chukwuon & V.C. Agu (2011). Climate change awareness and adaptation in the Niger Delta Region of Nigeria. *Environment Development and Sustainability* 14(6):901-914. <http://dx.doi.org/10.1007/s10668-012-9359-3>



Etim and Etim<sup>71</sup> have identified crop diversification, conservation agriculture, and modification of planting seasons as some of the coping strategies. Similarly, Weli and Bajie<sup>72</sup> identified crop diversification, growing of early-budding crops, modification of planting seasons and change of farming locations as coping approaches. Other reported coping strategies in the region include relocating from flood plains, reconstruction of houses with reinforced materials, raising of houses, creation of artificial water channels for flood control, desilting blocked drainages and building of dikes using sandbags.<sup>73</sup>

Based on extensive literature analysis, Ibe<sup>74</sup> listed the following adaptation measures for Nigeria:

- Raising awareness among stakeholders about climate change and the need for adaptation.
- Formulation of a gender-sensitive national climate change adaptation programme of action that lays emphasis on ecosystem management.
- Ongoing assessments of the state of biodiversity, vegetation cover and land use.
- A national policy to slow population growth and stabilize it at around 2%.
- Encouraging the use of renewable energy.
- Ending net deforestation and encroachment on protected areas such as forest reserves, game reserves and national parks.
- Sustainable management of upland wetlands for the maintenance of water flow and quality, and the prevention of flood disasters.
- Coastal defence through the maintenance of mangroves and other coastland ecosystems to reduce coastal flooding and coastal erosion as well as provide livelihoods.
- Implementing land use zoning and control to keep development away from sensitive ecosystems, wetlands and flood plains.
- Whenever possible, incorporating green or nature-based infrastructure and technology into hard solutions to environmental problems to avoid ecosystem damage and maladaptation.
- Participating in the carbon market.
- Empowering communities by providing information on alternative livelihoods, facilitating cooperatives, providing micro-credit and other activities that allow them to take control of their situation.
- Maintenance of healthy and diverse ecosystems as a basis for adaptation to climate change.

Other suggested adaptation measures include<sup>75</sup>:

- Strategies that reduce food loss and waste or support balanced diets.

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71 N.A.A. Etim, and N.N. Etim (2019). Rural Farmers' Adaption Decision on Climate Change in Niger Delta Region, Nigeria in F. W. Leal (ed.), Handbook of climate Change Resilience, Springer.

72 V.E.E. Weli and S. Bajie (2017) Adaptation of root crop farming system to climate change in local government area of rivers state, Nigeria. *American Journal of Climate Change*, 6, 40-51. Doi: 10.4236/ajcc.2017.61003

73 S. Okocha, V.E. Weli; O.S. Eludoyin, M.N. Amadi, and G.T. Ariolu (2021) Community ccapacity and needs assessment to flood hazard in selected States in the Niger Delta, Nigeria. *Journal of Research in Environmental and Earth Sciences*, 7,10:45

74 2017.

75 See IPCC (2022); Olsson, G (forthcoming). Water interactions - a system view. Why we need to comprehend the water-climate-energy-food-economics-lifestyle connections. *International Water Association Publications*,

- Sustaining wetlands along the coast to protect against coastal erosion and flooding.
- Cooperation and inclusive decision-making with local communities and indigenous peoples.
- Adoption of urban greening for local cooling.
- Factoring in climate change impacts and risks into the design and planning of urban and rural settlements and infrastructure for resilience and enhanced human wellbeing.
- Investment in informal settlements, sustained monitoring and research.

Adaptation drivers, according to the IPCC, include:

- Supportive public policies
- Effective option
- Cultivar improvements
- Agroforestry
- Community based adaptation
- Farm and landscape diversification
- Urban agriculture
- Restoration of degraded ecosystems

Challenges of climate change adaptation in the Niger Delta are considered from the following angles:

- Financial
- Institutional
- Governance
- Policy constraints
- Poverty and inequity
- Lack of climate literacy

In summary, the vulnerability of the Niger Delta to climate change is exacerbated by a combination of geographical location, culture, increasing environmental degradation and poverty. Based on measurements of flooding and coastal erosion undertaken in the 1980s, the region was one of the first locations to feel the effects of climate change-induced sea-level rise. The present environmental problems are mostly due to maladaptation to climate change. This is undermining the region's climate change resistance, mitigation and adaptation capacity. It is also exacerbating vulnerabilities, risks and effects leading to insecurity and conflict. Hypothetically, there is a link between the loss of mangroves in the Niger Delta, climate change, insecurity and the potential for violent conflict.

Overall, existing adaptation measures are ineffective, poorly documented and not based on evidence-based research or policy. In order to reduce the number of victims of climate change in the Niger Delta and optimize resilience, there is a need to integrate community-led contextual adaptation mechanisms. Research on weather patterns and climate monitoring is critical. For example, re-launching flood monitoring stations on the Orashi River and other abandoned or non-functional sea level observing stations is significant. Climate knowledge and open data (open access) would help citizens adapt to climate change impacts, particularly in the highly vulnerable coastal Niger Delta. Investing directly in adaptation opportunities is of fundamental importance in the region.

## 3.0 Findings

The ten communities across five Niger Delta states and two in Togo, visited in this study, face severe climate change issues. Participants described their experiences and understanding of climate change with indicators such as unpredictable rainfall patterns, storms, floods, sea encroachment on land, sea-level rise and excess heat. They explained their skills in predicting weather conditions in relation to the practice of their main occupations of fishing and farming, one aspect of which is knowing the best time to set out to sea for fishing. Climate change is distorting this skill through unpredictable seasons such as the rainy and harmattan seasons.

Rivers State seems to be peculiar for its additional issue of deadly thunderstorms in the Bonny axis where participants narrated their experiences and expressed fears with their present situation of staying without working lightening arrestors. These issues have no direct link with violent conflict. Instead, they contribute to social, economic and environmental conditions of human insecurity that drive social conflict. The critical element is the indirect relationship between climate change, insecurity and conflict through the aforementioned conditions, and their role in the decisions people take on how they adapt their livelihoods to the impact of climate change in their communities.

The study found out that the process and the content of those decisions are laden with insecurity, together with actual and potential conflict. Climate-induced insecurity and conflict, therefore, refer to the visible results of response to the conditions created by climate change. The study, in addition, notes the role of the oil and gas industry in the conceptualisation of sources of the global climate crisis in terms of greenhouse gas emissions and pollution of soil, water and air in communities.

Conflict is pronounced on the family front between husbands and wives, within communities and between communities. Family conflict results from indirect impact of climate change on the ability of men to meet family responsibilities of providing upkeep. The growing failure of the fishing business and farming to generate sufficient income for locals means less income for families. This is leading to frequent friction between men and their wives. It is even instructive that weather conditions of excessive heat in an environment without electricity, sometimes make normal conjugal relationships at night difficult for husbands and wives, thus, resulting in quarrels.

In the Niger Delta, especially among the Ijaw speaking groups, women previously dominated practical traditional fishing and farming. They were more actively involved than men. Most engine boats currently used for deep-sea fishing are owned by women. This is one of the ways of adapting or coping with the problem of climate change for women who cannot always go nautical distances away from the community for fishing.

The menfolk who do most of the fishing these days with fishing boats that belong to women, face a serious challenge of regular conflict or disagreements with the owners of the boats for one reason. Boats with outboard engines are frequently stolen by pirates, whom one participant described as “invisible personalities” because they are hardly caught to pay for their crimes.

Fishers are often unable to replace lost boats due to a lack of insurance policies. Meanwhile, government security agencies are not effectively curbing or preventing the activities of these pirates. Climate-induced conflict and insecurity manifest through the constant struggle for scarce resources. The resort to crime, among many young people in the Niger Delta, as sources of livelihoods, is part of an illegitimate struggle for resources which create more problems for society. Piracy, kidnapping, illegal oil bunkering, deforestation (e.g., illegal commercial massive cutting of mangroves), and culturally insensitive and conflict-prone harvesting of periwinkles in communities are forms of criminal violence that relate indirectly to the problem of climate change. Togo's coastal communities are equally confronted with climate change issues that affect lives and economy of people in several ways.

However, they primarily contribute to human insecurity. Nevertheless, issues of human insecurity are conditions that point to conflict in a latent form waiting for an explosion in the future. Point however, is that the question of direct attribution remains vague and difficult to achieve in this study.

### 3.1. Akwa Ibom State

Okoroette and Ibeno where the study was conducted are coastal communities in Eastern Obolo Local Government Area of Akwa Ibom State. The local government has nearly 117,008 square kilometres total landmass and a shoreline of about 184km long. It lies between latitudes 4.53389° and longitude 7.76694°. <sup>76</sup> Fishing is the main occupation of the people who are mainly Ibibio and Ibo.

#### *Climate Change*

Participants displayed good knowledge of the local environment. Despite an initial difficulty, by some participants, in understanding climate change, further probing revealed their familiarity and experiences with the concept. Erosion, flooding and unpredictable rainfall patterns were highlighted as elements of the change. The participants further identified delayed harmattan seasons, coastal erosion, sea-level rise and excess heat as evidence of climate change.

#### *Social, Economic and Environmental Effects*

A total of 98 quotations were derived from transcripts of reports of focus group discussions and interviews in Akwa Ibom State with the help of ATLAS.ti, out of which 45, coded thematically under socio-economic effects of climate change, pointed to various ways in which communities have been affected (See Appendix 2). <sup>77</sup> Climate change poses existential threat to the sustainability of fisheries and farming. Interpreting the weather correctly was a local skill fisherfolks used to have decades ago when seasonal rains were predictable. The local knowledge of the direction of wind and water movement was useful to fishermen in guiding their decisions regarding when to set out for fishing. Participants argued that such knowledge has come under severe restrictions with seasonal rains becoming more and more unpredictable. In the same vein, fishermen were reported to be facing increased difficulties accessing the ocean to fish with communities continuing to experience more cases of sea-level rise. Similarly, unpredictable rainfall patterns have been described as distorting agricultural seasons and resulting in poor yields. Likewise, floods destroy houses, displace people and force some to migrate. These disasters have challenged the ability of ecosystems to maintain services that were previously trusted sources of food.

The resulting struggle for limited natural resources within the local population is one outcome.

Data obtained from Akwa Ibom shows that while many people are exploring other legitimate sources of livelihoods in the circumstances, some have resorted to crime. Clearly, climate change affects people in diverse ways including the following:<sup>78</sup>

- a) Effect on the culture of people, seen in the loss of interest in previously revered annual festivals which participants link to crushing poverty. For example, the Nwatam masquerade yearly festival has been put on hold for several years because of economic hardship linked partly to increasing difficulty in the fishing and farming occupations of the people.
- b) Destruction of houses by erosion and floods.
- c) Rising food insecurity due to poor yields from farming and fishing.

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76 Mapcarta.com

77 FGD Akwa Ibom State

78 Mfoniso, Antia. 2022. Akwa Ibom State case study: climate change, insecurity, and conflict in the Niger Delta, preliminary report from the field presented at Sense-Making meeting at De Palm, Port Harcourt on 5 May

d) Fish species extinction and migration to other waters.

*Coping Strategies*

Analysis of vast qualitative data from focus groups and interviews in Akwa Ibom State showed that many of the community people are not aware of their mitigation roles, but do know, and indeed, have taken steps to cope with the problem of climate change. While some are shifting from the fishing occupation to farming due to increasing low catch some of the fishers sail farther out for fishing as a good way to cope with limited results of fishing close to community. Regarding the battered shorelines, sandbags have been used to combat the erosion.

*Insecurity and conflict*

**Table 7: Some responses from participants to the question on climate change, insecurity and conflict in Akwa Ibom State**

conflict also comes in divers' ways
Our lands no longer yield good harvest
There is conflict in the society, community and families
Sea pirates will chase us to collect our engine in the river
Climate has caused a lot of conflict in our community
As the chief in the community, we were fortunate to catch two sea pirates
Yes, we have sea pirates and they are invisible
There are a lot of conflict in individual homes

**Figure 5: Focus group discussion (FGD) with community people in Akwa Ibom State**



*Source: Mfoniso Antia and Umo Isuaiko (2022)*

The description of insecurity and conflict in coastal communities in Akwa Ibom State highlights piracy as an element of climate-induced crime. Participants unsurprisingly described insecurity as stealing and killing in communities. Insecurity was further noted to be a situation where peace previously enjoyed has disappeared. Piracy is mainly responsible for growing feelings of insecurity among locals. This is not only for those who fish in high sea but also for travellers on waterways. When pirates steal boat engines from fisherfolks, the impact is transcendently negative on many. Sadly, participants made no attempt to suggest or even acknowledge the possibility that these pirates also include natives. Instead, they claimed that pirates come from distant communities to operate.

The relationship between climate change, insecurity and conflict is tricky. The impact is indirect in nature and manifest mainly at community and family fronts. The pathway of resource scarcity as a condition conducive to struggle for survival involves actors driven by interest. That condition also means economic insecurity that needs to be addressed. The increasing failure of local agricultural and fisheries practices to provide sustainable livelihoods for people, due in part to climate change, contributes to that condition.

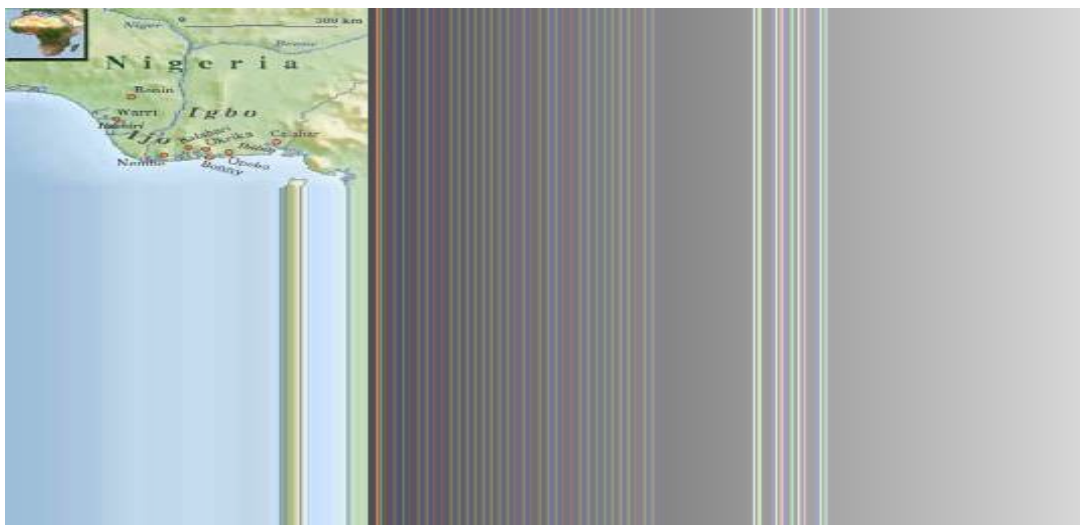
Piracy is the most pronounced crime in the analysis. It is a key element in the way some local people have adapted climate change issues to livelihoods in a negative way. It is part of the choices taken daily by young people as a way of coping with the economic hardship emanating from the declining fishing and farming occupations. The response to this has been different for different people. Peoples' specific choices and responses are responsible for the type of conflict that can indirectly be attributed to climate change.

The study notes the existential and potential criminal conflict between perpetrators,

government security and communities. Disagreements and disputes between boat owners and fishermen over stolen boat engines jeopardize the ability of both parties to live above the challenges posed by climate change. As one participant explained, “pirates are pursuing us to steal our boat engines”.<sup>79</sup> Pirates who steal fishing boat engines set in motion conflict for several other people in the fishing business chain. For example, families where criminal activities have crippled legitimate livelihood activities have suffered conflict at that level.

The social setting of people’s daily activities is fraught with conflict which climate change seems only to have exacerbated. Scarcity of resources is a normal experience for many who need to make daily efforts at securing food for their family. The family, as earlier noted is an important site for disputes between spouses who rely on the resources of the environment for their wellbeing. Climate change seems to have made disagreements more common in the form of family disputes. The data shows that the risk of insecurity and conflict is high though this has to be seen at the family and communal levels.

**Figure 6: Atlas.ti analysis of insecurity in Akwa Ibom State**



There is a general lack of security in Nigeria. Only God helps us with safety. I may say only in this month people are living with rest of mind. For more than five years, pirates have been stealing our fishing boats, sometimes on the high seas and at other times when we land our boats ashore.<sup>80</sup>

This description of the experience of a community person with insecurity and conflict in Akwa Ibom State suggests the indirect nature of the relationship between climate change, security and conflict.<sup>81</sup> The presence of unknown gunmen at sea where fishermen must look for their daily bread makes it an issue of insecurity and a potential source of violent conflict between communities. In some cases, community people have deployed vigilantes to arrest culprits. But this is usually not always a success for unarmed locals.

### *Recommendations*

Participants reported a need for the government to construct embankments on shorelines to check sea encroachment on the land. They also believe that the government has the

79 Community people and victims who participated in this study in the case of Bayelsa were somewhat afraid of openly talking about well-known pirates and other criminals during the focus groups discussions and interviews but displayed background anger and grievances that suggest that they would spare no opportunity in the future to play a role towards fighting the criminals.

80 Interview, Akwa Ibom

81 Interview, Akwa Ibom

primary responsibility to provide adequate safety for fishers and farmers currently threatened by pirates. This can be achieved by providing security patrol gunboats in strategic locations on waterways. The regular stealing of boat engines from fishers and the experience of travellers in creeks, with stealing of their personal belongings and kidnapping for ransom, can be checked with a better presence of government security working in partnership with local vigilantes.

Human insecurity issues relating to lack of basic social amenities such as hospitals, potable water, roads and the failure of agriculture systems in communities are matters of adaptation to climate change that need more attention from the government and non-governmental sector. The rest of the areas of policy intervention mentioned include: special attention to women economic empowerment, basic climate change education in communities to improve responsible and conflict-sensitive individuals, and community adaptation responses. It was also recommended that government at all levels make policy response to climate change more participatory with local communities playing more roles and having a voice on the effects of climate change and the adaptation measures required.

Finally, non-governmental and community-based organisations are enjoined to work to increase climate change education and advocacy in communities and engage the government for more community-oriented adaptation and mitigation measures.

### 3.2 Bayelsa State

The researchers visited Etieama, Agbakabiriyai and Igbetaewoama communities in Nembe Local Government Area (LGA), Bayelsa State. The State's eight LGAs are located on the coastline of the Niger Delta. Nembe has been studied by historians and acknowledged as one of the few cities in the Eastern Delta.<sup>82</sup> The cultural legacies of the people, including worship of snakes and periwinkles, as well as political organisation have been documented in the literature. The Nembe people are part of the Izon of the Niger Delta with fishing as their key occupation. As indicated in the map below, they are located along the coast of the region with the Atlantic Ocean as marker.

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82 Alagoa, E. J. (1964) *The small brave city-state: a history of Nembe (Brass) in the Niger Delta*. Madison



Figure 7: Map of section of the Niger Delta showing the location of Nembe



Source: <https://www.google.com/search>

The month of August has the greatest amount of rainfall, on an average of 14.1 inches.<sup>83</sup> The temperature varies between 72°F and 86°F and never higher than 89°F nor lower than 65°F as shown in Figure 8.<sup>84</sup>

When it comes to flood, studies carried out recently by experts revealed that the entire communities in Bayelsa State are vulnerable to flood at different degrees.<sup>85</sup> A participant is quoted to have described the 2012 flood as worse than all the impact of the six decades of oil pollution in the Niger Delta. The reason for the devastating impact of the flood is that Bayelsa State is the gateway to all the tributaries in the Niger-Benue rivers configurations. Thus, all the wastes and pollutants carried by the flood were washed into creeks, rivers and other water bodies in the State. Bayelsa is said to have the highest vulnerability index.<sup>86</sup>

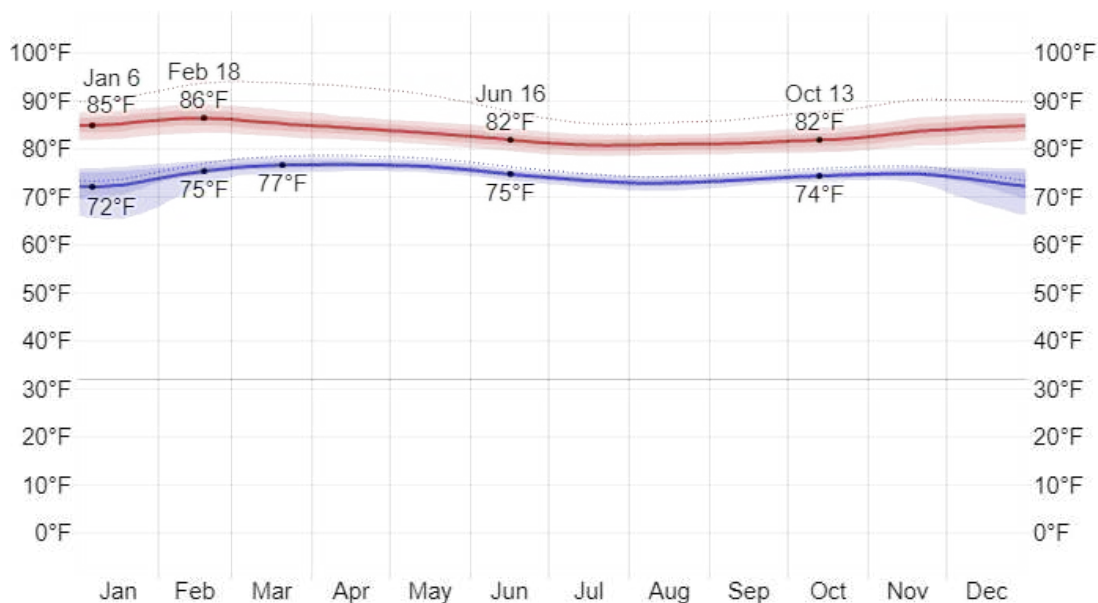
83 <https://weatherspark.com/y/52898/Average-Weather-in-Nembe-Nigeria-Year-Round>

84 <https://weatherspark.com/y/52898/Average-Weather-in-Nembe-Nigeria-Year-Round>

85 O.K. Berezi, A.A. Obafemi, and H.O. Nwankwoala (2019) Flood vulnerability assessment of communities in the flood prone areas of Bayelsa State, Nigeria. *International Journal of Geology and Earth Sciences*, 5 (3), 19-36.

86 Ibid.

**Figure 8: Average High and Low Temperature in Nembe**



**Source:** <https://weatherspark.com/y/52898/Average-Weather-in-Nembe-Nigeria-Year-Round#Figures-Temperature>

*Knowledge of Climate Change*

Climate change as the name implies is the change of climate from the normal way, we used to experience it. Nowadays, there is little distinction between the wet season and the dry season. There is a change in the climate. That is what I understand about climate change.<sup>87</sup>

This description of climate change is based on experience. Participants’ local knowledge and experience with climate change relates to their understanding of the seasons in recent times and what that means for economic and social activities. As far as they are concerned these changes are not good for communities. Coastal erosion, flood, sea-level rise, rise in temperature (hot weather), increased water salinity and unpredictable rainfall patterns are key issues with differential detrimental impacts on the people and their environment.

*Social, Economic and Environmental Effects*

In Akassa and Nembe, farmers and fishers face declining access to drinking water, fisheries resources and farmlands. These have fuelled internal struggles for alternative sources of livelihoods. The problem of climate change with indicators such as flooding, sea encroachment on land and erosion in these communities was perceived in participants’ shared sense of frustration with the environment as a long-term determining factor in the wellbeing of people. They blamed the oil industry for much of the problems they face regarding pollution but see climate change as a real source of worry, complicating oil issues and redefining choices people make concerning livelihoods. As one participant argued, “the weather is hot because of gas flaring.”<sup>88</sup> A lot seems to have changed in the daily life of the people regarding access to resources in creeks, rivers, forests, ocean and land. The changes were attribute to climate change. Like other locations of the study, participants lacked scientific explanations or knowledge of the cause of the changing climate but experientially narrated what has changed over time within the environment they live in, farm and fish.

<sup>87</sup> Interview with Chief Ereku, Secretary Buama Council of Chiefs, and public relations officer of Akassa Clan Council of Chiefs, Bayelsa State.

<sup>88</sup> Interview, Akassa, Bayelsa State, 24 April 2022

Many years for an environment with better ecosystem services where there is enough land for farming and enough opportunities for productive fisheries. They think of an environment that is without the crime now common in the creeks, with young men as key actors. Climate change has created a sense of economic insecurity that tends to put young people under pressure to take the way of crime as a matter of survival.

**Table 8: Key findings in Bayelsa State**

<b>Key climate change issues</b>	<b>Social, Economic and Environmental Effects</b>	<b>Coping strategies</b>	<b>Insecurity and Conflict /Nature of conflict</b>	<b>Policy recommendations</b>
<ul style="list-style-type: none"> <li>a) Delayed rainy season</li> <li>b) Limited rainfall</li> <li>c) Coastal erosion</li> <li>d) Sea-level rise</li> <li>e) Flooding</li> <li>f) Deforestation</li> </ul>	<ul style="list-style-type: none"> <li>a) Declining fish catch</li> <li>b) Lack of drinking water</li> <li>c) Displacement of people</li> <li>d) Climate-induced palm-wine and local gin scarcity</li> <li>e) Use of chemicals for fishing</li> <li>f) Low income for fishers and farmers</li> <li>g). Shrinking farming space</li> <li>h) Mangrove depletion</li> </ul>	<ul style="list-style-type: none"> <li>a) Migration to urban areas</li> <li>b) Practice of early farming</li> <li>c) Climate smart agriculture</li> <li>d) Crime such as piracy, kidnapping, and armed robbery</li> <li>e) Illegal oil bunkering</li> <li>f) Planting economic trees such as coconut and apple</li> <li>g) Massive cutting of mangroves</li> <li>h) Increasing the number of fishing nets for better chances of increased catch</li> <li>i) Changing fishing methods</li> <li>j) Logging</li> <li>k) Using chemicals for fishing</li> </ul>	<ul style="list-style-type: none"> <li>a) Family and communal in nature</li> <li>b) Human insecurity issues</li> <li>c) Criminality- piracy, kidnapping and armed robbery</li> <li>d) Mangrove loss-induced</li> <li>e) Climate-induced palm-wine and local gin scarcity</li> <li>f) Culturally insensitive conflict-laden commercial picking of periwinkles</li> <li>g) Disagreements between fishing communities overfishing zones.</li> <li>f) Quarrels and divorce in family over economic insecurity</li> <li>h) Disagreements between chiefs over massive cutting of mangroves</li> <li>i) Criminal violence between pirates and community vigilantes</li> </ul>	<ul style="list-style-type: none"> <li>a) Increase awareness on climate change issues through mobilisation and sensitisation</li> <li>b) Train locals on legitimate livelihoods strategies</li> <li>c) Embankments on shorelines</li> <li>d) Provide opportunities for skills acquisition for youth to boost self-employment</li> <li>e) Provide small grants and micro-credit facilities with low or zero interest rates to youth, women and men.</li> <li>f) Provide potable water</li> <li>g) Make climate policy formulation and implementation more participatory with communities incorporated in decisions about adaptation and mitigation</li> </ul>

The key areas of impact of climate change on social and economic life of people include shrinking space for farming due to coastal erosion. Other social, economic and environmental impacts include plant and animal extinction, destruction of mangroves, displacement of people, criminality, insecurity and conflict, illegal fishing practices and high cost of living. The people experience difficulty in coping with these impacts.

**Figure 9: A flooded community in Nembe**



Source: Jim Dorgu (2022)

### *Insecurity and Conflict*

Climate change creates human insecurity that leads, sometimes, to destructive conflict at the community and family levels. As reported, “climate-induced scarcity intensify competition for limited available resources which inevitably results in conflict.”<sup>89</sup> The effects of climate change include rising cases of piracy in the region currently making residents, transportation and general movement unsafe. This criminal dimension of insecurity includes kidnapping and massive illegal oil refining and marketing that is going on in the region. These crimes have brought locals into an occasional confrontation with government security agencies.

Flood and sea-level rise destroy natural sources of potable water and expose locals to water-borne diseases.<sup>90</sup> Access to water is an issue which locals are unable to address by themselves alone. They rely heavily on rain for drinking water, which is often polluted by illegal oil refining and gas flaring by multinational oil companies. Locals would cherish any assistance from the government to provide potable water. Internal migration of people due to flooding and sea-level rise leads to hazardous relationships among locals with consequences of violent conflict. As the food system continues to fail due to poor yields in fishing and farming, husbands are faltering and becoming unable to adequately provide for the upkeep of households. This has an impact on peace in families. The data shows the damage which this has on families, is in the form of marital conflict and divorce.

89 Bayelsa State case study report.

90 FGD in Bayelsa State

One dimension of the insecurity and conflict indirectly linked to climate change in the case of Bayelsa State is the resort to commercial periwinkle picking in the Nembe axis by non-indigenes who now arm themselves with guns to defend against indigenes. The Nembe culture prohibits sale of periwinkles. Potential and existential violent conflict exist between those bent on commercialising periwinkle picking and the Nembe community people who forbid such act.

On the other hand, a growing massive illegal cutting of mangroves for building works is causing conflict in the communities. Disagreements within the communities are based on the conflicting positions of actors. Some believe the activity to be a wrong business with negative impact on fisheries. Those perpetrating the business seem to be doing so as part of maladaptation of livelihoods to the effects of climate change. The disagreement is likely to escalate. In other words, whereas those involved, including chiefs and their proxies, see the new business as an alternative source of income, many rightly believe that it is not good for the environment. Traditional knowledge of the environment notes the value of mangroves for ecosystems. For example, many know the survival of mangroves is a blessing for fisheries and herbal medicine for the sick. Massive cutting of these mangroves, therefore, jeopardizes the long-term gains for the community.

#### *Recommendations*

The data suggests that it is important to increase the level of climate change awareness through community mobilisation and sensitization. In addition, the training of locals in legitimate alternative livelihood strategies is important. Also recommended is, the construction of shore embankments to check sea encroachment on land and provision of opportunities for skill acquisition. Access to grants and micro-credits with low-interest rate, especially for women, are equally needed. Finally, making climate change policy more participatory, with communities properly incorporated, would help in the formulation of legitimate coping or adaptation strategies.

### 3.3 Cross River State

The study was conducted in Esuk Mbak and Creek Town in Cross River State. The former (Esuk Mbak) lies at the latitude 4° 54' 11" N and longitude 8° 23' 11" E. It is in Akpabuyo Local Government Area of the state.<sup>91</sup> The community is renowned for a thriving trade by barter market that has existed since colonial times. Esuk Mbak is not only located sideways the coast of Kwa River, it is very close to the Atlantic Ocean and the Republic of Cameroon.

Throughout history, Esuk Mbak was a leading slave market port. It is believed that the barter market was once a slave auction market that shifted in direction when the slave trade was banned. The inhabitants of Esuk Mbak are mainly Efiks, with a few residents from the neighbouring state of Akwa Ibom. Farming and fishing are the traditional occupations of the people. The farmers specialize in the cultivation of cassava, maize, oil palms and yam. The fishing business includes the processing and distribution of fish. Lately, however, there has been some change in the local economy. Small business and transport (primarily by means of motorcycles) have become more common and widespread, contributing a significant share of the people's income.

**Figure 10: Esuk Mbak Beach**



*Source: Ken Henshaw and Peter Honesty (2022)*

In recent times, the Esuk Mbak people have made their living from trade in forestry products, including wood. The community is near a vast rain forest and mangrove from which lumber and firewood, respectively, were cut in recent decades. However, in 2008, the state government unilaterally imposed a ban on forest activities. This action was taken with respect to the prospect of financial benefits from the United Nations Reducing Emissions from Deforestation and Forest Degradation (UN-REDD) programme. With the ban, what used to be a taxed, legitimate economic forestry activities of the population, was stopped. The government established a militia-like taskforce to enforce the ban and went ahead to invite the UNREDD+ programme executing bodies. As a result of this singular governmental action, the economic fortunes of a large part of the community diminished.

Poverty rate rose significantly, and crime became an option for many. Recently, an armed cartel had emerged (not necessarily run by locals), specializing in illegal timber harvesting.

These challenges, have not reduced the value of traditional agriculture and fishing as key occupations of the people.

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91 <http://www.maplandia.com/nigeria/cross-river/akpabuyo/esuk-mba-4-52-0-n-8-24-0-e/>

The community beach remains a modest fish market where a handful of traders visit daily to negotiate and buy the catch of fisher folks. Though yields have decreased, fishing still provides reasonable income. The same goes for agriculture, where folks plant and harvest cassava, and process same into *garri* which they sell at the city markets.

Creek Town is a coastal agrarian community located in Odukpani Local Government Area of Cross River state. It takes approximately 20 minutes, on a boat ride, to get to the community from the capital city, Calabar. Just like Esuk Mbak, Creek Town has a long history of pre-colonial trade as a part of the Old Calabar Kingdom. Historically, Creek Town was a farm settlement, and has retained its nickname in that regard, *Obio Inwang* meaning 'farming settlement'.

The traditional occupation of the Creek Town people is fishing and farming. They specialize in the cultivation of cassava which they process and sell in Calabar mostly. Being predominantly coastal, the people also generate income from fishing activities. The fish is sold in Calabar either fresh or smoked.

Like Esuk Mbak, the state government's forest ban has equally driven the emergence of intensive logging activities in the states' forests, including in the rainforest and the mangroves which are routinely cut for its value as fuel wood. Other income generating activities in Creek Town include- petty trading and the distilling of raffia palm wine into gin, an endeavour the Creek Town people have become quite famous for.

### *Climate Change*

The data suggests participants in the two locations of the study in Cross Rivers State, Esuk Mba and Creek Town, understand the concept of climate despite limited exposure and education. They relate the concept chiefly to common environmental issues they have experienced. For the majority, their understanding of climate change comes from engagements they have had with non-governmental organisations that had carried out interventions in those communities in the last decade.<sup>92</sup> As one participant argued, "I know about the effects of erosion. This is also the effect of climate change."<sup>93</sup>

The main climate issues identified by participants in Cross River State include- erosion, unpredictable rainfall patterns, heat, strong wind, storms and floods.<sup>94</sup> The social and economic impacts of these issues are closely linked to the main sources of livelihood for the people such as fishing and farming. For example, farmers expect rain early in the year for planting crops because of their deep-rooted rain-fed agricultural practice. But this is no longer the case as they must wait for the rain too long these days. The implications include late planting of crops which in turn affects availability of food. The period between January and February is usually one for planting, whereas harvesting is expected in September each year. The alteration of this natural periods of planting and harvesting means poor yields, unemployment, and food insecurity.

Participants demonstrated knowledge of the changes occurring in their environment which implies local knowledge of climate change. The majority were, however, rather superstitious in their belief about the cause. As one attendee at FGD in Creek Town noted, "many of our people refused to worship *Ekpinoi* cult and that also caused hardship to us and climate change."<sup>95</sup> Heat, unpredictable rainfall patterns and floods have affected local economic activities. Fishing and farming, for example, have become much more difficult to yield financial benefits for the upkeep of families.

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92 K. Henshaw, and P. Honesty(2022) Cross Rivers State case study report.

93 *Interview with a community member, Esuk Mbak, Cross River State.*

94 FGD Creek Town, Cross Rivers State.

95 FGD in Cross Rivers State.

### *Social, Economic and Environmental Effects*

The community of Esuk Mbak reports erosion that has ripped away part of its agricultural land, destroyed a recently built road and threatened the only land access to its fishing port. They attributed this to the intensity of rainfall that produced much higher volumes of water and movements of rainwater. Large portions of the eroded land were once the farmland of a community member, as well as a palm grove. For them, the eroded road and adjacent lands represent a significant economic loss attributable to climate change, which increases in size and threat after each rain. If left unchecked, it could have serious impacts on the road to the community fishing port and a major source of their livelihood. The youth leader of the community argues:

The road was tarred before the erosion damaged it. Our farms have been damaged by the erosion. All our farms' produce was damaged by the erosion. The road is not accessible, there's white sand in the ground fine sand which is used for building. But there's no access to the land again because of erosion - no way to explore it.<sup>96</sup>

Climate change poses a threat to mangroves. Local knowledge of the importance of mangroves was demonstrated but many fishermen who even know this truth are involved in the destruction of the mangroves. They are active in commercial harvesting of mangroves for fuelwood to support families and as replacement for the fishing occupation they have abandoned because of very limited catch. Fishers reported alarming reduction in fish size and catch over the years. The immediate impact has been the steady decline in income. One participant argued, "...going into fishing...there is no fish again. I was a fisherman, and when you catch, you sell. But presently, you can't sell fish of five thousand naira."<sup>97</sup> Another participant argued, "yes, there's no big fishes in our river again, only small fishes exist in our river and it's affecting us badly." Community participants expressed the view that some species of aquatic life have long disappeared from the river due to climate change. A participant also complained:

Even our farmers cannot have a bountiful harvest from their farms due to this climate change. Even things like clams and prawns cannot be found in our sea again. Our seas have overflowed their boundaries. Things are not the same, in those days, the weather was favourable but now it's not.<sup>98</sup>

"We had lobsters in our river but not anymore", was how one participant explained the problem.<sup>99</sup> In the same vein, a participant stated, "in those days, we observe time, period, weather through the rising and setting of the sun. Now, there is no fish in our sea or river, our fishes have died or relocated to the high sea because of heat and climate change."<sup>100</sup>

Other species of aquatic life that have been lost include species of lobster that community people used for medicinal purposes, *Nkob*, *Unan* and *Imin*. There has also been a decline in shrimps. According to them, shrimps used to be available all year round, but now it only comes for a short period in the year. A popular wetland treat called *Nkorikor* is also said to have virtually vanished.

Participants reported radical shift in precipitation patterns. In their opinion, it is impossible to predict when the rains and the dry season will begin.

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96 Interview with youth leader, Esuk Mbak, Cross Rivers State, 20 April 2022

97 Interview with community member, Esuk Mbak, Cross Rivers State, 20 April 2022

98 FGD Creek Town, Cross River State, 23 April 2022

99 Interview with a native of Creek Town, Cross Rivers State, 21 April 2022

100 Interview, Creek Town, Cross Rivers State, 20 April 2022



As all agricultural activities depend on precipitation without any form of irrigation farming, their agricultural activities have become somewhat unpredictable. The fluctuations have also negatively affected crop yields. They also complained that some crop species no longer grow well on their farms, while some have completely disappeared. The participants shared their experiences, thus:

We usually plant our cassava by January and February and harvest by September., but now climate change has destroyed our system. As we cannot get new agricultural cassava stems so we are still planting the old cassava stems. During this late planting, the diseases usually attack our farm products and cassava stems.<sup>101</sup>The disease is really disturbing the cassava. Even mangoes usually bear fruits twice a year, in those days but ...The first one will mature from March the second one will start from April to May. Due to climate change cassava and corn normally get diseases due to the change in season and late planting. In the past, there was nothing like that.<sup>102</sup>

As I see, the rainfall is decreasing because we don't see rainfall as in those days.... The rain does not fall as expected, so when we plant our crops, it does not yield good fruits, the sun is disturbing our produce on the farm due to this change in weather<sup>103</sup>

In those days, we usually harvested the cassava you are planting now, there is no good harvest anymore. In Isong Inyang fishing pond, we usually plant cassava and harvest bountifully but now, there is nothing like that.<sup>104</sup>

In those days, we were having the rain during the normal period. Nowadays, this climate change has caused damage to our farms and fishing expedition in our community. In those days, we normally predicted where to stand in the river and catch fish but now those things are not there. These changes have caused our fish to decrease in our river, it is very hard to catch fish in our seas.<sup>105</sup>

Unpredictable rainfall patterns were suggested to have affected the productivity of oil palms. In Esuk Mbak and Creek Town, one of the major alternative sources of income is refining palm oil for cooking. Both communities have several palm oil mills for that purpose. Unfortunately, production has declined. This decline was linked to climate change.

Participants report a notable increase in sea level due to climate change. In some areas, this has led to the flooding of agricultural land and increased poverty. One participant noted: "in those days, we see people who are living at the riverside, they plant at the river bank but now, the flooding has taken everywhere. Another stated that "in Isong Inyang, on the coastal plains of the Kwa River, flooding destroyed farmlands, causing severe food shortages for local communities."

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101 FGD Esuk Mbak, Cross Rivers State, 23 April 2022

102 Ibid.

103 FGD, Creek Town, Cross Rivers State 24 April 2022

104 Ibid.

105 Interview, Creek Town, Cross Rivers State 22 April 2022

The community of Creek Town reports an unusual phenomenon with its body of water. According to them, there were two distinct local river springs in the community that had different tastes, one named Idim Etening, and the other, Idim Esa. It was easy to differentiate the two springs. Unfortunately, they have now merged and no one yet knows what that means relative to climate change.

Community members also reported an increase in storms and strong winds accompanying rainfalls. According to them, this is a recent trend. They link this indirectly to climate change. When the winds are strong, they sometimes destroy harvests and rooftops. In Esuk Mbak, strong winds were said to bring down commercial oil palms, causing destruction of means of livelihood.

Both communities reported significant temperature rise. This, in the form of excess heat, is a key source of worry, which the participants also believe may be responsible for the declining agricultural yield. They claim that the heat cooks the soil and makes harvesting of tubers more difficult. Participants in Creek Town reported that yam species called *Ndiaghi*, *Eko* and *Akpaha*, previously in abundance, no longer grow in the community.

**Figure 11: Participants in Esuk Mbak community in Cross Rivers State showing the size and quantity of fish caught after a long day**



Source: Peter Honesty (2022)

The decline in fisheries and agriculture, hence, was attributed to climate change. Shrimp, crayfish and several seafood products have become very difficult to find, while the size and quantity caught by fishermen, as shown in the image above, have declined. In addition, with the disappearance of the brown, pink, yellow and red clay, which locals referred to in the local dialect as 'oyo, bari, ufok, and oyeh,' respectively, a local architectural practise involving the decoration of buildings with the clay is no longer possible.

### *Insecurity and Conflict*

Participants did not expressly define their experience with climate change as a cause of insecurity and conflict but considered the impact of militant activities on fishing and farming. They were generally afraid to have that discussion. However, it is a problem that fishermen have always faced. Militants extort money and kidnap them for ransom, as well as steal their boat engines. The report notes also, in this case, that climate change is not a direct cause of conflict. Instead, it creates social, economic, and environmental conditions that foster human insecurity, predisposing communities, and individuals to primarily criminal, community and family conflicts. Insecurity and its potential for conflict come into play when people adapt their livelihoods or find alternatives due to the impacts of climate change.

Many young people, previously fishers and farmers, have taken to crime. While small-scale commerce, cycling, building local houses, small-scale livestock and poultry are areas some see as coping strategies. Many have remained in the fisheries and agriculture despite weak yields.

While the concept of insecurity was well understood by respondents, most were unable to make an immediate connection between climate change, insecurity and conflict. They agreed their incomes from agriculture and fishing have steadily declined over the years because of poor yields. This, they attributed to climate change but could not immediately say whether this is directly contributing to conflict and insecurity. Instead, they believe there has been an increase in insecurity and conflict in comparison to the past but attribute this to a decline in morals and culture of hard work. Participants rather gave an impression of community being peaceful and harmonious. This is because it is considered culturally unacceptable for any community member to give visitors the impression that the bond and peaceful co-existence existing in the community had waned. In the same vein, it is unacceptable to suggest to visitors that the community is facing insecurity and conflict, or even to imply that crime is common in their community. However, information sources, including civil society and law enforcement agencies who were also participants, showed evidence of the main conflict areas in the communities.

A relationship was found between climate change, insecurity and conflict. But the relationship is not direct. The relationship exists in how people attempt to adapt their livelihoods to climate change. Social, economic, and environmental conditions created by climate change touch on the livelihoods of people, predisposing them to conflict. Criminal activities such as piracy, kidnapping, armed robbery, illegal logging, and oil bunkering have specific nuances and actors. Contentions between fishing communities, farmers and fishers are common.

The role of militants and pirates is significant in understanding the nature of insecurity and conflict in Cross River State. Many of the militants and pirates were previously fishermen who later left for crime. For example, a young man, by the name, Simple Benjamin, a native of Creek Town, was a fisherman who left and founded the militant group, 'Bakassi Strike Force'. He recruited several fishermen into the group. Participants reported that the group is responsible for several raids on fishermen and community markets, stealing boat engines, fish, extorting money and compelling travellers to pay illegal fees in the Gulf of Guinea coastline.<sup>106</sup>

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106 Henshaw and Honesty (2022).

## *Coping Mechanisms*

Mechanisms adopted by the local population to cope with the effects of climate change, include driving of commercial motorcycles, collecting firewood, illegal logging, trafficking of children, livestock, skills re-training, migration, and crime. While some of these adaptation strategies are legitimate, others, such as, firewood harvesting and logging, pose significant threats to the environment. The massive logging and selling of mangroves put a lot of pressure on the mangroves. As things stand, crime is the primary coping mechanism for both communities. The main criminal activities include piracy, gang membership, armed robbery, militancy, and illegal oil refining.

The Cross River State government has banned purchase of forest resources from locals harvesting mangroves illegally. The purpose of the ban is to arrest mangroves depletion. The situation, however, seems to be deteriorating with some people resorting to armed and aggressive cutting for commercial purposes. Efforts by the government regarding adaptation include the provision of vocational training and business opportunities for youths. But these have not been regular or sustainable. Even the head of the Bakassi Strike Force was appointed Special Adviser to the governor on maritime security as a way of co-opting those benefiting from maritime crime into protecting these resources. The data shows that more needs to be done as none of these steps have yielded the expected results. It also shows that the problem is not so much the absence of policy but enforcement of existing ones to check these problems. As one participant argued,

There are several policies. There are so many policies. In fact, in Nigeria, in our State, in our communities, and even the rural areas (they) came up with simple policies of FMCs (Forest Management Committees); it is a policy at the local level, the microcosm of our entity. Who is obeying it? Who is keeping it? Even the chiefs themselves are illegal loggers.<sup>107</sup>

## *Recommendations*

- Government at all levels should take the issue of climate change adaptation more seriously by providing vulnerable communities with more opportunities to acquire training and resources for alternative sources of income.
- Government should plant mangroves to replace those destroyed or are depleted.
- Provide clean energy solutions.
- Provide climate education in coastal communities and basic social amenities to assuage impact of climate change on people.

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107 Interview with community member, Creek Town, Cross Rivers State, 24 April 2022

### 3.4 Delta State

The field researchers conducted interviews and focus group discussions in Ogidigben, Ajudaibo and Mandagho in Warri Southwest Local Government Area. These communities are culturally affiliated to the Itsekiri ethnic group. The temperature of the area ranges from 25.5°C to 29.5°C while rainfall varies from 20mm to 300mm.<sup>108</sup>

#### *Climate Change*

**Figure 12: Key climate issues in Delta State**



Erosion, rainstorm, unpredictable rainfall, hurricane, flood, riverbank erosion, excess rainfall and land sinking are key climate issues highlighted by participants in Delta State and supported by empirical literature.<sup>109</sup> Participants demonstrated shared experiences with climate change, noting its reality and how it is affecting the community.

#### *Social, Economic and Environmental Effects*

Climate change affects open sea fishing and has been linked to the extinction of fish species such as crayfish, usually caught in a particular season but now difficult to see. Participants attributed this to changes in the environment by implicating the impact of massive oil spills on mangroves, shallow creeks and general alteration of aquatic ecosystems.

108 O. Famous, W. Douye, P. Ere, and O.I. Emmanuel (2021) Climate change effects? Compelling evidence from data, farmers and artisans' perception in Warri, Delta State, *Nigeria, European Journal of Climate Change*, 3 (2), 11-19.

109 FGD Delta State

**Table 10: Climate change, insecurity and conflict, and adaptation in Delta State**

Communities	Climate Change Issues	Conflict and Insecurity	CC Coping Mechanisms
Mandagho / Ajudaibo/ Ogidigben	<ul style="list-style-type: none"> <li>- Unpredicted rainfall often comes with thunderstorms described as frightening and capable of damaging electrical gadgets. .</li> <li>- Unseasonal rainfall increases the intensity and frequency of flooding.</li> <li>- Rising sea levels induced by rainfall wash the community topsoil into a natural “ditch” behind the community, thereby exacerbating erosion.</li> <li>- Houses of about 10 years are sinking.</li> <li>- Gas flaring and oil spills are creating health and livelihood problems.</li> <li>- An estimated 100 metres of community land was lost to riverbank erosion.</li> <li>- The heat and chemical substances emitted through gas flare and oil spill (both from pipeline leakage and third party interference) are causing health challenges. Also, sources of livelihood in the aspect of fishing, farming, and bird rearing are phasing out as the land is no longer productive for such businesses.</li> </ul>	<ul style="list-style-type: none"> <li>- Food insecurity is building up rapidly, resulting from scanty fish in the river, crops dying before maturity, etc.</li> <li>- In few years to come, it is envisaged that people will overpopulate the upland area currently used for farming and will be competing for lands.</li> <li>- Confrontation with oil corporations (Shell and Chevron) over poor CSR.</li> <li>- Inter-ethnic conflict (Ijaw and Itsekiri).</li> <li>- Pilfering of waybill items has been observed by community persons. This is because of unemployment and low patronage for cargo and passenger services.</li> <li>- Artisanal oil refiners and pirates entice vulnerable persons at bear parlour with their display of opulence.</li> <li>- There is high rate of unemployment and poor educational system.</li> </ul>	<ul style="list-style-type: none"> <li>- Victims of riverbank erosion are given a place to rebuild shelters based on request made by community's oldest person.</li> <li>- Those whose livelihood is dependent on fishing sometimes do not want to relocate inward. As such, they run into conflict with other legitimate landowners at the riverbank especially when they raise new buildings without the landlord’s consent.</li> <li>- Houses built close to the riverbank are temporary structures although, the foundation of the buildings is well cemented.</li> <li>- Some persons living in the block and wooden structures were seen cladding the building with aluminium to make it water-resistant.</li> <li>- Community and individual efforts toward shoreline protection include the use of sandbags and woods to halt riverbank erosion.</li> <li>- Bailing of water after flood recedes is common.</li> <li>- Construction of detached funnel for the harnessing of rainwater for domestic use.</li> <li>- Some people use bio water filters to purify saline and rainwater for domestic consumption.</li> <li>- Fish and chicken are now bought from Warri and chicken is now more consumed instead of fish</li> <li>- Some community persons now breed cattle especially in Ogidigben .</li> </ul>

Prolonged rainy seasons seem to increase the chances of floods which participants claim have been very detrimental to economic activities and life generally in the communities. In their account of experience of rising sea levels and heavy rains, there were complaints of topsoil washing off into natural ditches in community forests. In addition, houses built over ten years ago are sinking gradually into earth probably due to soil subsidence in the area. The social science approach adopted in this study provides social data that shows perception of climate change by locals and the severe impact on community. An example of the impact is the infiltration of saltwater into freshwater swamps where locals have established modern fish farms due to decreasing opportunities for open sea fishing. This has resulted in poor fish yields and is affecting the earnings of those that depend on the fish farms for livelihood.

One key element among the effects of climate change in the case of Delta State is the sinking of buildings, where they are not washed away by erosion and flooding. This was highlighted and reported through the analysis of the effects of climate change with the help of Atlas.ti (see Figure 11).

**Figure 13: Word cloud of effects of climate change in Delta State**



### *Insecurity and Conflict*

Data suggests climate change is a significant factor to consider when it comes to conflict in Delta State. Like the rest of the case studies, this relationship is indirect. This adds credence to the complex relationship climate change has with conflict and buttresses further the need to see this relationship in context. "Climate change does not cause conflict in the community, the only conflict we have are internal community conflict due to leadership tussle."<sup>110</sup> This was how one participant described the relationship between climate change and conflict.

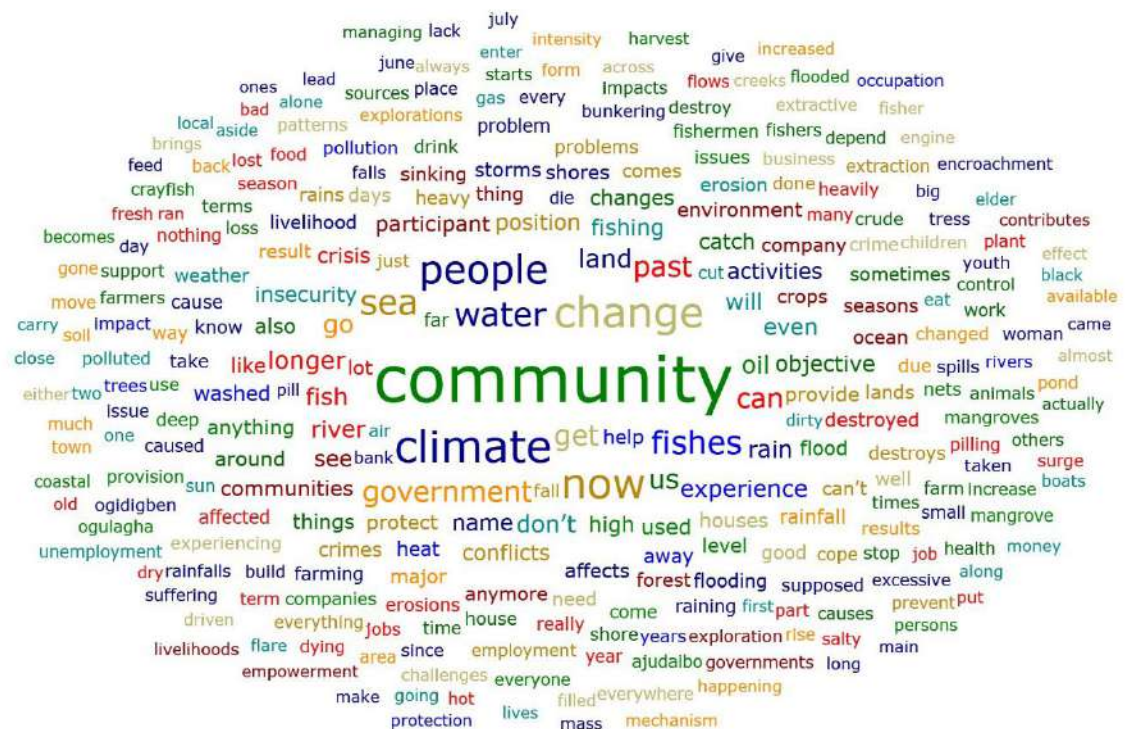
110 Interview with community member in Dela State.

The analysis shows embedded insecurity and conflict in the decisions people take in response to problems created by climate change. For example, rising food security issues, unemployment and poor agricultural and fishing yields are enough conditions for struggles for scarce resources. One participant argued, thus, “climate change does not cause disagreement in our community because we see it as a natural thing from God.” In a similar vein, a participant noted: “Community people don’t fight themselves over erosion issues or climate change. But if there are issues with companies, then we disagree about that. There are no land disputes as the land belongs to the community. So, when your house is washed away you move to upland.”<sup>111</sup>

This perception is common with many who would rather see the oil industry as the main source of insecurity and conflict involving community people and oil companies. For example, a participant shared that security operatives protecting the oil companies’ facilities are a major source of insecurity. However, it is instructive that human security issues such as food shortages provide the opportunity to understand the extent of the indirect effects of climate change.

Like in many coastal communities in the Niger Delta, criminal violence such as stealing and the illegal oil refining are rife. As one participant argued, “oil exploration has more impacts on us than climate change. Fishing activities have reduced but the little we have is better than none.”<sup>112</sup>

**Figure 14: Word cloud of data on climate change, effects, insecurity and conflict, and policy recommendations in the case of Delta State**



111 Interview with a community member in Delta State.

112 Interview with a community member in Delta State.



As the analysis in Figure 12 shows, the effects are many but mainly on the economic activities of locals. Their experience with erosion, for example, calls attention to the need for intervention. Solutions are mainly needed for adaptation but also much is being expected in places where oil companies and illegal refiners continue to pollute with oil spills.

The effects of erosion, flooding and house sinking create some nuances in understanding the presence of climate change. When riverbank erosion and flooding wash away houses, lead to displacement, or even make open sea fishing and farming difficult, multiple questions of alternative sources of income, health, livelihoods, human insecurity, and survival inadvertently are thrown up for answers.

### *Recommendations*

Among what the government can do in terms of adaptation and mitigation is to sand-fill depressed areas of the entire community and the bank of the river to protect the community from flooding. There is need for piling to protect the community. The government should also promote agriculture by supporting farmers with extension services and in taking action to improve the resilience of community to climate change.

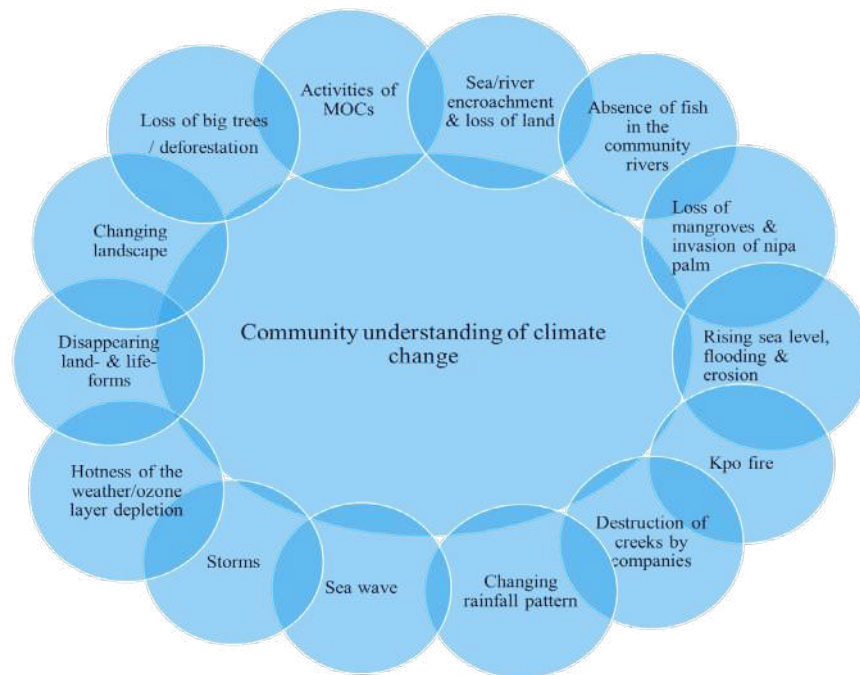
### 3.5 Rivers State

Finima (in Bonny Local Government Area) and Kono (in Khana Local Government Area), the study locations in the case of Rivers State, are coastal communities in the southern part of Nigeria. The Bonny River, shared with Kono, is a tributary of the Niger River, 10 kilometres (about 6 miles) from the Bight of Biafra. The Kono people are mainly farmers and fishers. Bonny is a coastal saltwater area of Rivers State with most of its inhabitants as fishers. A few of them are employees of International Oil Companies operating in the community. Some are farmers, though the land is increasingly unsuitable for agriculture. Others are involved in a variety of activities including working as civil servants.

#### *Knowledge of Climate Change*

Participants demonstrated significant knowledge of the changes occurring in their environment and reported ocean encroachment, erosion, sea-level rise, floods and extreme heat as key climate issues in the two communities. Finima is specifically the ring of thunderstorms. Their experience with environmental changes intersects with the role of the oil and gas industry. International oil companies and Nigeria’s national liquified gas company operate in Finima. As illustrated in Figure 15, Finima and Kono provide a sort of summary of the main environmental problems in Rivers State.

**Figure 15: Key environmental issue in Rivers State** <sup>113</sup>



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113 Rivers State case study report, climate change, insecurity and conflict in the Niger Delta.

**Figure 16: Oil facilities in Bonny (a fishing settlement lies just across the river)**



Source: Ogechi Cookey and Stephen Oduware (2022)

#### *Social, Economic and Environmental Effects*

Participants said that climate change has affected fisheries, mangroves, creeks, fishing settlements, residential areas, temperatures, landforms and livelihoods. However, they insisted that fishers and farmers are the hardest hit by climate change.

There has been a steady decline in fisheries. As one participant noted,

*Most of us who do crab, we don't get crab here anymore. Most of us who are fishermen here in Kono, when we want to have good yield, we don't stay in Kono here again, we must go, ... to the Atlantic Ocean for us to get what we want.<sup>114</sup>*

Not being able to bring enough fish back home from the river after spending hours each time fishermen go fishing has an impact on the price of fish. The women involved in the sale expressed their frustrations. Climate change affects all marine life of value to locals, including marine species like periwinkles, crayfish, crabs, and shrimps. The impact of climate change on mangroves and creeks translates into a restraint ecosystem service that impact negatively on fishing as an occupation.

The study notes the intersection of climate change and oil and gas exploration issues expressed by participants. Oil and gas matters are critical elements in the participants' narratives due to their existential and potential impacts on the livelihoods of community people. Illegal oil refining is pronounced as a thriving source of income for many young people. Fisheries, mangroves, and streams are among the victims.

The oil and gas sector is a confirmed source of greenhouse gases into the atmosphere. The fossil fuel industry has been implicated with contributing over 70 % of greenhouses gases into the atmosphere. These greenhouse gases are responsible for the global climate crisis. But it is also a threat to fisheries. This alone goes a long way in explaining its negative impact on climate change and the immediate environment of the people.

The Mongolo Creek in Finima is popular among community people for one reason. It was the community's only surviving creek and used to be rich in fisheries resources until climate change and oil and gas activities blocked its accessibility. One end of the creek is blocked by debris and

114 FGD, Kono, Rivers State, 24 April 2022.

sand bars, leaving no fish to entre at the time of the study.

Climate change is also affecting communities' mangrove ecosystem. Mangroves are being destroyed by coastal erosion and invasive plants such as the nypa palm. As one participant lamented, "there is nothing like mangrove again, water *don chop* all the mangrove, mangrove is finished, anything mangrove."<sup>115</sup> The general idea about the importance of mangroves is the role it plays as spawning grounds for fishes. Coastal erosion and nypa palms are strongly believed, in part, to be making this gradually impossible. Participants also linked this destruction of the mangroves to the blocking of the Mongolo Creek. Local knowledge reservoir also points to sediment trapping of upland erosion as one of the functions of mangroves.

On the other hand, the invasion of nypa palm has been tied to steady reduction in salinity of mangrove soil, leading to displacement of mangrove vegetation. As a study carried out in Eagle Island, Rivers State, by Numbere and Maimaijiang in 2019 concludes:

*Three Dimensional images (3D) were derived to show tree height. Result of mangrove forest 1 indicates that significant part of the mangrove forest was stressed because out of the VARI range of 0-1.93 (where 0=low and 1.93=high greenness) most of the forest fell below 1.0. Similarly, result for mangrove forest 2 show that in a range of 0-0.86 most of the forest fell below 0.5. This indicates that the mangrove forest is stressed by the presence of the nypa palm.*<sup>116</sup>

Similarly, a study of nypa palm invasion in the Niger Delta between 2007 and 2017, carried out by Nwobi, Williams and Mitchard also concludes that the mangrove forest is under threat from the invasion of the plant in the region.<sup>117</sup> Again, local knowledge of the impact of nypa palm on mangroves is supported by existing body of empirical knowledge as they rightly argued that the multiplication of nypa palms is a huge environmental problem hurting marine life and economy of the people. At Kono, mangroves are disappearing, excepting the protected area of the community where fishing is strictly regulated. As the mangroves dry up, the trees transform into fibrewoods to be harvested. One participant tried to explain the experience, regarding what could be contributing to the death of mangroves in the community by linking it to pollution from illegal oil refining. It means if oil bunkering is seen as a coping strategy of choice by people, the safety of even the protected mangroves in the community may last only a short time. This will further threaten the survival of fisheries in the community.

While the invasive nypa palm is causing a lot of inconveniences for locals, it appears it has no apparent economic value for them. It has destabilizing impact on rivers, as it occupies space and makes it difficult for other useful plants to thrive. Mangroves destroyed by nypa palm resonates in impacts through a chain that includes severe limitations in the opportunities that locals have for fisheries. They(mangroves) are one of the most visible biodiversity elements that are culturally and economically conceptualised in the local environment as key to survival.

Climate change extends this destabilizing impact to farms irrespective of size. Coastal erosion, saltwater inundation and flood are destroying plants such as plantain and cassava. A participant in one of the fishing settlements in the communities argued:

*All de cassava wey we plant for dia, wata don cari all. You see dis planten dem, na wata dey fall dem, dat salt wata, wen e don enta. Yes, as we dey for hia, if e enta naw, e dey rush dey com, dey rush dey com, so if na three days de wata wan remain, na so we go remain.*<sup>118</sup>

115 FGD in Finima, Rivers State, 23 April 2022

116 Numbere, A. and Maimaijiang, M. (2029) Mapping of nypa palm invasion of mangrove forest using low-cost and high resolution UAV digital images in the Niger Delta, Nigeria. *Current Trends in Forest Research*, 6, 1031. DOI: 10.29011/2638-0013.101031

117 Nwobi, C.; Williams, M.; Mitchard, E.T.A. (2020) Rapid mangrove forest loss and nypa palm (*nypa fruticans*) expansion in the Niger Delta, 2007–2017. *Remote Sensing*, Basel Vol. 12, Issue. 14. DOI:10.3390/rs12142344

118 FGD Kono, Rivers State.

Rising temperatures is another condition that has an impact on fisheries. As the temperature increases, the presence of mangroves would have been shaded zones for fish. One participant said:

*... a lot of us now train catfish. If catfish are exposed to too much sun as a result of climate change, they won't thrive as much as they would have done if we didn't have the problem of climate change. The same thing happens in the river because there is so much heat from the sun, and the atmosphere. So, you see them trying to run and scuttle - where will I go and hide? So, they run to survive. How many of these mangrove plants do we still have in the river? They are supposed to provide calmness or coolness to fishes and now you don't have them so much again. So, if you make fish run away from the area where they are exposed to dangers and climate change because there is so much heat coming from the atmosphere, it makes them run away from such areas.<sup>119</sup>*

In Finitasingi, sea encroachment has affected the few farmlands belonging to the people. They have moved inland three times, but still suffer from erosion problems that leave the community flooded with saltwater from the sea. The floods last days before receding a few centimetres. This experience is not typical of Finitasingi. Abalamabia, in Bonny, seems to have suffered more. The floods seriously affected the village's farms.

The combined impact of coastal erosion, flooding, sea encroachment on land and unpredictable rainfall patterns is severe. Before now, farmers were certain of the planting and harvesting seasons for various crops. For example, cassava, plantain, banana and cocoyam could be cultivated and harvested throughout the year. Yams were typically planted between December and March and harvested 10 to 12 months later, usually between September and November. Field responses indicate that farmers now have difficulty choosing the right time for planting and harvesting. One participant commented concerning the case of Kono, that farmers prior to this time would plant crops like yam, cassava, etc. in January in expectation of the first rains in the year. But this is no longer the case because the rains may not come as expected. One participant argued:

*I think, one of the major effects, is on the farmers, especially those persons whose farmlands are being taken away by the flood and, may be by water coming from these rivers in the community.... it's causing a lot of damage to the plants, to the crops on the farms... leading to so much loss for the farmers.... as a farmer, maybe you are planting cassava for instance and it's supposed to take up to a year. But because of this flood and water from the river, you know people tend to harvest this cassava prematurely, sometimes, five, six months, they look for a way to begin to up-root all of this cassava, maybe as a result of fear of the flood and of the water overflowing from the river.<sup>120</sup>*

Floods have a way of forcing farmers to harvest their crops before maturity. Crops like cassava can take up to one year to reach full maturity but are now harvested within six months of planting. This practice is in a sense a strategy for preventing complete crop loss. Despite this, farmers complained about losses due to plant decay, with the cassava being even one of the most vulnerable to destructive impacts of floods.

Some of the damaging erosion comes from the uplands in the case of Kono, where the land is largely low. It has a serious impact on roads and farms, making movement of persons and goods within the community difficult. According to one participant:

*...there are some farmlands, where before, the waters were usually very small, you have to walk through those, ... streams or lake to get to your farmland. But now, as it is, you go to farm in the morning and by the time you want to come back in the evening, the water you passed through that was maybe at your ankle is now almost on your chest.<sup>121</sup>*

With the evidence of declining crop growth and their unhealthy looks, the soils seem to be losing

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119 FGD Kono, Rivers State.

120 FGD, Bonny, Rivers State.

121 FGD, Kono, Rivers State.

fertility. It was generally said that harvests have been extremely poor and significantly reduced in size. No one could deny the impact of this on food availability and affordability. As a result, farmers are using more and more chemical fertilizers to grow crops, a trend that many believe flies in the face of previously successful rainfed and natural agriculture. In other words, it is a strategy that affects agriculture, biodiversity, quality and nutritional level of agricultural produce.

The data shows the town of Finima is a lightning zone in Bonny Island. Locals were regularly threatened by violent thunderstorms and flooding during high tide seasons, which they traditionally refer to as *Opumingi*. At high tide, the sea rises and leads to flooding. These climate events eventually forced the relocation of their forebears from their ancestral home to where Nigeria's liquified gas company is currently located.

The people were later forced by the federal government to relocate back to their ancestral home after several decades when the gas company was about to be located to where it is now. The presence of the company reconfigured the choices of locals regarding where to dwell amid the threats posed by thunderstorms, oil and gas activities. Royal Dutch Shell plc which recently changed its name to Shell plc, has 25.6% holdings, along with Total's 15%, ENI's 10.4%, and NNPC's 49 % in the gas company. The NLNG accounts for 7% of the global gas supply.<sup>122</sup>

Heavy rainfalls and sea-level rise affect communities differently. Participants bemoaned sea encroachment in Akiama, Bonny. At Abalamabia, floods cover the entrance to the community, making it impenetrable from that side. It destroys properties and fills people's homes whenever it occurs. Similarly, in Kono, erosion affects buildings. One of such buildings—a bungalow- is so badly affected that the occupants have reason to fear a possible unexpected collapse (See photo below).

One impact of climate change on mangroves is the loss of their protective capacities. Losses from coastal erosion and nipa palm invasion have made beaches, shorelines and living environments in communities vulnerable to erosion and saltwater flooding. In Bonny, the beach behind Finima National Park is receding. It has ebbed to the point where people from other communities, including those on Okada (motorbikes), can walk or ride through at certain times.

**Figure 17: A bungalow with a semblance of an upstairs building due to erosion in Kono**



Source: Ogechi Coockey and Stephen Oduware (2022)  
Stephen Oduware (2022)

**Figure 18: A settlement, Finitasingi, lost to sea encroachment in Bonny forcing the people to move in-wards to re-settle in a mangrove**



Source: Ogechi Coockey and

Participants' accounts of their experience further showed that since 1999 shorelines have receded inland in Finima by more than 2 kilometres and the phenomenon continues. A participant who made a YouTube video on the experience of an area on the island, called Light House, with the impact of coastal erosion in 2017, <sup>123</sup> argued:

*...there was erosion, erosion don chop our houses - more than forty-something houses. That time I put am for YouTube, Finima erosion.... I publish...nobody com, I call government, governor, president, Honourable Abiye then, nobody com answer us say una sorry, nobody does am till today as am telling you.<sup>124</sup>*

123 See <https://www.youtube.com/watch?v=dvTljzwIOAE>

124 FGD Bonny, Rivers State.

**Figure 19: Nipa Palm invasion in mangrove and marine ecosystems in Kono**



Source: Ogechi Cooney and Stephen Oduware (2022)

Like the other states in this study, climate change in Rivers State affects the livelihoods of people in communities in a variety of ways. Being mostly fishermen and farmers, issues such as already mentioned, including sea-level rise, flooding and invasive plants have had impact on the integrity of ecosystems. Impacts on mangroves, streams, farmlands and crops cumulatively affect livelihoods opportunities for locals. Analysis of experiential narratives on this issue shows, for example, that the harvesting of periwinkles and other seafoods such as oysters, lobsters and crayfish have dwindled. Such resources, previously abundant in streams and rivers, have become scarce. Consequently, fishing activity in the communities has declined. Participants reported that for many fishers, this has meant discarding the old methods of the use of canoes and fishing gears such as hand nets for harvesting fisheries in nearby creeks.

They fish as far as the Atlantic Ocean or on the high seas. This comes with a lot of risks including exposure to attacks by pirates. Even so, there is no guarantee of a good catch. The distances they now go to fish require engine boats which are expensive to purchase. According to a participant, “without engine boat now, you can’t go fishing, and to get one engine - one engine! one point one million, seven hundred thousand, two million - one point two (in Naira) before you go (will) get engine.” Meanwhile most of the fishermen have no way of easily raising enough money to buy a boat with outboard engine without a loan. This situation has left some at home with no source of income.

There are also issues of destructive sea waves breaking boats and erosion carrying away fishing gears, boats and nets. This creates additional hardship. As one participant shared: “all *de* (the) nets *don loss finish* (have been lost) ...*den my own na* two boats, *e don loss finish* (I’ve lost two boats). Na yestaday I go boro anoda boat (I just loaned a boat yesterday) ... *Naw we dey for suffa*, if you *hia* world of *suffa wey we dey for hia* (we are suffering here).” This is Nigerian Pidgin that translates as fishers experiencing hazards caused by dangerous waves leading to losses of boats and nets and leaving victims helpless.

The fishing occupation has a chain that includes retailers who are mostly women. Depleting fish catch and all the issues highlighted threaten to make them jobless. Even those who farm catfish as a coping strategy are not left out, as hot weather conditions are said to affect the growth of fish. In such a situation, fish would be difficult to attract good sales.



### *Insecurity and Conflict*

The communities studied belong to the category that can be said to be relatively peaceful in the Niger Delta, by the assessment of participants. However, both conflict and insecurity are pervasive. No community can be regarded as conflict-free – some participants understood this - if conditions of injustice such as poverty remains a crushing feature of the daily life of people amid massive industrial extraction of oil and gas. The absence of physical violence and presence of poverty is what Johan Galtung refers to as structural violence. Participants perceived their communities as peaceful compared to those in other parts of the Niger Delta and Nigeria as a whole.

Natural disasters in these communities have created conditions of poverty, lack and other forms of insecurity that serve as drivers or enablers of conflict. But participants understood insecurity primarily as the activities of cultists and the operations of sea pirates. Petty-stealing, burglary, political clashes, and other conditions that make one feel unsafe were also understood as insecurity. One participant saw a person's inability to eat due to loss of livelihood as a case of insecurity, particularly food insecurity.

They saw conflict and insecurity as closely connected, and the former as a forerunner to the latter. Some saw conflict as disagreement and one participant rightly understood conflict to be neither good nor bad. Insecurity was generally better understood than conflict because the term "conflict" had to be eliminated before some members of the community could share their experiences.

There were complaints of pervasive cultism in the land. Rival groups such as 'dey gbam' and 'dey well' were seen by participants as nuisance in the communities. Several participants narrated how issues that could easily be resolved peacefully escalated to the point of killing due to the presence of cult groups. Such killings would trigger chains of retaliatory violence. Most participants related increased interest of youth in joining or starting a cult group to the inability to find a means of earning legitimate income.

For some, insecurity in the area should be blamed on oil and gas industry activities. The Mongolo creek, currently blocked from one end with sandbank and wreckages by oil companies, previously provided economic benefits for the locals. Blocking the creek means some of community people who previously depended on the creeks and the redundant barge landing jetty for survival, would have to look for alternative means of survival – which includes becoming perpetrators of insecurity

Most of the experiences shared regarding insecurity concerned encounters between fishermen and pirates. We found that these encounters were well known to the fishing and non-fishing community people. Participants described how pirates operate. They look for fishermen and travellers at sea to steal their engines and catch. Sometimes they beat and force them to jump into the water. Sometimes, pirates of the sea kill their victims. One participant recounting the encounters between fishermen and pirates of the sea said:

*Now no fish close-by again. And naw also, wia we dey go get fish dey far, without engine you can't go get fish. And also naw too, things done change in a way that fisherman will suffa loan moni... go buy engine, all these cult boys, sea pirates don com out, every day, dey will carry flying boat burst out, collet your engine, beat you put inside, if you done fishing before dey come beat you, dey go collect your fish. Dey no care how you go take go reach ground, you go dey for the sea if na two days, three days. All dese things no dey happen before.<sup>125</sup>*

From the comment above, the participant relates the encounters of the fishermen with the sea pirates to the lack of fish in their immediate waters. Another community person shared how sea pirates gave fishers a hot pursuit on the sea and the fishers ran, navigating the rivers and adjoining creeks until they (the fishers) found themselves in another community. She narrated thus:

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125 FGD Bonny, Rivers State.

*All our engine dey don collet am finish ooo. You see dis one (she pointed at a fellow fisher), since dey don carry go sea, no be today, na naw I go collet am ooo, dem dey escape dem, dey escape dem so teey dey carry go put for anoda kuntry, na anoda kuntry dem carry com naw, for two months naw. Naw dem (the sea pirates) dey send letter, sey make we no enta riva again if we no com pay dem moni. Anoda problem be dat ooo. Una no hear from Finima? Anoda problem, three days be dis, no boat wey from hia enta riva. If na dat one ooo, I think sey if I talk I go fall law ooo. Dis one dey don collet engine, dis one dey don collet engine (she pointed at the various fishers standing close to her during the interview). Na so we dey, one wey I get, dey wan com collet am, na em dey escape go enta Oyorokoto (another community), na dia dem dey carry de engine go. See eeh, we dey for world of suffa for hia, de pipol sey na dem get riva, make we no enta. Wata dey do em own, crude oil dey do em own, thief dey do em own. Dis thief own na em bad pass ooo.*<sup>126</sup>

In the last sentence expressed in Nigerian Pidgin, the participant cited three interrelated issues responsible for their sufferings – sea encroachment (“*water dey do em own*”), crude oil pollution (“*crude oil dey do em own*”) and criminal elements/sea pirates/insecurity (“*thief dey do em own*”). The last sentence “*Dis thief own na em bad pass ooo*” shows the issue of sea piracy as the most disturbing aspect of insecurity. Another participant told how the pirates, on the interception of fishermen, give them the options of giving up their fishing tools and fish or their money. Nevertheless, the study community acted by establishing guards to control pirate activity, especially in Kono.

We note participants’ linking of climate change to dying vegetations and mangroves as pathways to insecurity posed by criminal and illegal economic activities such as oil bunkering. For example, one of them argued:

*You can link them (insecurity and climate change). For example, the one on the sea, they are doing that because, these days, because of what is happening, you can now see a lot of in-roads on the sea so that when they do it, they have places to run to. For example, this kpo-fire (illegal refineries), you can see the level of devastation this thing is causing. Before these things (the vegetation) were knitted. Before, when you carry person sef (when someone is kidnapped), where are you going to take the person to? There is no opening. Everywhere was stock up by thickets. But today, a lot of clearing here and there in the middle of the forest. So, they can easily do anything and walk away with it.*<sup>127</sup>

In a similar vein, one participant narrated how the vanishing of a beach provided criminals with access into community to steal from villagers. They use bikes easily on the beach to reach their victims. To mitigate this problem, the Nigerian Navy was invited to build their station in the area.

Climate change relates to conflict in specific ways, mostly within the social setting of communities. Researchers met a typical case at a fishing settlement where a quarrel was brewing between two residents over defecating close to residential buildings. Sea encroachment has compounded the poor sanitation situation in the communities. In this case, the story was told of how one resident who picked a quarrel with a neighbour for lack of where to defecate did it openly close to her residence. The stench was disturbing, but many other residents sided with the person who committed the act because of the shared sense of threat. She explained:

*... naw I dey told dem to stop dose tins dem (that is, to stop defecating there). If you pass hia you no fit breath oh! Yes, na him dat boy carry him wife com dis morning sey me I be witch sey him carry him pikin dem put for my neck tell me I no gree make dem dey go shit for hia. Jehovah Elshaddai! The time wey we com hia, we no dey do all dis tins.... you go hia som odour naw, as you dey stand (she prepared the researchers for whatever smell that may likely come from the area where people now defecate).*<sup>128</sup>

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126 FGD Bonny, Rivers State.

127 Interview Bonny, Rivers State.

128 Interview, Bonny, Rivers State.

This was a clear case of conflict within the community resulting from shrinking physical space for social and private activities. The participant noted that such problems leading to conflict were common. The growing desire among locals for relocation or what can be better described as displacement is linked to sea encroachment. Desire in community people, of the class of the uneducated, for employment even as cleaner in the company operating in the community was observed. Fishing is no longer attractive to some community people. The experience of a widow who lost her two sons to piracy at sea underscores the problem (See photo below).

**Figure 20: A fisher's widow whose two sons went fishing but never returned and are suspected to have been killed by pirates**



The data showed land sharing was a major trigger of conflict in the community. According to one participant:

*Land sharing, for people to co-exist, most times, you see somebody else that is now like a refugee – moving – has been forced to leave their initial settlement. Because, I remember one time, as a young child there is this Bonny village, I think it's just the last village, Inyoba-Ama, shares boundary with Ataba (in Andoni). So, they were having issues, lots of issues, communal issues, because the closest community to them felt, ah you guys are not from here, it's as if you are Bonny people. What are you doing here? It's as if you have come to grab our land. They are always having issues.*

This is a case of communal or inter-community conflict. The leadership in Bonny tried to resolve the conflict by offering relocation of the *Inyoba-ama* family but they refused the offer. The conflict has continued to escalate. According to a participant,

*So, until today, as I speak to you now, it's like a desert. The last time I went there, there is no school for the children. Most of the houses have been vandalized. They keep going there to kill old people (in Inyoba-ama). In fact, there are no young people in that community anymore. It's just the very stubborn ones that have refused to relocate that are still there and every day, they keep having issues.*

In Light House, after the destruction of houses by sea-level rise and erosion, the people went to the chief, angry, crying for help, although they later understood it was wrong to blame the chief for the disaster. But those were emotional conditions conducive to conflict through a possible transfer of aggression in the community if the chief or any other groups had reacted badly.

We also heard that conflict results from flooding of farms, particularly when a farm owner tries to create a path for the floodwater. This process is laden with conflict because creating the path

to drain floodwater is usually through some other person's farm. Many such neighbours would frown at and sometimes put up a fight or resistance. According to a participant:

*Even the farm wey we dey farm, if dis person get farm hia, you, you get farm hia, wen we enta raining season you sey hia wata dey, you wan pass tru dat person farm, you go dig small hole for em own farm so dat wata from your own farm go dat side go wia em go settle, em no go gree make you dig de small drainage pass for em own farm so dat you your crop no go get de problem. If en no gree make you dig am, den de rain coms to settle your farm, e don already spoil your crop, he don spoil your cassava, so all dos tins dey cos conflict, e dey cos problem.*

Stealing is one part of the results of conditions left in the aftermath of devastating disasters such as floods, with many farms affected. Damaged crops leave many farmers in hunger and tend to encourage stealing.

Communities appear to have a system for managing conflicts arising from displacement, and encroachment on land by the sea. Many participants in Bonny mentioned the current chairman of the local government as being very active in combating insecurity and illegal oil refining in the area. But conflicts are mainly handled by chiefs. This was even clear with a group that came to meet a chief participating in the study for his intervention in a conflict.

Clearly, a relationship between climate change, insecurity and conflict exists also in this case, but this relationship is indirect. Instead, both insecurity and conflict occur at the point or in decisions taken by victims of climate change about adaptation in the context of livelihoods. The study notes the key actors in climate-related insecurity and conflict to include fishers, farmers, multinational oil companies, artisanal oil refiners, sea pirates, cult groups, community chiefs and leaders, local government chairpersons, CSOs, NGOs and Security agencies (the Nigerian Navy for example).

#### *Coping Strategies*

Although climate change mitigation and community adaptation capacity may be seen as nascent and limited, community people are taking actions to reduce the impact of climate change on them. For instance, in Kono, they were found to be using some landscaping measures against erosion to save their houses from collapse. They appeared to be using floodproof surfaces such as submersible planting, especially vegetation patches to reduce surface runoff flow velocity.

**Figure 21: Submersible plants as a measure against flood in Kono**



They are seeking ways to adjust their livelihoods to climate change although some of the strategies have negative impacts on their environment, soil and the livelihood they try to sustain. One participant stated, “we change the way we plant. Sometimes ago, we allow the farmland to stay for seven years, but this time, three years. We add fertilizer to cope up.” Fertilizers were previously not used on the farms, as a participant recounted.

The practice of good neighbourliness exhibited, for example, by sharing fish caught on certain days in Finitasingi seems to be a good one for assuaging the social and economic impact of these problems on the life of people. In addition, fishers in Bonny can join unions for the purpose of seeking collective welfare through a collective voice. Also, this way they can better communicate their challenges to authorities though this has not been very effective.

In Kono, fishing in the Winua Reserved Mangrove Area is regulated and mangrove trees are protected from those who may want to harvest in the area. Similarly, the Finima Natural Park in Bonny is a protected area where community members are not permitted to enter and hunt wildlife. Again, it is unclear whether this protected area will be beneficial to the livelihoods of those hit hardest by climate change. In addition, lightning arrestors have been installed in Finima though the people showed lack of confidence that they are fully protected from lightning strike as the functionality of the arrestors is doubted.

Bonny Local Government authority is said to have begun demolition of houses built on roads to create paths for floodwater. Likewise, Kono community leaders undertook demolition of houses for the same reason, to create pathways for floodwaters. Shoreline protection measures have been taken at Bonny Beach to prevent water encroachment. The federal government is constructing the first road that links the Island to the rest of the state – the Bonny-Bodo Road. Stakeholders (including NLNG) are supporting this with a well-designed and suitable drainage system.

Overall, participants were unaware of the policy response and framework of government to climate change at the community, national and regional fronts except for a few participants whose views centred on the lack of implementation/effectiveness of available policies.

### *Recommendations*

Participants called on the government to take action to improve the economic situation of the population, manage the problem of climate change and ensure better security. They encouraged collaboration between fishers and the Nigerian Navy to address the threat of sea piracy through the positioning of multiple gunboats on waterways. Their proposition was that fishers are more familiar with the environment and would know exactly where gunboats should be positioned. Fishers may have these details because of their regular encounters with the pirates of the sea.

To tackle the problem of erosion, sea-level rise, storms, floods and unpredictable precipitation, community recommendations included:

- provide shoreline embankment/protection
- de-silt/dredge silted creeks
- relocate affected community people to new settlements
- protect forests from unregulated logging
- stop people from building on water pathways
- plant trees/windbreakers

- plant and conserve mangroves
- stop gas flaring
- create tracks or mini drainages to channel floodwater in farms into rivers or bigger drainages
- reclaim land
- invest in agriculture; and
- provide early warning systems and response strategies.

Recommendations made for the prevention of conflict resulting from climate change at the community, local, state, national and regional levels included:

- strengthen community-level leadership through regular conflict management training and establishment of proper conflict management systems
- educate and train young people
- create opportunities for employment and empowerment.

For preventing climate insecurity at the community, local, state, national and regional levels, the recommended solutions are:

- Position gunboats in strategic places on waterways targeting sea pirates and protect fishermen and common people
- fishers and the Nigerian navy should collaborate to combat sea piracy.
- community-based policing
- Have security presence in, or near, communities.

### 3.6 Togo

Togo's coastal zone is the centre of many economic and cultural activities involving other countries in West Africa such as Nigeria, Benin, Ghana, Burkina Faso, Mali and Niger. The road linking these countries with Togo offer several cross-border opportunities. With a large coastal zone more than 200 nautical miles offshore and 50 km inland, Togo boasts of being a significant player in maritime activities with a total of 1,967,000 inhabitants on a surface of 6,395 km<sup>2</sup> with an average density of 308 inhabitants/km<sup>2</sup>.<sup>129</sup> The coastline represents around 11% of the national territory and houses 42% of the Togolese population and 63% of the urban population. The zone is where oil and gas companies, the refinery, phosphate mining and electricity provision and distribution, among other organisations are located. Fisheries and agriculture, however, are the key economic activities of people in the zone contributing significantly to the country's gross domestic product.

The Togolese barrier beach is affected by the phenomenon of coastal erosion. Due to its geographic location between the Atlantic Ocean and Lake Togo in the south of the Mono transboundary biosphere reserve, it offers several touristic, economic, cultural, social, and scientific services to only name few. This justifies why it is privileged and coveted.

#### *Climate Change*

The climate change issues in Togo's coastal zone includes sea-level rise, coastal erosion, increased temperature, limited rainfall, and intensifying ocean waves. Participants discussed their experience with these issues, expressing their understanding of the phenomena.

**Figure 22: FGD in Doevi Kope, Togo**



129 Atanle, K., Bawa, L.M., Kokou, K., Djaneye-Boundjou, G. and Eдорh, M.T. (2013). Seasonal distribution of phytoplankton according to the physicochemical characteristics of Lake Zowla (Lake Boko) in Southeast Togo: the Case of the dry season and the long dry season. *Journal of Applied Biosciences*, 64, 4847-4857. <https://doi.org/10.4314/jab.v64i1.88474>





area (6557.33 ha) by the year 2070<sup>131</sup> Click or tap here to enter text.. Coastal erosion in these communities and the silting up of Lake Togo impact on fishery resources and promotes pollution.

#### *Insecurity and Conflict*

As to whether and how climate change contributes to insecurity and conflict in study sites, the data shows that conflicts are still latent. The report described the risk of insecurity and conflict in context of the most pronounced climate issues of sea-level rise, coastal erosion, increased temperature, limited rainfall, and intensifying ocean waves as “hidden.” Fishers’ experience occasional non-violent clashes with foreign fishers from Benin Republic. Fear is a major factor in insecurity among fishers and farmers. Fear of the unknown is an important element of insecurity. The profound impact of climate change on soils, swamps, rivers, forests, mangroves, and air was reported as a source of concern, fear and insecurity with enormous potential for conflict. Furthermore, the presence of pirates on the high seas, though just emerging has been seen as a future existential threat to peace in communities.

While climate change can only be seen as a potential trigger of conflict, the extractive industry with oil and gas, phosphate and other mining activities pose existential threat to peace in the coastal communities of Togo. For example, there is a continuing conflict between the community of Kpere and a phosphate company over non-compliance with corporate social responsibility agreements.

#### *Coping Strategies*

There seem to be very limited options regarding coping with the impact of devastating floods, erosion, mangrove depletion, unpredictable rainfall patterns, and extreme weather events on small-holder farming, fishing, hunting and livelihoods of the people. Calling on the government for help is natural. The people always do and get so little in the way of empty promises made by the government.<sup>132</sup> As the case study report states, “state authorities come and make false promises.”<sup>133</sup> Some with the capacity to afford rent, relocate to other communities. Still, some wait indefinitely for the government. Few expect support from better financially placed neighbours whereas foreigners from Ghana often choose the option of returning to their native countries. Many struggle still, with no visible reliable alternative because of poverty.

#### *Recommendations*

1. There is need for sensitization of stakeholders on climate change effects.
2. Leverage community-based approaches to address tensions and conflicts related to the degradation and restoration of the environment.
3. Improve the productivity of fisheries.
4. Create alternative livelihood opportunities.
5. Deliver basic social services such as water, sanitation and hygiene to victims of climate change.

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131 Konko, Y., Bagaram, B., Julien, F., Akpamou, K.G. & Kokou, K. (2018). Multitemporal analysis of coastal erosion based on multisource satellite images in the south of the mono transboundary biosphere reserve in Togo (West Africa). *Open Access Library Journal*, 5, e4526. <https://doi.org/10.4236/oalib.1104526>

132 FGD Togo

133 Togo case study report, 2020

### 3.7 Senegal

Located on the western edge of the African continent between 12.20° and 16.40° north latitude and 11.20° and 17.30° west longitude, Senegal covers an area of 196 722 km<sup>2</sup>. It is bounded to the north by Mauritania, to the east by Mali, to the south by Guinea Conakry and Guinea Bissau, and to the west by the Atlantic Ocean.<sup>134</sup> This geographical position gives Senegal a 700 km coastal and maritime zone from Saint-Louis (north) to Ziguinchor (south). It is characterized by a diverse range of ecosystems and resources, including mangroves, lagoons, marsh estuaries and sand beaches.

The study was undertaken in the coastal communities of Kayar and Niodior. Situated at 14° 55' north and 17° 07' west latitude, Kayar is a small town on the coast of the Atlantic Ocean. It is 60 km from Dakar, Senegal's capital city. Administratively, Kayar is part of the Thiès region and belongs to the Bourronde de Pout.

Figure 24: Map of Senegal showing the coastal and neighbouring countries



Source: <https://www.un.int/senegal/senegal/country-facts>

Kayar is an old fishing community that ranks third in terms of fish harvest in Senegal, according to the 2020 State of the Environment. The city attracts thousands of people each year for its flourishing fisheries. Thousands of organisations do fishing using traditional and modern practices or methods. However, for several years now, the fishing sector, the engine of the local economy, has been facing difficulties linked to the scarcity of fish.

134 [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Environmental-and-Social-Assessments/Senegal-PROMOVILLE\\_-12\\_2016.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Environmental-and-Social-Assessments/Senegal-PROMOVILLE_-12_2016.pdf)

This situation is aggravated by the arrival of fishermen from other localities in Senegal, including the Gouat-Ndariens de Saint-Louis, sometimes leading to conflicts arising from fishing practices. Future oil development in the region worries fishing communities in particular because of the potential implications for fisheries resources.

On the other hand, the village of Niodior where the study was also carried out, is part of the Saloum Delta Islands, located in the Fatick area of the country. Niodior is situated within the municipality of Dionewar. Fisheries is the principal economic activity of this community.

### *Climate Change*

These coastal zones are rich in biodiversity and central to Senegal's economy. However, they are vulnerable to impacts of climate change. Coastal erosion, changing temperatures and precipitation, rising sea levels, frequent extreme weather events and scarcity of fisheries resources are the main threats to the Senegalese coast. Other environmental problems include disposal of industrial and household waste in the sea and on the coast, and poor fishing systems of some people, encouraging risks of insecurity and conflict. The recent discovery of oil in the deep offshore Sangomar block, and a natural gas reserve in the deep offshore Kayar and Saint-Louis, risk accentuating the scarcity of fishery resources when the situation is already tense.

The Saloum Delta is vulnerable to global warming issues.<sup>135</sup> The coastline of the Saloum Delta will be more exposed to the risks of extreme climatic events, acceleration of sea-level rise, erosion, destruction of infrastructure, socio-economic and human settlements losses. Calculations of the coastal vulnerability index show the area will be very vulnerable, particularly for the part located between Ngalou Sessene and the south of Niodior, which happen to be inhabited places. Studies carried out by Sadio, Seck, Noblet and Camara<sup>136</sup> show that the mean rate of erosion in this part of the coast will be 8.65 m/year by 2050. These consequences of climate change could lead to social tensions in the affected communities. Once again, the future exploitation of oil discovered off Sangomar could disrupt the production methods of communities largely dependent on the maritime economy.

The various discussions with fishing communities show that local stakeholders are well aware of the reality of global warming. Expressions or viewpoints vary from person to person.

In Kayar, some consider climate change to be air pollution and a factor in weather variations. Others explain climate change as the problem of species being scarce at sea level. Climate change has caused seasonal changes leading to temperature disturbance at sea level. Some species breed during the winter, and climate change has disrupted seasons favouring species migration.

Participants demonstrated understanding of climate change from using their experience. It was described through their experience with rising temperatures, the advancing of the sea, the irregularity and decrease of precipitation, the decrease of trees (deforestation) and the scarcity of fish. However, regarding the causes of global warming, while participants mostly indicated human activities, some were rather superstitious, arguing that this is an act of God.

### *Social, Economic and Environmental Effects*

Sea-level rise is the most widely known climate change problem, especially in the Kayar region. The advancing of the sea causes water overflows, bringing with it, material and spatial resources. According to a report "the advance of the sea is the first sign of climate change in Kayar. When we were children, we walked almost 1 km between where the canoes were parked and the sea. But today as you see the distance is not more than 100 metres."<sup>137</sup>

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135 M. Sadio, A. Seck, M. Noblet, and I. Camara(2019). Evaluation de la vulnérabilité du secteur de la zone côtière à la variabilité et aux changements climatiques dans la région de Fatick. Report produced under the project Projet d'Appui Scientifique aux processus de Plans Nationaux d'Adaptation dans les pays francophones les moins avancés d'Afrique subsaharienne, Climate Analytics GmbH, Berlin.

136 Ibid

137 Centre de suivi Ecologique (2020). Rapport sur l'état de l'Environnement au Sénégal.

**Figure 25: Interview session with study participant in Kayar, Senegal**



Source: Research team

Climate change is impacting the migration of fish species, leading fishermen to move to areas where species are more prevalent.<sup>138</sup> As one participant said, “here at Kayar, the drivers of climate change is the scarcity of fish species. In 2009, when I was the head of the fishing dock, I buried more than 55 tons of fish because the sea was very fruitful...Today it’s impossible to relive this in Kayar because of climate change.” Participants said weather conditions are contributing to diseases among children. Participants said mangroves in Niiodior, which they understand from local knowledge, are important as nature-based fish producers. In recent years, however, much of the coastal area has been lost to the sea.

As for the shortage of fish in the Saloum Delta Islands, a young fisherman said:

*In the past, few people fished. As a result of reduced precipitation, some people who were farmers turned to fishing. Consequently, there is an increase in the number of fishers, whereas there is a shortage of fish. Population growth in the village also puts pressure on fisheries resources. Heads of families face additional problems when it comes to feeding their families. To cope, the fishing actors are forced to use smaller sized nets that capture fish quickly but unsustainably.<sup>139</sup>*

The fisherman sees climate change as the divine will of God. Salinization of agricultural land and the abandonment of agriculture by a good number of the households were highlighted by participants. The flooding of a village mosque located a few metres from the pier and the use of fertilizer for the improvement of agricultural land, which a participant said is impoverishment of land, also feature as part of the effects of climate change in Niiodior. The issue of bird loss and the reduction of maize crops has emerged strongly in relation to the effects of climate change.

138 <https://nca2018.globalchange.gov/chapter/8/>

139 Interview in Niiodior

The effect of climate change has to do with people's well-being. Many have moved away from fishing to other activities like trade due to the decline in fishing species. So, income levels have come down. Given the significance of the fisheries sector in terms of per capita income and reliance of many people on the sector for survival, the effects of climate change in this regard have broader implications for local and subnational economy of Senegal. According to one participant: "I was a fishmonger, and I made a good living from this activity." But currently I went back to the potato farming because the sea does no longer gives us sufficient resources."<sup>140</sup>

The effects are also seen in other economic activities such as trading, transportation, and catering that depend on fisheries. The interdependence between fishing and other activities is well noted. In the words of a participant: "in Kayar, shopkeepers, drivers and cart drivers depend on fishing because it is the fishermen who use these services. If the sea is not productive at times, the consequences are felt in other activities because they depend on fishing activity."<sup>141</sup>

Climate change also has political effects. Nowadays, the advancement of the sea causes the destruction of houses and workplaces causing the displacement of populations in search of new habitats. Faced with this situation, state authorities face new challenges. As another participant argued,

*The authorities often come to see the state of the areas affected by the coastal erosion. There is the example of the ice factory you see here, the sea took over the factory and the authorities often come to visit but until now there is no follow up. There are also many houses and gas stations that were also taken by the sea.*<sup>142</sup>

The environmental effects of climate change include disturbance of ecosystems services and agricultural activities. Unconventional long periods of dry season, perceived by participants to be a result of climate change, affects seasonal planting and harvesting of agricultural products. In the Saloum Delta, farmlands have been abandoned due to colonization. As the sea continues to encroach on land, taking it over, and reducing space for cultivation of crops and habitation, one thing is sure, the risk of insecurity and conflict also multiply. Community peoples' sense of insecurity due to this situation creates other social problems.<sup>143</sup>

#### *Insecurity and climate-related conflicts*

Sea encroachment in Kayar, for example, is a cause of insecurity. The strong connection with insecurity is based on the vulnerability of the local population. The risk of homelessness, food insecurity and environmental degradation results from the condition of powerlessness. Once affected by erosion, families or individuals would seek new lands. And it does not come easy.

Conflict is common between Kayarian fishermen and those from other communities. The bone of contention is the use of unacceptable fishing techniques that end up hurting the environment and causing the death of fish. The threat it poses to the survival of community people are partly why indigenous fishers<sup>144</sup> oppose destructive fishing methods. This suggests a form of conflict similar to the struggle for scarcity of species at specific areas in the sea. In any area of the sea where fishers perceive a concentration of fish over a space of time, they will each, struggle to be in that space. This alone means a form of struggle with existential and potential conflict. As one participant remarked, "you see 15 canoes sharing a space where only 3 canoes were supposed to be. They jostle to be the first served, which sometimes leads to very violent conflicts in the sea."

Participants reported that climate-related conflicts are less virulent in Niidior. But there is pressure on limited available fisheries resources.

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140 Interview in Kayar

141 Interview in Kayar

142 Interview in Kayar

143 A. Baillat, and L. Maertens (2017). Changement climatique et conflits: attention aux raccourcis simple, Reporterre le quotidien de l'écologie.

144 Interview in Niidior

Meanwhile, analysis shows a high number of fishermen looking for limited resources. They now fish night and day. Some even use so-called “sleeping” nets which sometimes triggers bitter conflicts.<sup>145</sup>

Concerning the future of oil exploration off Sangomar, the coastal communities are divided concerning the potential negative effects on the environment as well as on the fishing sector.

### *Recommendations*

In summary, although there is no direct link between climate change and conflict, tensions exist over issues that have clear and indirect results. Participants are aware of the reality of climate change. In their view, monitoring the sea has become crucial to reduce the risk of tension and conflict. Effective strategies to protect and restore agriculture are urgently required. The participants believe the communities have enormous tourism potential that needs to be developed for the purpose of overall development of Senegal.

### *Implications of Findings for Project Team*

The reality of climate change, its impact on socio-economic life of people, security, and conflict in coastal communities, require framing of interventions with conflict-sensitive climate change adaptation principles as key elements. Below are some of recommendations for the project team:

- Use cross-cutting instruments in response to the coping needs of coastal communities based on issues that commonly characterize them such as the social, economic and environmental conditions that make them vulnerable to insecurity and conflict.
- Adapt and promote European Union policy framework such as the Integrated Coastal Zone Management (ICZM)<sup>146</sup> and Maritime Spatial Planning within the limit of unique and nuanced social, economic and environmental settings in West Africa.<sup>147</sup>
- Support local agriculture and fishing with training, modern farming tools, and micro-credits to tackle the threat of food insecurity arising from disruptions in seasonal circles of farming and fishing across communities.
- Establish effective, efficient, and functional early warning systems to monitor the risk of climate-induced insecurity and conflict in the communities, and to support communities and state authorities.
- Support regular scientific and social research on climate change and conflict in West Africa, as well as advocacy around the uptake of findings by wider civil society and climate policy community at the local, national, and multilateral fronts.
- Strengthen community resilience to climate change by supporting poverty reduction projects such as skills development and smart agriculture to deal with the problem of hunger, unemployment, crime, and general human insecurity issues.
- Promote climate education with useful context-specific adaptation and mitigation strategies as key elements.

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145 Conseil local de pêche artisanale de Niodior, 2018. Convention locale pour une gestion durable des ressources halieutique.

146 European Commission: [https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index\\_en.htm](https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm)

147 The aim of MSP is protection of the West African marine environment. On the other hand, the ICZM is an integrative, interactive, inclusive, sustainable and holistic approach to addressing complex environmental problems in coastal areas. The concept is traced to the 1992 Earth Summit in Rio de Janeiro and presented in Agenda 21. [http://www.coastalwiki.org/wiki/Integrated\\_Coastal\\_Zone\\_Management\\_\(ICZM\)](http://www.coastalwiki.org/wiki/Integrated_Coastal_Zone_Management_(ICZM))

- Decolonize climate change solutions by promoting and utilising local knowledge and de-emphasizing capitalist or market solutions.
- Promote projects and ideas for legitimate income and livelihoods diversification, especially through renewable energy solutions.
- Project implementation should be guided by conflict-sensitive and “Do No Harm” principles.
- Develop tools for intervention in agriculture and food insecurity, disaster risk management, energy, health and water, according to the Global Framework for Climate Service (GFCS).<sup>148</sup>

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148 This is a framework intended to encourage climate-science-driven decision-making in terms of adaptation to reduce the impact of climate change on the human condition, especially in the developing world.

## 4.0 Conclusion

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The study found out that climate change, measured as changes in weather patterns and manifested in temperature increases (hot weather), sea-level rise, sea encroachment on land, coastal erosion, floods, and thunderstorms are drivers of various forms of insecurity and conflict that are mainly domestic and communal in nature. Vast qualitative data on these issues obtained from an initial desk review, focus group discussions, interviews and observations, including photo messages, enabled the conclusion that climate change has a relationship with insecurity and conflict in coastal communities of Nigeria's Niger Delta. This relationship is, however, indirect and happens mainly in local peoples' decisions about adapting their livelihoods to the impact of climate change. In addition, there are grievances rooted in the perception of the negative impact of corporate oil and gas activities, and failure of the industry to provide economic opportunities for locals. The experience of violent conflict between communities on the one hand and oil corporations and the government on the other with militants from across the coastal communities of the Niger Delta as key actors, gave a background to youth easily shifting to illegal oil refining as coping strategies. Worse, is the uneasy feeling that some of the major oil companies are now selling off their onshore oil facilities and replacing them with investments on the high seas without any hope they would clean up the environment they have polluted for years.

### *Local Knowledge of Climate Change*

The perception of climate change matters in assessing its social, economic and environmental effects. Participants demonstrated local knowledge of it and identified the indicators in their environment. This is based on the people's historical awareness of the changes taking place in their environment. As one participant put it in the case of Bayelsa State, "Climate change as the name implies is the change of weather patterns from the normal way, we used to experience it. Nowadays, there is little distinction between the wet and dry seasons. There is a change in the climate. That is what I understand by climate change."<sup>149</sup> The people's ideas about the changes relate directly to whether natural recourses such as rivers, sea, ocean, soil, forest, and the weather are continuing to support legitimate social, economic and cultural activities. In other words, their understanding of climate change is rooted in their individual, collective and historical experience with productive activities such as fishing and farming. The key element of all this is the perception that climatic conditions are constraining local productivity and are the consequences of oil industry activities.

The fact that it is no longer possible for fishers and farmers to fully predict weather conditions means they would have limited chances of making the right decisions about when to start investing time and energy in a supposed fishing or farming season. Despite language barrier, responses pointed generally to existing practical local knowledge of a changing climate often assumed to be lacking among illiterate local populations.

The locals worry about the disappearance of land, loss of plants, fish and animal species, river and sea encroachment on land, loss of mangroves, invasion of nypa palm, ferocious storms, hot weather, and other changes taking place in the communities from the perspective of local knowledge of the environment. As Elder Gogo Abietegha Brown puts it for the case of Bonny, Rivers State, "no fish is close-by. Where we go to get fish is far...these things didn't happen before, fishermen are angry...erosion has taken more than forty houses."<sup>150</sup> Participants from Bonny and Kono Rivers State-linked hardship and poverty to climate change. They associated the hardship and oil pollution with the scarcity of fish in their river.

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149 Interview with Chief Ereku, Secretary Buama Council of Chiefs, Public Relations Officer, Akassa Clan Council of Chiefs, Bayelsa State, 24 April 2022.

150 Interview, Bonny, Rivers State, 25 April 2022



The ebbing of the Finima Nature Park and the insistence on conservation by locals is indicative of local knowledge of the environment. Much more is the knowledge of nature-based adaptation, such as the choices about what to do in an atmosphere of unpredictable seasons such as harmattan. The elements of local knowledge of climate change include the acknowledgement by participants that they have experienced changes in weather conditions in their communities over the years. In addition, they acknowledged that these changes in weather conditions have led to changes in their way of life, traditions, and culture. In Akwa Ibom State, participants used words such as 'excess rainfall', 'flooding', 'no harmattan', 'poor crop yield', 'weather changes', 'heat', 'dryness' and 'sea-level rise' to describe their experiences and what they know about climate change either in English or in the local language. In the same vein, those in Bonny, Rivers State, generally showed their knowledge of climate change including the importance they attach to the ocean breeze. They described the value of "ocean breeze" to fisherfolks who must use it to read the best time to go out for fishing. As one of them put it, "the change in harmattan season is affecting us, especially fishing in the sense that we the fishers, like the sea breeze because it brings fish."<sup>151</sup> Ocean breeze is used by locals to refer to the spell of hot weather and felt from the sea during seasons such as harmattan. Fisherfolks see the sea breeze during harmattan seasons as rewarding for fishing and disempowering when the season fails to show up at the right time or becomes unpredictable.

In Bayelsa State, community people's knowledge of climate change is closely tied to changes in the sequence of the seasons such as the rainy season and the harmattan. As one participant puts it,

*As a layman, I understand climate change as a change in weather conditions. Like when we were somehow younger, when it was time for rain, it would fall. But these days the rain will fall as we know it when it is time for the rainy season and when it starts falling, it goes on throughout maybe the whole year.<sup>152</sup>*

The salinity of the water is of growing concern in the Akassa Brass region of Bayelsa. Local knowledge suggests that this is a serious concern for the availability of certain fish species. When it comes to productivity, climate change was stressed as a constraint on fishing and agriculture. Mr. Williams, the secretary of the Community Development Community, Akassa, stated:

*...climate change has affected us greatly. Now as you can see me returning from the rivers, previously if I go like this and come back, I see a lot of fish. But now, because of climate change we cannot even kill fish. Just a little I have now, five pieces of fish I caught after spending the night, because of climate change... that's one. Secondly, climate change has affected us so greatly. Now our crops are not even growing as you can see. You see this plantain I planted some years ago, has not borne fruit. Every mango as you see in my compound, everything is affected, may be because of oil spillage, gas flaring, so climate change is affecting us well. Even you can see the landmark washing away because of climate change.<sup>153</sup>*

The understanding of climate change in terms of impact on local economic activities and the result of human industrial activities were demonstrated by the participants. As the director of Fisheries in the Bayelsa State Ministry of Agriculture, Igbata Aboma, noted, "my little understanding of climate change is a change in the environment that affects the organism and the livelihood of persons in such environment,"<sup>154</sup> He linked their experience with the activities of oil companies. Illegal oil

151 Mfoniso Antia. 2022. Akwa Ibom State case study: climate change, insecurity, and conflict in the Niger Delta, preliminary report from the field presented at Sense-Making meeting at De Palm, Port Harcourt on 5 May

152 Jim-Dorgu, G. and Omas, K. .2022. Bayelsa State case study: climate change, insecurity, and conflict in the Niger Delta, preliminary report from the field presented at the Sense-Making meeting at De Palm, Port Harcourt on 5 May

153 Ibid.

154 Ibid.

refining is condemnable but many have the view that both the oil companies and illegal oil refiners are culpable in the changing climate through pollution.

Despite language wall issues, participants from Cross River State demonstrated evidence of local knowledge about climate change. Like the rest of the Niger Delta, their knowledge of climate change is based on their involvement in the routine struggles for survival through fishing and agriculture. The state is a prime destination for the United Nation's climate change mitigation scheme- Reducing Emissions from Deforestation and Forest Degradation. In addition, they have a long-time practice of modest documentation of the changes in their environment. Therefore, it was very easy for them to draw a fine connection between the depletion of mangrove trees and a decline in fisheries. This is based on local knowledge of the role of mangroves in the availability of fish in the aquatic environment.

### ***Insecurity and Conflict***

The struggle for limited resources is at the core of every notion of insecurity and conflict in the Niger Delta. Participants used phrases such as "no peace", "theft", "piracy" and "boat engine theft" to describe their experience of insecurity and conflict in their communities. They constantly live in fear of not knowing which land or house would be next to be swallowed by the sea or destroyed by heavy storms. A significant concern lies in the growing activities of cult groups and rival violent confrontations. The relationship between climate change, insecurity and conflict are not direct. The variables are indirectly related to the social and economic conditions of the impacts of climate change.

Fear is considered a major problem of insecurity and criminal conflict. Participants framed this connection by explaining the context for growing youth involvement in cultism as a form of power for seeking benefits and influence in the overall struggle for scarce resources. In the same vein, rising cases of piracy and armed robbery across the study locations which participants argued were not common in the distant past have become sources of fear in the community. The resort to crime such as the emerging armed commercial periwinkle picking in the Nembe area of Bayelsa by young people is particularly instructive. The Nembe community forbids the selling of periwinkles as a matter of tradition. But people from other communities are now involved in commercially gathering of this resource in that community. The move to sell it in places outside of Nembe now comes with fierce resistance from the Nembe community who insist that their tradition be respected. They insist that it is culturally prohibited to harvest periwinkles for sale. The perpetrators now arm themselves with weapons to defend themselves against the resistance of young people in Nembe.

Dislocation of the local peasant economy by sea-level rise, flooding, sea encroachment on land, frequent storms and unpredictable rainfall have created fear of the unknown for many whose entire means of support are the resources found in the sea, forest, land and creeks. Insecurity is seen primarily as a condition of fear.

Participants identified climate-related insecurity and conflict in coastal communities based on the impacts of individual and community-based adaptation actions. Adapting livelihoods to climate change creates insecure conditions that spark conflict. The fact that issues such as sea-level rise and encroachment on land do not directly cause physical destructive conflicts means that the relation between the variables is indirect. Instead, adaptation to climate change creates the conditions for constructive and destructive conflict. Constructive conflict leads to better relations between parties who have chosen peaceful approaches to resolve issues. They include disagreements and tensions peacefully resolved before escalation as seen in some parts of the Niger Delta where those who, for example, lose their land to sea encroachment are compensated by community or family with the allocation of available portion of land in-land to build a house or farm. On the other hand, destructive conflicts are those that parties allowed to escalate to the level of violence as seen in the case of criminal conflicts and armed contentious relationships among fishing communities. Cult groups who fight or attack each other with dangerous weapons like rifles and knives are common in the area. The proliferation of these groups in the region is, however, traced to the violent campaign by militants, in the 1990s, against the lack of development and pollution of the environment by international oil companies in the region.

Forms of insecurity such as fear and lack of physical, economic, social and environmental sense of safety resulting from a decline in food availability and affordability, and armed criminal violence are not direct offshoots of climate change. Instead, they are the result of the conditions created that have

far-reaching impact on society and how productive activities are organised. Conflict is primarily indirect in that it is insecurity in its various forms, including food and human security, that triggers latent and overt conflict. The indirect nature of these conflicts happens in families and communities through adaptation strategies taken by the people. Adapting local economic activities to climate change comes with insecurity and conflict whose elements include embedded social tensions in the struggle for scarce resources among locals which occurs at the level of family and community. There are also conflicts among fishermen in different contiguous communities.

Participants defined insecurity as injustice, violence, and the vulnerability of people to the socioeconomic and environmental consequences of climate change. In the words of one participant, "Insecurity is when there is no peace. It is a situation where someone is not having peace of mind. If an environment is threatened, there is insecurity."<sup>155</sup> Uncertainty is an aspect of the elements of insecurity in the Niger Delta when issues of the unpredictability of weather conditions are considered by fisherfolks and farmers who depend on their knowledge of the weather for the forecast of when it is best to set out to the sea and when it is best to clear the land for farming.

Construed as an inevitable element of every society, climate-related conflict across the locations of the study then refers to disagreements between and among people in communities over resources. One farmer referred to it as:

*disagreement or dispute among people, communities, towns, villages, societies and even countries. Conflict arises from interests over resources and means of production like land, water, fishing and farming grounds. Even politics could be a contributory factor. It can arise in families. It embodies disagreements, disputes and cold or silent wars.*<sup>156</sup>

In this context, climate-related conflicts are widespread in the Niger Delta. For example, there was a story of a fisherman in Buama, Akassa who left his community to fish in another community with a prohibited practice. He continued fishing even after receiving orders to cease using the method. The people of the community finally forcibly detained him and flogged him before the community people. This almost caused an intercommunal dispute between his community and Buama.<sup>157</sup>

#### 4.1 Recommendations

- Address climate-related issues by paying special attention to the dynamics and nuances of issues identified through regular analysis.
- Strengthen early warning systems and responses with analytical results.
- Carry out climate change education in some of the communities in the Niger Delta where climate change is perceived as an act of God in which humans have very little to do as mitigation. For example, extreme heat and rainfall, sea-level rise, storms and floods are perceived by some as problems only God can resolve. While mitigation and adaptation are generally costly to undertake, people need to fully understand that we all have a role to play in reducing the effects of climate change through appropriate responses. State and local governments should provide drainage channels to take water away from flood prone areas.
- Communities should set up conflict management systems to address climate-induced issues arising from the struggle for natural resources and the search for alternative sources of livelihood.

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155 Ebiegberi Raynus, interview in Akassa, .....

156 Nyorn, famer, interview, Akassa, .....

157 Interview with Secretary, CDC, Akassa.

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