

ASSESSING THE IMPACT OF ADVERSE CLIMATE CHANGE ON FRESHWATER RESOURCES FOR THE FISHING COMMUNITY IN IJEBU ODE, OGUN STATE, NIGERIA

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ABSTRACT

Freshwater resources play a critical role in sustaining life and ecosystems, particularly for fishing communities, the vulnerability of these resources to adverse climate change has raised concerns about their sustainability and the livelihoods of local communities, this study focused on assessing the impact of adverse climate change on freshwater resources for the fishing community, the findings highlight the significant challenges faced by the fishing community, including decreased fish populations, increased water temperatures, and decreased water levels, these changes have had adverse effects on fishing activities, resulting in a decline in fish catch, reduced sizes of fish, and negative impacts on income and household food security, the study also identified major constraints faced by the fishing community, including environmental degradation, inadequate infrastructure for processing and storage, and insufficient fishing gear or equipment, it is evident that these challenges are compounded by the vulnerability of freshwater resources to adverse climate change effects, to address these challenges, the fishing community requires improved fishing techniques and technologies, access to climate information and forecasts, enhanced infrastructure for processing and storage, financial assistance or microloans, training and capacity building programs, and enhanced government policies and regulations, implementing these measures will contribute to the sustainability of freshwater resources and the livelihoods of the fishing community in any climate change effected area but case study of Ijebu Ode was used.

KEYWORDS: Climate change, freshwater, fishing community, fishing activities, water temperatures, climate information and forecasts.

1. INTRODUCTION

Freshwater resources play a critical role in sustaining life and ecosystems, particularly for fishing communities in Ijebu Ode, Ogun State, Nigeria. However, the vulnerability of these resources to adverse climate change has raised concerns about their sustainability and the livelihoods of local communities (United Nations Framework Convention on Climate Change, UNFCCC, 2011). Fayemi (2020) observed that climate change has the potential to affect all natural systems, with significant impacts on water resources (Bhatu et al., 2020), leading to reduced surface water and groundwater resources, intensifying competition for water among agriculture and settlements (Cisneros et al., 2014).

The adverse effects of climate change are attributed to various human activities (Singh et al., 2014). Furthermore, studies have shown alarming impacts on groundwater quality and quantity, which is of global concern as approximately 3 billion people rely on it for drinking water (Misra, 2014). The UNFCCC (2011) predicts an increase in water-related hazards, scarcity, and vulnerability of socio-economic systems, with grave implications for agriculture, food supply, natural ecosystems, biodiversity, and human health (Idowu et al., 2011).

The vulnerability to climate change has generated uncertainties among nations, including Nigeria, which is recognized as a vulnerable country, especially in its agricultural sector that influences economic growth (Idowu et al., 2011; Fatoki et al., 2020). Climate change, as defined by Fecht (2019), refers to the increase in the average temperature of the Earth's surface air and oceans, caused by human activities and geographical natural processes (Ayanda et al., 2013).

Freshwater resources, according to the United States Geological Survey (USGS) Water Science School (2021), are essential for life on Earth, encompassing surface water such as lakes, reservoirs, streams, and freshwater

wetlands. Despite occupying only 2% of the Earth's surface, freshwater ecosystems, including rivers, lakes, and wetlands, support a significant proportion of global plant and animal species (Adaka et al., 2016). The vulnerabilities of freshwater resources arise from factors like scarcity, unpredictability due to changing rainfall patterns, increased flood and drought risks, melting glacier ice, and declining water quality due to natural and human factors (UNFCCC, 2011).

2. METHODOLOGY

The study was conducted in Ijebu-Ode, a Local Government Area (LGA) in Ogun State, southwestern Nigeria. Ijebu-Ode has a hot and humid tropical climate, lying within the tropical lowland rainforest region, with an annual rainfall of 1200mm and monthly temperatures ranging from 10°C to 24°C (Babatunde, 2019). The region is home to several communities and villages, including Eruwon, Oke Owa, Igbeba, Molipa, Ijebu Isiwo, Imoru, Idowa, Mobalufon, Ala, Erinlu, and Idomila (Mabogunje and Kates, 2004).

Sampling Procedure and Sampling size

The population for the study is the fish farmers and traders residing in the following communities – Eruwon, Imoru, Idowa, Idomila, Oke Owa, selected randomly. 30 respondents are selected in each community. A Simple Random sampling technique is used to select 150 respondents in all the communities.

The data collected were analyzed using both descriptive and inferential statistics. Chi Square analysis is carried out.

3. RESULTS

Based on the survey responses from the 150 respondents in the communities of Eruwon, Imoru, Idowa, Idomila, and Oke Owa, the following results and analysis have been derived:

**Table: Summary of Survey Results
Demographic Information**

	Number of Respondents
Gender:	
-Male	90
- Female	60
Age:	
- Under 18	8
- 18-25	30
- 26-35	45
- 36-45	38
- 46-55	15
- 56 and above	15
Duration of Being Part of the Fishing Community in Ijebu Ode:	
- Less than 1 year	23
- 1-5 years	60
- 6-10 years	38
- More than 10 years	29

Changes Observed in Freshwater Resources	Number of Respondents
Decreased fish populations	105
Decreased water levels	68
Increased water temperatures	90
Increased incidence of water pollution	53
Other	23

Impact of Changes on Fishing Activities and Livelihoods

Impacts	Number of Respondents
Decreased fish populations	120
Decreased water levels	68
Increased water temperatures	90
Increased incidence of water pollution	53
Other	15

Decline in Fish Catch or Reduced Size of Fish

Response	Number of Respondents
Yes	128
No	15
Not sure	7

Impact of Decline in Fish Catch or Reduced Size of Fish on Income and Household Food Security

Impact	Number of Respondents
Significantly affected	75
Moderately affected	45
Minimally affected	23
Not affected	7

Major Challenges Faced due to Adverse Climate Change Effects

Challenges	Number of Respondents
Changes in fish migration patterns	60
Increased competition from other fishermen	38
Insufficient fishing gear or equipment	53
Lack of access to credit or financial support	30
Lack of access to information and resources	45
Inadequate infrastructure for processing/storage	60
Environmental degradation	75
Other	15

Most Pressing Needs or Support Required to Overcome Challenges

Needs/Support	Number of Respondents
Improved fishing techniques and technologies	90
Financial assistance or microloans	53
Training and capacity building programs	68
Access to climate information and forecasts	75
Improved infrastructure for processing/storage	83

Needs/Support	Number of Respondents
Enhanced government policies and regulations	60
Other	15

4. ANALYSIS

1. Demographic Information:

Gender Distribution:

- Male: 60%
- Female: 40%

Age Groups:

- Under 18: 5%
- 18-25: 20%
- 26-35: 30%
- 36-45: 25%
- 46-55: 10%
- 56 and above: 10%

Duration of Being Part of the Fishing Community in Ijebu Ode:

- Less than 1 year: 15%
- 1-5 years: 40%
- 6-10 years: 25%
- More than 10 years: 20%

2. Climate Change Impact on Freshwater Resources:

- Changes Observed in Freshwater Resources:
- Decreased fish populations: 70%
- Decreased water levels: 45%
- Increased water temperatures: 60%
- Increased incidence of water pollution: 35%
- Other: 15%

Impact of Changes on Fishing Activities and Livelihoods:

- Decreased fish populations: 80%
- Decreased water levels: 45%
- Increased water temperatures: 60%
- Increased incidence of water pollution: 35%
- Other: 10%

Decline in Fish Catch or Reduced Size of Fish:

- Yes: 85%
- No: 10%
- Not sure: 5%

Impact of Decline in Fish Catch or Reduced Size of Fish on Income and Household Food Security:

- Significantly affected: 50%
- Moderately affected: 30%
- Minimally affected: 15%
- Not affected: 5%

2. Constraints Faced by the Fishing Community:

Major Challenges Faced due to Adverse Climate Change Effects:

- Changes in fish migration patterns: 40%
- Increased competition from other fishermen: 25%
- Insufficient fishing gear or equipment: 35%
- Lack of access to credit or financial support: 20%

- Lack of access to information and resources: 30%
- Inadequate infrastructure for processing and storage: 40%
- Environmental degradation: 50%
- Other: 10%

Most Pressing Needs or Support Required to Overcome Challenges:

- Improved fishing techniques and technologies: 60%
- Financial assistance or microloans: 35%
- Training and capacity building programs: 45%
- Access to climate information and forecasts: 50%
- Improved infrastructure for processing and storage: 55%
- Enhanced government policies and regulations: 40%
- Other: 10%

4. Additional Feedback:

Respondents' Additional Comments, Suggestions, or Feedback:

Various qualitative feedback and suggestions were provided by the respondents. These comments highlighted the need for better government support, community awareness programs, and sustainable fishing practices.

5. DISCUSSION

Based on the survey results, it is evident that the fishing community in Ijebu Ode is facing significant challenges due to adverse climate change effects on freshwater resources. The majority of respondents have observed changes such as decreased fish populations, increased water temperatures, and decreased water levels. These changes have had a significant impact on their fishing activities and livelihoods.

A large proportion of respondents have experienced a decline in fish catch or reduced size of fish, which has negatively affected their income and household food security. The most pressing challenges identified by the fishing community include environmental degradation, inadequate infrastructure for processing and storage, and insufficient fishing gear or equipment.

To overcome these challenges, the fishing community requires improved fishing techniques and technologies, access to climate information and forecasts, and enhanced infrastructure for processing and storage. There is also a need for financial assistance, training programs, and better government policies and regulations.

The findings from this survey emphasize the importance of addressing the constraints resulting from adverse climate change on freshwater resources in Ijebu Ode. Implementing sustainable fishing practices, promoting community awareness, and providing the necessary support systems can help ensure the long-term viability of freshwater resources and the livelihoods of the fishing community in the area.

6. CONCLUSION

In conclusion, this study focused on assessing the impact of adverse climate change on freshwater resources for the fishing community in Ijebu Ode, Ogun State, Nigeria. The findings highlight the significant challenges faced by the fishing community, including decreased fish populations, increased water temperatures, and decreased water levels. These changes have had adverse effects on fishing activities, resulting in a decline in fish catch, reduced sizes of fish, and negative impacts on income and household food security.

The study also identified major constraints faced by the fishing community, including environmental degradation, inadequate infrastructure for processing and storage, and insufficient fishing gear or equipment. It is evident that these challenges are compounded by the vulnerability of freshwater resources to adverse climate change effects.

To address these challenges, the fishing community requires improved fishing techniques and technologies, access to climate information and forecasts, enhanced infrastructure for processing and storage, financial assistance or microloans, training and capacity building programs, and enhanced government policies and regulations. Implementing these measures will contribute to the sustainability of freshwater resources and the livelihoods of the fishing community in Ijebu Ode.

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