



EFFECT OF CLIMATE CHANGE AND COPING STRATEGIES ON SOCIO-ECONOMIC STATUS OF FISHERFOLKS IN ILAJE-ESE ODO LOCAL GOVERNMENT AREAS OF ONDO STATE, NIGERIA

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ABSTRACT

This study discusses the climate changes, the disasters associated with these changes such as floods at Ilaje/ Ese-Odo Local Government areas of Ondo State, Nigeria which is a riverine area, their negative impact on fish production, livelihoods, food security and the condition of the vulnerable groups in the area. The study goes on to discuss the coping strategies embarked upon by the fisher folks to adapt with these changes and the challenges faced in implementing these coping strategies. Five fishing communities were used for this study, twenty respondents from each community making a total of one hundred respondents in all. The respondents are mostly youths in their productive age (60%). Most of them had no formal education (35%). Majority of them are married indicating that they are permanent settlers in the area and they also have large household size which translates to large dependants and responsibilities to take care of. Income from off-fishing activities is less than income from fishing activities which makes them to live below poverty level. Lack of adequate capital was observed as the main problem. From the study, adequate finance in terms of loan with relax conditions will go a long way in assisting them in their off-fishing activities thereby improving their living standard.

KEYWORDS: Climate change, Coping strategies, Fisher-folks

INTRODUCTION

Water resources are sources of water that are useful or potentially useful to humans. Uses of water include agricultural, industrial, household, recreational and environmental activities. Virtually all of these human uses require fresh water. 97% of water on the Earth is salt water, and only 3% as fresh water of which slightly over two thirds is frozen in glaciers and polar ice caps. (Chen et al 2006) The remaining unfrozen freshwater is mainly found as groundwater, with only a small fraction present above ground or in the air. (Allen et al 2002)

Fresh water is a renewable resource, yet the world's supply of clean, fresh water is steadily decreasing. Water demand already exceeds supply in many parts of the world and as the world population continues to rise, so too does the water demand. Awareness of the global importance of preserving water for ecosystem services has only recently emerged as, during the 20th century, more than half the world's wetlands have been lost along with their valuable environmental services. Biodiversity rich freshwater ecosystems are currently declining faster than marine or land ecosystems. (Giannini et al 2002) The framework for allocating water resources to water users (where such a framework exists) is known as water rights.

WHAT IS CLIMATE CHANGE?

Scientists around the world now agree that the climatic changes occurring internationally are the result of human activity. Climate change could have significant impacts on water resources around the world because of the close connections between the climate and hydrological cycle (Dai 2006b). Rising temperatures will increase evaporation and lead to increases in precipitation,

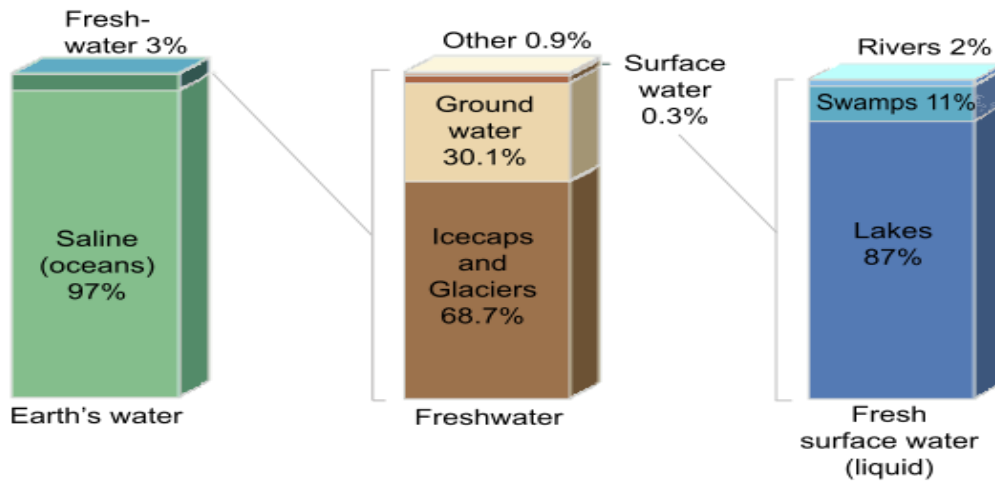
though there will be regional variations in rainfall. Overall, the global supply of freshwater will increase. (Dai et al 2002). Both droughts and floods may become more frequent in different regions at different times, and dramatic changes in snowfall and snow melt are expected in mountainous areas. (Held et al 2006). Although responsibility for the causes of climate change rests primarily with the developed and industrialised nations, the costs of climate change will be borne most directly by the poor. This is for a number of reasons, including:

- many of the region's most likely to be adversely affected fall in the developing world;
- the poor are disproportionately dependent on occupations, such as farming, fishing, that are adversely affected by climate change; and
- because the poor have very limited resources, they do not have the ability to adapt or cope significantly to climate change in the way that wealthier households can.

Climate change is occurring fastly. In 2005, the conference "Avoiding Dangerous Climate Change" for-raised concern that climate change is occurring more quickly than previously anticipated. Among the key findings of the conference were:

- Future emissions of greenhouse gases will raise temperatures by 1.4 to 5.8 degrees Celsius during this century.
- A change in ocean acidity is likely to reduce the ocean's capacity to absorb CO₂ from the atmosphere, thus compounding the effects of climate change, and will affect the entire marine food chain.
- Large-scale, irreversible system disruption and the destabilisation of the Antarctic ice sheets are serious risks: changes to polar ice, glaciers and rainfall regimes have already occurred.

Distribution of Earth's Water



According to (Gu et al, 2007), the effects of minor levels of climate change are already being felt, with impacts across many economic sectors. While there will clearly be some gains from climate change (for example, agriculture in some northern regions should increase in productivity due to a rise in temperatures), most of the impacts will be negative, and gains and losses will not be evenly distributed. For example:

- **Water:** Rising global temperatures will lead to an intensification of the hydrological cycle, resulting in dryer dry seasons and wetter rainy seasons, and subsequently heightened risks of more extreme and frequent floods and drought. Changing climate will also have significant impacts on the availability of water, as well as the quality and quantity of water that is available and accessible. Melting glaciers will increase flood risk during the rainy season, and strongly reduce dry-season water supplies to one-sixth of the World's population.
- **Agriculture:** Declining crop yields are likely to leave hundreds of millions without the ability to produce or purchase sufficient food supplies, especially in Africa. At mid to high latitudes, crop yields may increase for low levels of change in temperature, but will decline at higher levels of temperature change.
- **Ecosystems:** Changing temperatures will cause ecosystems to shift – forests, land types and plant species will dieback in some areas as temperatures rise, but increase in other areas. However, in many cases, the pace of change in temperature may be too fast for ecosystems to adjust, resulting in the loss of forests and species.
- **Health:** Higher temperatures expand the range of some dangerous vector-borne diseases, such as malaria, which already kills one million people annually, most of whom are children in the developing world. Further, heat waves associated with climate change, and increases in water borne diseases, will result in increased health problems.
- **Coastlines:** Melting ice and thermal expansion of oceans are the key factors driving sea level rise. In addition to exposing coastlines, where the majority of the human population live, to greater erosion and flooding pressures, rising sea levels will also lead to

salt water contamination of groundwater supplies, threatening the quality and quantity of freshwater access to large percentages of the population, because much of the solar energy received by the Earth is used to drive the hydrological cycle, higher levels of solar energy trapped in the atmosphere will lead to an intensification of this cycle, resulting in changes in precipitation patterns. (Held et al 2000). These changes will result in increased floods and drought, which will have significant impacts on the availability of freshwater. These impacts on freshwater will be further compounded by rising sea levels, and melting glaciers.

Floods and drought

Warmer average global temperatures means greater evaporation, with a warmer atmosphere able to hold more moisture aloft that can fall as precipitation, increasing the potential for flooding.

According to (Huntington, 2006), there are a number of factors that contribute to flood risks implied by a warmer climate, including:

- more frequent wet spells in middle/ high latitude winters;
- more intense mid-latitude storms;
- increased frequency of extreme precipitation events;
- increased magnitudes of precipitation events of high intensity; and
- land use changes and surface degradation (for example, deforestation and urbanisation) (IPCC, 2007). The combination of more intense and frequent storms with land use changes is already proving to be deadly for the world's vulnerable population (Hoerling et al, 2006).

METHODOLOGY

Study area

The Ilaje and Ese Odo Local Government areas are the fishing communities of Ondo State with important potentialities in terms of food. The two local governments are located between Longitude 4° 20' E and 5° 08' E of the prime meridian and Latitude 5° 58' N and 6° 29' N of the Equator. They are bounded in the North by Ikale Local Government, to the south by the Atlantic Ocean, with a

coastline of about 80Km, to the west by Ogun State and to the east by Delta State. About 80% of the area is covered by water, swamp and flood plains. The area is characterized by a vegetation of white mangrove – *Aucennia Africana* and *Paspalum vaginatom*. Most of the flood plains of the coast lagoon are covered by *Typha avstrslis*, *Eichilochola sp Eichhornia crassipes* (water hyacinth). (Agbebi, 2007). The major means of transportation in the study area are motorised canoes, speed boats and paddled canoes. Most of the houses in the area are built on elevated platforms above water level. Primary data was used for this study which was collected using pre-tested and validated questionnaire. Five (5) fishing communities were used for this study and through random sampling; twenty (20) respondents were selected per community, making a total of 100 respondents in all. Collected data were analysed using statistical tools like averages and percentage distribution. This was done in order to make the study more informative and useful.

RESULTS AND DISCUSSION

AGE: The belief is that the age of an individual affects his/her mental attitude to risk taking and new ideas. Risk aversion is said to increase with age.

TABLE 1. Age of respondents:

Interval	No of Respondents	Freq. (%)
15-20	10	10.0
21-30	25	25.0
31-40	35	25.0
41-50	15	15.0
51-60	15	15.0
Total	100	100

Field survey 2010

The most productive ages of the respondents were between 21-40 years because the respondents have high mental alertness and physical stability.

Educational level

This is the period spent by the respondents acquiring education either within a formal school or adult literacy class. Education reduces the level of individual ignorance and in turn improves his ability to decode, make decision and process information.

TABLE 2. Educational level of respondents:

Educational Level	No of Respondents	Freq. (%)
No formal education	35	35.0
Adult literacy school	15	15.0
Primary school	28	28.0
Secondary school	12	12.0
OND/NCE	10	10.0
Total	100	100

Most of the fisher-folks are professional fisher-folks hence a high percentage has no formal education. (35%).

Marital status

TABLE 3. Marital status of respondents

Characteristics	No of Respondents	Freq. (%)
Single	10	10.0
Married	70	70.0
Divorced	12	12.0
Widowed	8	8.0

Total	100	100
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The high percentage of married women (70%) is an indication that the fisher-folks are permanent settlers in the area, all their activities revolve around the community and migration is a rare occurrence.

House-hold size

TABLE 4. House-hold size of respondents

Interval	No of Respondents	Freq. (%)
0-5	13	13.0
6-10	40	40.0
11-15	25	25.0
16-20	17	17.0
21-25	5	5.0
Total	100	100

The majority of the respondents have large house-hold size (40%). This is consistent to the fact that majority of the fishing families are polygamous and this translates to higher responsibilities and lots of pressure on the finances of the family.

TABLE 5. Fishing income of respondents

Income level (₦)	No of Respondents	Freq. (%)
10,000-20,000	5	5.0
21,000-30,000	15	15.0
31,000-40,000	30	30.0
41,000-50,000	50	50.0
Total	100	100

Most of the respondents have a high income level of 50% because that is the primary occupation in the riverine area and so can afford some basic needs of life with their fishing income.

TABLE 6. Off-fishing income of respondents

Income level (₦)	No of Respondents	Freq. (%)
10,000-15,000	30	30.0
16,000-20,000	55	55.0
21,000-25,000	10	10.0
26,000-30,000	5	5.0
Total	100	100

High number of respondents have very low off-fishing income ₦16,000- ₦20,000 (55%) which indicates that fishing is their main source of livelihood and the amount been realized from off-fishing activities is not adequate for the families.

TABLE 7. Cooperative membership

Membership	No of Respondents	Freq. (%)
Member	45	45.0
Non-member	55	55.0
Total	100	

This has always been recommended for people in the community. The purpose is to primarily cater for immediate needs of members and cross fertilization of ideas. 45% are members while 55% are non-members.

TABLE 8. Sources of loan

Sources	No of Respondents	Freq. (%)
Friends	10	10.0
Group contribution	20	20.0
Cooperatives	15	15.0
Relatives	28	28.0
Bank	2	2.0
Government lending scheme	15	15.0
Do not enjoy loan	10	10.0
Total	100	

From the study, it was observed that loan from relatives ranked the highest (28%) followed by group contribution (20%). The few respondents (2%) had access to bank loan which further explain why they live below the poverty line. Group contributions, Cooperatives and relatives ranked the highest. Unfortunately, the loans obtained from these sources are very small which in most cases are not enough for the respondents to boast their trade.

TABLE 9. Off-fishing activities of respondents (Coping Strategies)

Activities	No of Respondents	Freq. (%)
Net making and repairing	30	30.0
Making fish basket	15	15.0
Fish processing	10	10.0
Boat mending	8	8.0
Farming	12	12.0
Others (Tailoring, Carpentry, etc)	25	25.0
Total	100	

The above shows other activities the respondents are involved in to generate income. Due to the high rise in water level in the area, fishing which is the dominant activity in the area becomes very risky. Although it is still been done, but at a very minimum level.

DISCUSSION AND RECOMMENDATION

The people of Ilaje and Ese-Odo local government areas of Ondo State, Nigeria are predominantly fisher-folks because of the terrain of the environment. As a result of climate change, there is an increase in rising global temperature which leads to an intensification of the hydrological cycle resulting in dryer dry seasons and wetter wet seasons and consequently high risk of extreme flooding as it is been experienced at present in the study area. Also due to the thermal expansion of oceans, coastlines are been exposed to greater erosion and flooding. This is the case in the study area which is along the coastline of the Atlantic Ocean. This excessive high rise in water level and flooding has greatly reduced the economic activities of the fisher-folks who are predominantly fishermen/women.

This necessitated the study of examining the coping strategies of fisher-folks in this environment. The study argues that efforts at coping and adapting require a multi-

sectoral approach and concludes that, the following strategies can go along way in coping with the adverse effects of climate changes experienced in the country:

- appropriate policies and programmes that build adaptive capacities and resilience building mechanisms
- efforts that focus on better fishing practices, financial incentives for fisher-folks
- better convergence between different developmental programmes at multiple levels such as local, state and national

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