



# AGRICULTURAL EXTENSION AND SUSTAINABLE FAMILY FARMING IN NIGERIA

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## Climate Induced Changes on Fishing Activities of Artisanal Fisher Folks in the Coastal Area of Ogun State

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### Abstract

The climate induced changes on the fishing activities of artisanal fisher folks was investigated in Ogun Waterside Local Government Area of Ogun State. Data were obtained from one hundred and twelve fisher folk using simple random sampling technique. Data analysis was done through the use of descriptive and inferential statistics (Chi-square, t-test) at  $p=0.05$ . Findings show most respondents were male (90.2%), married (90.2%) and mostly used family labour (80.3%). Most (69.6%) of the respondents used fishing net of various mesh sizes and 72.3% of the fisher folk used unmotorized boats and traditional sailing. Factors influencing changes in fishing activities include reduction in volume of fish catch (79.5%), damage of nets and boats by ocean surges (50.4%), wind storm (59.8%), flooding of dwelling house and farms (54.8%) and problem of fuel wood (81.3%). Coping strategies embarked upon by the fisher folks to combat the effect of climate change were channelization of beels to Atlantic ocean (90.2%), construction of plank foot bridges (83.9%) and the use of hard wood to construct canoes (61.6%). More than half of the respondents (56.2%) had unfavourable perception of climate change on the extinction of fish species. There were significant relationship between age ( $\chi^2=7.730$ ), household size ( $\chi^2=155.479$ ) and volume of fish caught. There was a significant difference between the volume of fish caught ten years ago and now ( $t=22.427$ ). Climate change has impacted negatively on the fishing activities of the artisanal fisher folks. It is recommended that metrological stations need to be resuscitated and well equipped in human resource and modern equipment to function effectively in climate information dissemination.

**Keywords:** Climate change, fisher folk, fishing activities.

## Introduction

Climate is the state of atmosphere, which is created by weather events over a period of time. The effect of climate on agriculture is related to variability in local climates rather than in global climate pattern (Fraser, 2008). Climate change refers to some observable variations in the climate systems that are attributable to human (anthropogenic) activities especially those that alter the atmosphere composition of the earth and ultimately lead to global warming (Opele, 2008). Global warming can lead to the rise in sea levels as oceans warm and glacier melt, thereby threatening agricultural productivity and human settlements.

Global climate change has presently been attracting widespread international concern as it poses a serious challenge to social and economic development. Climate change is having an impact on oceans, seas, lakes and rivers and on the fish that are found and/or cultured in them. Fisheries sector is a significant aspect of Nigeria food system accounting for 40 percent of the population's annual protein intake. The importance of fishing to the economy is also observed in the population of economically active people engaged in this sector fishing generates income and employment to thousands of people and trade in fishery products contribute to poverty reduction and National Economic Growth (Ibidun, 2008)

Artisanal fisheries in Nigeria coastal waters have been affected by climate variability and climate changes in recent years more than ever before (NIMET, 2008, Adebayo, 1991). The Intergovernmental Panel on Climate Change (IPCC 2007) recognizes the Nigeria coast as one of the low-lying lagoon coasts in western Africa which is likely to experience severe effects from flooding as a result of rising sea levels and climate changes. Increased frequency and intensity of storm surges from the Atlantic Ocean and changes in wave climate observed in recent years have had serious negative impacts on fishing activities and well-being of fisher folks. Storms surges damage/destroy fishing boats and fishing gears including nets where they are kept on the beaches. Affected fishermen are usually incapacitated as they are no longer able to fish until boats and nets are either repaired or replaced. For most of the fishermen, this is not easily achieved.

The occurrence of floods consequent upon changing rainfall patterns and storm surges in this coastal area have varied socio-economic impacts that are experienced at different levels-individual, household and whole community. There may be restriction of movement due to flood waters within communities and on pathways leading out to communities. At the peak of the floods, flood heights of up to 1.3 meters have been recorded along pathways leading out of the communities. This is especially challenging for women who are hindered from taking processed fish to markets. Little children are similarly prevented from going to school because of flood levels above their heights and flooding of dwelling houses and kitchen for fish processing which can cause loss of alternate fish source in the beels due to contamination by sea water. The scenario above represents what is experienced in Ogun Waterside Local Government Area of

Ogun state being largely a coastal community populated by fisher folks. Therefore the study examined climate induced change on fishing activities of fisher folks along the coastal area in Ogun Waterside Local Government Area of Ogun state.

The specific objectives were to:

- 1 describe the socio-economic characteristics of fishers in the study area.
- 2 determine the sources of information available to the respondents.
- 3 Ascertain the volume of fish they harvested ten years ago and now.
- 4 determine the perception of respondents to climate change on fish extinction.
- 5 examine the coping strategies used by fisher folks.
- 6 Identify factors influencing changes in the volume of fish harvested

### **Methodology**

Ogun Waterside is one of the twenty Local Government Areas (LGA) of Ogun state, Nigeria. The LGA is bounded in west by Ijebu East LGA, in the north and east by Ondo state and in the south by Lagos state and the Atlantic Ocean. The Local Government covers an area of about 860.32 square kilometers. It is the only local government that links Ogun state with the Atlantic Ocean. It has some towns and villages on the fringes of lagoon and Atlantic condition conducive for riverine, lagoon and marine artisanal fisheries. The traditional occupation of the inhabitants is fishing. The target population of this study is the fishers in the coastal area of the LGA. Purposive sampling was used to select ten (10) villages out of the twenty-three (23) villages in the coastal area of the LG based on the population of fisher folks. In each of the ten villages, random sampling was used to select 26% of the fishers, making a total of one hundred and twelve (112) respondents. Interview guide was used to collect data. The variables measured include respondents' sources of information using a three-point Likert-type scale of regularly (2), sometimes (1) and never (0). These values were added and mean was calculated. A similar method was adopted for factors influencing changes in volume of fish harvested; large extent (2), lesser extent (1) and not a factor (0). Perception of climate change on the extinction of fish species was measured using a three-point scale of agree, undecided and disagree with a score of 2, 1 and 0 respectively for positive statements and reverse order for negative statements. Response scores to the statements were summed and mean was calculated. A three-point likert type scale of always (2), occasional (1) and never (0) was used for respondents' coping strategies to climate. The values were added and mean was calculated.



## Results and Discussion

### *Socio economic characteristics of respondents*

From Table 1, the respondents were preponderantly males (90.2%), showing that fishing in the area is a male dominated occupation which could be consequent on the physical nature of its activities that require some level of energy exertion that is inherent in males. The result also indicated fishing to be a family activity as almost all (98.2%) the respondents (male and female) engaged in one fishing activity or the other. Moreover, it is not uncommon for the children of fisher folks to take after their parents. Marriage confers responsibility as reported by Akinbile (2007), it follows that the majority (90.2%) of fisher folks who were married engage in fishing activities so as to be able to provide for their household needs. Since fishing is a family activity hence the use of family labour (80.3%) as the major source of labour. It was also revealed that 78.4% of respondents earned income below ₦10,000, 15.2% earned between ₦10,000-₦15,000 and 5.4% earned ₦15,000 and above. Most of the respondents (59.9%) had 20-49 years of fishing experience. The low level of income is not commensurate with their experience in fishing activities. It is expected that the longer the years of fishing, the higher their income should be. This could be traced to the fact that the majority (78.4%) whose income are still below ₦10,000 were fisher folks who use simple unmotorized, hand operated traditional canoes and gears. Adeokun (2001) stated that such local technologies are not efficient enough to support commercial fish production, which can help to boost their income.

**Table 1: Distribution of respondents by personal characteristics**

| <b>Variables</b>                           | <b>Categories</b>   | <b>Percentage</b> |
|--|---------------------|-------------------|
| <b>Sex</b>                                 | Male                | 90.2              |
|  | Female              | 9.8               |
| <b>Age</b>                                 | Less than 30        | 8.0               |
|  | 30 – 39             | 17.9              |
|  | 40 – 49             | 30.4              |
|  | 50 - 59             | 24.1              |
|  | 60 and above        | 19.6              |
| <b>Marital status</b>                      | Married             | 90.2              |
|  | Single              | 8.0               |
|  | Divorce             | 0.9               |
|  | Widows              | 0.9               |
| <b>Primary occupation</b>                  | Fish catching       | 75.0              |
|  | Fish processing     | 14.3              |
|  | Fish marketing      | 8.9               |
|  | Civil servant       | 1.8               |
| <b>Secondary</b>                           | Farming             | 70.5              |
|  | Lumbering           | 8.9               |
|  | Tailoring           | 1.8               |
|  | Mat making          | 9.8               |
| <b>Education</b>                           | Non-formal          | 38.4              |
|  | Adult literacy      | 12.5              |
|  | Primary education   | 31.3              |
|  | Secondary education | 17.0              |
|  | Tertiary            | 0.9               |
| <b>Experience</b>                          | Less than 20        | 34.8              |
|  | 20 – 29             | 28.6              |
|  | 30 – 39             | 18.8              |
|  | 40 – 49             | 12.5              |
|  | 50 and above        | 5.4               |
| <b>Labour source</b>                       | Family labour       | 80.3              |
|  | Friends             | 6.3               |
|  | Paid wages          | 13.4              |
| <b>Income per week<br/>(profit margin)</b> | Less than 10,000    | 78.4              |
|  | 10,001 – 15,000     | 16.2              |
|  | 15,000 and above    | 5.4               |

### Levels of knowledge of respondents on climate change

Knowledge of respondents on climate change is presented in Table 2. The study reveals that of the average obtainable score of 9.00, the average knowledge level was 7.21, which is an indication of high level of knowledge of climate change among respondents. The frequency and percentage distribution of respondents reveals that The majority of the respondents (86.6%) had high knowledge of climate change while only 13.4% had low knowledge.

**Table 2: Knowledge of respondents on climate change**

| Knowledge statement<br>True   |            |
|---|------------|
| Warm water temperature (due to high intensity of sunlight) noticed in the recent time is associated with climate change | 96.4       |
| Excessive rainfall in recent time is due to climate change  | 99.1       |
| Increase in temperature experience in coastal areas is as a result of climate change                                    | 63.4       |
| Reduction of some fish species due to warm water is the effect of climate change  | 90.2       |
| Change in the timing and amount of rainfall being experienced recently is due to climate change                         | 97.3       |
| Rise in sea level is caused by climate change   | 86.6       |
| Decrease in the volume of fish catch nowadays is caused by climate change   | 100        |
| Excessive flooding of dwelling house and foot path in coastal areas is the effect of climate change                     | 100        |
| <b>Mean level of knowledge =7.21, SD =3.12, High = 86.6, Low =13.4</b>  | <b>100</b> |

Source: Field Survey. 2014

### Sources of information on climate change

Table 3 shows the respondents' sources of information on climate induced changes on fishing activities in the study area. Cooperative society ranked 1<sup>st</sup> was the most popular source of information on climate induced changes on fishing activities to the respondents. This finding is quite logical, because they all belong to cooperative societies, which are also involved in the provision of finance for necessary fishing operation equipment such as motorized boats, fishing nets, smoking kiln and processing equipment that add value to their produce, thus enhance large scale production. Various associations to which the respondents belong to and hold meetings fortnightly or on monthly basis, ranked 2<sup>nd</sup> in the order of importance of information source.

Radio, which is one of the supported and quickest means of information to farmers (Adekunle, 1993) was ranked 3<sup>rd</sup> most important source of information to the respondents. The findings further reveal that respondents sourced information from extension agents ranked 7<sup>th</sup>. Opele (2002) reported that extension services are crucial to the adoption of fisheries innovations, adding that the better the quality of extension services to the fisher folks, the better would be their improvement in fisheries operations. Newspapers which had a mean score of 1.09 ranked last (10<sup>th</sup>); this may be consequent on the availability of less agricultural information in most of the newspapers.

**Table 3: Frequency of receipt of information on climate induced changes on fishing activities**

| S/N | Sources            | Regularly | Sometimes | Never | Mean | Rank |
|-----|--------------------|-----------|-----------|-------|------|------|
| 1.  | Cooperative        | 36.6      | 5.4       | 58.0  | 1.87 | 1    |
| 2.  | Association        | 33.9      | 8.9       | 57.1  | 1.79 | 2    |
| 3.  | Radio              | 38.4      | 13.4      | 48.2  | 1.74 | 3    |
| 4.  | Middlemen          | 5.4       | 2.7       | 92.0  | 1.66 | 4    |
| 5.  | Friends/Colleagues | 21.4      | 16.1      | 62.5  | 1.57 | 5    |
| 6.  | Meetings           | 23.2      | 23.2      | 63.6  | 1.50 | 6    |
| 7.  | Extension agent    | 3.6       | 4.5       | 92.0  | 1.44 | 7    |
| 8.  | Informal           | 2.7       | 8.0       | 89.3  | 1.25 | 8    |
| 9.  | Television         | 5.4       | 17.0      | 77.7  | 1.24 | 9    |
| 10. | Newspaper          | 1.8       | 17.9      | 80.4  | 1.09 | 10   |

Source: Field Survey, 2014

### Factors influencing changes in fishing activities

The factors influencing changes in fishing activities and volume of fish (Table 4) is inability to replace damaged nets and boats (ranked 1<sup>st</sup>). This is quite pertinent in that just as a crop farmer cannot do without a hoe, so it is to a fisherman without his net for instance. This leaves them incapacitated as they will be able to do little or nothing until the boats and nets are replaced or repaired. Reduction/changes in the volume of fish caught ranked 2<sup>nd</sup> which could be occasioned by windstorms and ocean surges (3<sup>rd</sup>) all as a result of changing rainfall pattern in the area. Ibidun (2008) averred that floods in coastal communities consequent upon rising sea levels, storm surges and increasing rainfall during rainy months has also become a major threat to coastal dwellers. This can cause flooding of farmlands (4<sup>th</sup>), flooding of foot paths (5<sup>th</sup>) and flooding of houses (6<sup>th</sup>). These have varied socio-economic effects on individual households and the community as a whole such as loss of food plants, reduced income and restriction of movement.

**Table 4: Factors influencing changes in fishing activities and volume of fish**

| Factors                                     | Regularly | Sometimes | Never | Mean | Rank |
|---|-----------|-----------|-------|------|------|
| Inability to replace damaged nets and boats | 19.6      | 80.4      | 0     | 1.80 | 1    |
| Reduction/changes in volume of fish caught  | 19.5      | 79.5      | 0.9   | 1.76 | 2    |
| Windstorms and ocean surges                 | 53.8      | 26.8      | 13.4  | 1.70 | 3    |
| Flooding of farmlands                       | 19.6      | 72.3      | 8.0   | 1.64 | 4    |
| Flooding of foot paths                      | 15.2      | 84.8      | 0     | 1.55 | 5    |
| Flooding of houses                          | 50.9      | 49.1      | 0     | 1.49 | 6    |
| Salt water intrusion                        | 50.9      | 39.3      | 8.9   | 1.39 | 7    |
| Low level of marketable of fish             | 60.7      | 36.6      | 2.7   | 1.33 | 8    |
| Problem of fuel wood                        | 13        | 15.2      | 3.6   | 1.12 | 9    |
| Change in sea level                         | 47.3      | 16.1      | 36.6  | 0.79 | 10   |

Source: Field Survey, 2014

**Volume of fish caught ten years ago and now by respondents**

The results in Tables 5a and 5b show the volume of fish caught in the past ten years and the current volume of fish caught respectively. During the dry season, the percentage of those who caught between 20-29 and ≥30 baskets of fish per week ten years ago dropped significantly from 62.5% to 4.5% and 6.2% to 0% respectively, whereas the volume of fish caught between 10-29 and 0-10 increased significantly from 30.4% to 58.9%, 0.9% to 36.6%. In a similar vein, during the wet season, the percentage of those who caught between 20-29 and ≥30 baskets of fish per week ten years ago dropped significantly from 41.1% to 0.9% and 8.0% to 0% respectively, whereas the volume of fish caught between 10-19 and 0-9 increased from 50.9% to 53.6% and 0% to 45.5%, respectively. The result shows a sharp decrease in the volume of fish caught ten years ago and now. This could be attributable to changing climatic conditions and can lead to fluctuations in protein supply, low income and probably loss of livelihood within fisher folk household.

**Table 5a: Distribution by volume of fish caught ten years ago**

| Volume of fish in basket(per week) | Dry Season |      |     |      | Wet Season |      |      |      |
|------------------------------------|------------|------|-----|------|------------|------|------|------|
|                                    | %          | Max  | Min | Mean | %          | Max  | Min  | Mean |
| Less than 10                       | 0.9        |      |     |      | 0          |      |      |      |
| 10-19                              | 30.4       |      |     |      | 50.9       |      |      |      |
| 20-29                              | 62.5       | 30.0 | 5.0 | 20.9 | 41.1       | 40.0 | 10.0 | 19.9 |
| 30 and above                       | 6.2        |      |     |      | 8.0        |      |      |      |
|                                    | <b>100</b> |      |     |      | <b>100</b> |      |      |      |

**Table 5b: Present volume of fish caught by respondents**

|              |            |      |     |      |            |      |     |     |
|--------------|------------|------|-----|------|------------|------|-----|-----|
| Less than 10 | 36.6       |      |     |      | 45.5       |      |     |     |
| 10-19        | 58.9       |      |     |      | 53.6       |      |     |     |
| 20-29        | 4.5        | 23.0 | 2.0 | 10.5 | 0.9        | 21.0 | 1.0 | 9.7 |
| 30 and above | 0          |      |     |      | 0          |      |     |     |
|              | <b>100</b> |      |     |      | <b>100</b> |      |     |     |

Source: Field Survey, 2014

**Table 5b: Present volume of fish caught by respondents**

|              |            |      |     |      |            |      |     |     |
|--------------|------------|------|-----|------|------------|------|-----|-----|
| Less than 10 | 36.6       |      |     |      | 45.5       |      |     |     |
| 10-19        | 58.9       |      |     |      | 53.6       |      |     |     |
| 20-29        | 4.5        | 23.0 | 2.0 | 10.5 | 0.9        | 21.0 | 1.0 | 9.7 |
| 30 and above | 0          |      |     |      | 0          |      |     |     |
|              | <b>100</b> |      |     |      | <b>100</b> |      |     |     |

Source: Field Survey, 2014

### Perception of the effect of climate change on the fish catch

Table 6 indicates that the respondents' perception mean score was 1.81. Result from the study shows that the respondents were favourably disposed to the fact that destruction of fish breeding ground was as a result of climate change (mean = 2.82), effect of climate change lead to diversification to other income generating activities (mean = 2.74), reduction in fish catch is due to climate change (mean = 2.67), climate change lead to migration of some fish species ( mean = 2.63), Ocean surges due to climate change resulted in destruction of canoes and gears ( mean = 2.61), effect of climate change lead to low yield ( mean = 2.58), effect of climate change results in extinction of some fish species (mean = 2.55) and rise in sea level as a result of climate change lead to low income (mean = 2.53). However, respondents in the study area have unfavourable perception to the following: Climate change leads to surplus of some fish species (mean = 1.61), Difference in pattern of rainfall due to climate change resulted in low fish catch and income ( mean = 0.81), effect of climate change leads to increase in water level (mean = 1.42), Climate change leads to adoption of different fishing gears (mean = 0.68), Windstorm renders some fishermen homeless ( mean =0.61) and Climate change resulted in change of fishing time and duration (mean = 0.57). Meanwhile, 56.2% of the respondents had unfavourable perception of the effect of climate change on extinction of fish species while 43.8% had favourable perception of climate change effect. This suggests the need for awareness on the effect of climate change among fisher folks in the study area.

**Table 6: Perception of effect of climate change on the fish catch**

| S/N | Statements  | Statement Mean | Favourable | Unfavourable | Overall Mean |
|-----|---|----------------|------------|--------------|--------------|
| 1.  | Effect of climate change lead to low yield  | 2.58           |            |              |              |
| 2.  | Rise in sea level as a result of climate change. lead to low income                           | 2.53           |            |              |              |
| 3   | Destruction of fish breeding grand as a result of climate change                              | 2.82           |            |              |              |
| 4   | Reduction in fish catch due to climate change result in Migration of fisher folks             | 2.67           |            |              |              |
| 5   | Effect of climate change leads to increase in water level                                     | 1.42           |            |              |              |
| 6   | Effect of climate change extinction of some fish species                                      | 2.55           |            |              |              |
| 7   | Climate change leads to surplus of some fish species  | 1.61           |            |              |              |
| 8   | As a result of climate change fisher folks travel for away from their dwelling house to catch | 2.63           | 43.8       | 56.2         | 27.2         |
| 9   | Climate change leads to adoption of different fishing gears                                   | 0.68           |            |              |              |
| 10  | climate change lead to migration of some fish species   | 2.63           |            |              |              |
| 11  | Effect of climate change lead to diversification of other generating activities               | 2.74           |            |              |              |
| 12  | Ocean surges due to climate change resulted in destruction of canoes and gears                | 2.61           |            |              |              |
| 13  | Windstorm renders some fishermen homeless   | 0.61           |            |              |              |
| 14  | Climate change leads to increase in income  | 0.79           |            |              |              |
| 15  | Climate change leads to change in fishing method  | 0.57           |            |              |              |
| 16  | Climate change resulted in change of fishing time and duration                                | 0.57           |            |              |              |
| 17  | Difference in pattern of rainfall due to climate change resulted in low fish catch and income | 0.81           |            |              |              |

#### **Coping strategies by fisher folks**

The major coping strategies utilized by the respondents were; channelization of beels into Atlantic Ocean to reduce the effect of flooding (mean = 4.24), construction of plank foot bridges across foot path ways (mean = 3.48), diversifying to other income generating activities (mean = 3.15), the use of hard wood to construct canoe in order to cope with the effect of climate change (Mean = 3.04), the use of motorized boat to reduce postharvest loss (mean = 2.68), formation of cooperatives to source for credit (mean = 2.64), removal of nets/boat from sea shore after landing (mean = 2.56) and change in time of fishing due to rise in temperature ( mean = 2.55). However, measures with low mean score



were considered not effective. This included: Regular training on net fabrication and maintenance (mean = 1.92), Provision of enough fuel and food during fishing, (mean = 1.74), Change to inland fishing when sea is rough (mean = 1.68), changing method of fishing activities (mean = 1.43), increase in the number of crew/labour (mean = 1.38), group fishing as against individual fishing (Mean = 1.34) and the use of modern smoking kiln (mean = 1.10).

**Table 7: Distribution according to coping strategies utilized by Fisher folk**

| S/N | Statement  | M    | Rank |
|-----|--|------|------|
| 1   | Channelization of beels to Atlantic ocean to reduce the effect of flooding       | 4.24 | 1    |
| 2   | Construction of plank foot bridges   | 3.48 | 2    |
| 3   | Diversification to other income generating activities e.g. coconut, trading etc. | 3.15 | 3    |
| 4   | Use of hard and floating wood for boat construction                              | 3.04 | 4    |
| 5   | Use of motorized boat to reduce post-harvest loss                                | 2.68 | 5    |
| 6   | Formation of cooperatives to source for credit                                   | 2.64 | 6    |
| 7   | Removal of nets/boat from sea shore after landing                                | 2.56 | 7    |
| 8   | Destruction of breeding ground led to moving further to the sea shore            | 2.50 | 8    |
| 9   | Use of cloth sail against windstorm  | 2.38 | 9    |
| 10  | Change in time of fishing due to rise in temperature                             | 2.36 | 10   |
| 11  | Regular training on net fabrication and maintenance                              | 1.92 | 11   |
| 12  | Provision of enough fuel and food during fishing                                 | 1.74 | 12   |
| 13  | Change to inland fishing when sea is rough                                       | 1.68 | 13   |
| 14  | Changing method of fishing activities  | 1.43 | 14   |
| 15  | Increase in number of crew division of labour                                    | 1.38 | 15   |
| 16  | Group Fishing as against individual fishing                                      | 1.34 | 16   |
| 17  | Use of modern smoking kiln   | 1.10 | 17   |

*Grand mean = 2.26*

**Relationship between respondents' personal characteristics and volume of fish caught**

Table 8 shows the results of the Chi-square for the socioeconomic characteristics of the respondents and volume of fish caught. The results show that volume of fish caught is significantly related to age ( $\chi^2=7.730$ ,  $p=0.005$ ) and household size ( $\chi^2 =155.479$ ,  $p=0.029$ ). It follows that a respondent's age is vital to the volume of fish caught in that a fisherman should not be too old or too young but possess enough strength and experience gain to perform fishing activities as they grow older. The result also explains that respondents with larger household size would enjoy labour support i.e family farming from their households which can thus help to boost production.

**Table 8: Relationship between personal characteristics of respondents and volume of fish caught**

| Variable        | Df | $\chi^2$ value | p-value |
|-----------------|----|----------------|---------|
| Age             | 1  | 7.730          | 0.005   |
| Household Sizes | 1  | 155.479        | 0.029   |

*Source: Field survey, 2014*

**Difference between volumes of fish caught ten years ago and now**

The result in Table 9 shows that there is a significant difference between the volume of fish caught ten years ago and now ( $t=22.427$ ,  $p=0.000$ ). This difference as stated earlier is as a result of a significant reduction in the volume of fish caught which is attributable to changing climatic conditions that could then lead to fluctuations in protein supply, low income and probably loss of livelihood. Adger *et al* (2003) reported that a combination of high climatic variability, excess rainfall, etc. cause reduction in agricultural yield, low productivity and a range of other problems.

**Table 9: Difference between volumes of fish caught ten years ago and now**

| Variable                      | t-value | p-value |
|-------------------------------|---------|---------|
| Volume of fish before and now | 22.427  | 0.000   |

*Source: Field survey, 2014*

## **Conclusion and Recommendations**

The study established that fisher folk in the study area are exposed to various effects of climate change on fish production directly or indirectly. This is evident as they unfavourably perceived the effects on their productivity coupled with a sharp decrease between the volume of fish caught ten years ago and now. However, they were able to adapt various coping strategies to combat the effect of climate change on fish production. The study therefore, recommends the need for proper enlightenment programme on climate change to create more awareness in coastal and among rural areas. In addition, efforts should be made in resuscitating metrological stations as well as equipping them with human, modern equipment and financial capital so as to give accurate predictions on climate change

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## References

- Adebayo, W. O., 1991. Temperature trends and variability in Nigeria. M.Sc thesis, University of Ibadan, Nigeria.
- Adekunle, O. A. 1993. Analysis of indigenous practices of small-scale plantation farmers for appropriate alley farming technology in Oyo State. An unpublished PhD Thesis in the Department of Agricultural Extension, University of Ibadan.
- Adger, W.N., Huq, S., Brown, K., Conway, D. and Hulme, M. 2003: "Adaptation to Climate Change in the Developing World" *Progress in development studies* 3(3):179-195.
- Akinbile, L. A. 2007: Socio-Economic and Health Related Constraints of Oil Palm Processors in Osun State, Nigeria, The Nigerian Journal of Rural Extension and Development, Vol. 2, 1-8. (Nigeria) (100% Contribution).
- Fraser, E. 2008. "Crop yield and Climate change" retrieved from Sept. 16, 2010 from [http://www.fao.org/waicent/fao/agricult/gal/wrpr/Nigeria\\_bright.htm](http://www.fao.org/waicent/fao/agricult/gal/wrpr/Nigeria_bright.htm)
- Intergovernmental Panel on Climate Change [IPCC] (2001): *Climate change third assessment report working group II: impacts, adaptation and vulnerability*. Cambridge University Press, Cambridge.
- Intergovernmental Panel on Climate Change 2007: *The Physical Science Basis. Contribution of working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Solomon, S.D, Qni, M. Manning (eds)) [http://ipcc.wgl.ucar.edu/wg1\\_report.html](http://ipcc.wgl.ucar.edu/wg1_report.html).
- NIMET, 2008 Nigeria climate review bulletin 2007. Nigerian Meteorological Agency Nimet No 001.
- Opele, A. I. 2010: factors influencing the adoption of improved fisheries technologies in artisanal fisheries in Ogun waterside Local Government. B.Sc Ed.(Agric Extension option) Thesis in Department of Agricultural Extension and Rural Sociology, Olabisi Onabanjo University Ago- Iwoye, Ogun State, Nigeria pp10-28.