

Comparative analysis of flood management strategies adopted by rural households in Ondo and Oyo states Nigeria.

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Abstract

Actions to reduce the consequences of flooding on the rural dwellers vary from place to place. The study compared the flood management strategies adopted by rural households in Ondo and Oyo states Nigeria with a focus on the forms of flooding, measures to reduce the occurrences and consequences on rural livelihoods. A multistage sampling procedure was used to select 120 respondents used for the study. Data obtained were analyzed using descriptive statistics and T-test. Findings show that 98.9% and 51.1% of the respondents from Ondo and Oyo states experienced fluvial flooding, 41.1% and 48.9% suffered from pluvial flooding in Ondo and Oyo states respectively while 33.3% of the respondents in Ondo state experienced coastal flooding. The management strategies employed in Ondo & Oyo states respectively include: dredging waterways (62.22 and 61.11%), erosion control (88.9 & 87.8%), construction of barriers (66.67 & 65.7%), and construction of bridges (44.1 & 30.0%). The t-test established significant differences in the effectiveness of flood management practices adopted in Ondo and Oyo States, (t -value=1.890) at 0.05 level. The study recommends regular sensitization programs to enlighten rural households on preventive measures to flooding, adherence to land policies for constructions and implement punitive measures on lawbreakers.

Keywords: Flooding, flood forms, Risk management, consequences of the flood.

Introduction

Flood is the most widespread of all the natural hazards to which humans are exposed, and it accounts for most damages and losses of life across the globe. For instance, between 1993 and 2013, flooding accounted for 43% of all the global natural disasters (Centre for Research on epidemiology of Disaster, CRED, 2015). According to the United Nations (2019), flooding affected more people in 2018 than other disasters, and were responsible for 24 percent of the total deaths from natural disasters in the same year. The effects of flooding on the victims and human settlements are devastating and costly (Musah and Akai, 2014). The Organization for Economic Cooperation and Development (OECD), affirmed that flooding affects nearly 250 million people worldwide and causes more than \$40 billion damages and losses annually.

According to the Integrated Research on Disaster Risk (IRDR, 2014) and UN, (2019) flood is a broad term to describe the overflow of water from a stream channel into normally dry land in the floodplain (riverine flooding), higher-than-normal levels along the coast and

in lakes or reservoirs (coastal flooding) as well as ponding of water at or near the point where the rain fell (flash floods)

The concerns for flooding and the associated consequences on humans are clearly of global significance, primarily when allied with the fears of climatic change and associated changes in rainfall events and sea-level rise (Kundzewicz, Kanae, Seneviratne, Handmer, Nicholls and Peduzzi, 2014).

Historically, according to Bashir, Oludare, Johnson and Aloysius (2012), flooding in Nigeria, which dates back to the early 1950s have been a significant concern, affecting rural areas and cities in the country.

According to the National emergency management Agency (2018), heavy rains across Nigeria caused large scale flooding which affected 826,403 people, destroyed 150,285 hectares Agricultural land, 17, 816 houses, and injured 1, 036 people. It also affected 176,299 Internally Displaced Persons and caused 199 deaths. According to NEMA, an estimate of 321 roads and Bridges were destroyed/ damaged by flood in 2018.

These hazards have a link with poor urban planning and climate change, especially in increased frequency and intensity of rainfall (Adeloye, and Rustum, 2011). Researches (Ogunbodede and Sunmola, 2014 Fadaïro and Ganiyu, 2010, NEMA, 2018), expressed that flood led to the loss of lives, physical injuries, widespread infection and vector-borne diseases, social disorders, and homelessness, this resulted in food insecurity, economic losses and economic disruption in Nigeria.

The adverse effects of flood call for a disaster risk reduction response to averse the effects on rural livelihoods in Nigeria. Disaster risk reduction is a conceptual framework that entails the development and application of policies and practices to lessen a population's vulnerabilities and disaster risks. It incorporates disaster preparedness, mitigation, and prevention within the broad context of a community's sustainable development (UNISDR, 2009; Intergovernmental Panel on Climate Change (IPCC, 2012). The underlying idea behind disaster risk reduction is to proactively manage disaster risk to minimize and ideally prevent its adverse impacts, as opposed to reacting to the disaster crisis. Hence, disaster risk reduction calls for upfront investments (Kellett & Sparks, 2012).

Disaster Management is strategic planning and procedure administered and employed to protect critical assets from severe damages when natural or human-made calamities and catastrophic events such as flood occurs. In the United States, Executive Order was established as a policy for the United States to have an active, reliable, integrated, flexible, and comprehensive system to alert and warn the general public, which is called "Integrated Public Alert and Warning System (IPAWS) (FEMA, 2011).

Disaster management plans are multidimensional and aimed to address such issues as floods, hurricanes, fires, bombings, and even mass failures of utilities or the rapid spread of disease (John, 2004). Emergency Management is a systematic process leading to action before, during and after a disaster to save lives and prevent injury (NCDHD, 2011). According to (NCDHD, 2011) Emergency Management is organized into four phases: Mitigation which are actions taken to eliminate a hazard or reduce its potential impact; Preparedness which includes planning

for major emergencies such as training and exercises; Response which are actions taken in response to emergencies; and Recovery which are actions taken after a disaster to restore services and reconstruct communities.

Flood management strategies are usually classified into two measures: the structural and non-structural control measure. The structural control measure according to Mladenović (2015) is concerned with environmental management and it entails controlling dams, detecting basins, levees or dike, diversion of flood channels, improving river channels and upper watershed management. The Non-constructional or non-structural measures deal with the society and it refers to behavioural adjustments which depend on certain pre-planned action by floodplain residents prior to a flood (Ologunorisa, 2009). Smith and Tobin (1979) identified six categories of the non-structural control measures. These include; Loss bearing or accepting the losses accruing from flooding, flood Forecasting and Warning Schemes; flood Abatement Schemes, flood-protection scheme; public relief funds; flood insurance and Floodplain zoning.

Accepting losses after a flood disaster is a negative response to flooding whereby the people involved made no attempt to adjust to the hazard, but replacing the lost or damaged goods. This strategy is very common in rural areas. Flood Forecasting and Warning Schemes involves three stages: these are evaluation, dissemination and response. The evaluation stage of flood-warning scheme involves the comprehension of hydrological and meteorological processes to formulate a suitable warning message revealing the arrival of flood the depth at its peak, duration and velocity of flow. Flood warning dissemination is confined to police touring the flood-prone area and broadcasting through mass media such as radio and television stations. The response is the reaction of people to information disseminated. According to Ologunorisa (2009) flood abatement scheme aims at reducing flood peaks downstream, by a

series of land-use changes upstream, to alter runoff and the timing of the flood hydrograph. It embraces land-use management in the upland catchment phase of runoff. The Flood-Protection Scheme entails temporary or permanent adjustments to building structure, and the contents of buildings to reduce the adverse effects of flood. Public Relief Funds are usually made available to people in flood prone areas to mitigate the impact of flood. At times, such relief funds might not be adequate to meet their needs. However, might be beneficial to the vulnerable individuals who suffered damages. Since flood is the number one natural disaster in most countries of the world, Flood insurance should be a necessity. Flood Insurance allows the payment of flood losses to be made over a period of years rather than all at a time. Flood insurance policy according to Insurance Information Institute (III, 2020) is way to protect assets most fully from the cost of flood damages and loss. (III, 2020) affirmed that flood insurance in the United States of America covers direct physical losses from floods and losses resulting from flood related erosion caused by waves or currents of water exceeding anticipated cyclical levels and accompanied by a severe storm, flash flood, abnormal tide surge or a similar situation that results in flooding. The maximum flood insurance coverage amount is \$250,000 for the structure of the home and \$100,000 for the contents of the home.

Floodplain zoning aims at reducing flood by controlling floodplain development, rather than altering the hydrological characteristics in anyway. This might involve a prohibitive zoning, restrictive zoning and warning zoning. A Prohibitive Zone is a place where there should be no further development, except for essential waterfront facilities. A Restrictive Zone restricts development to only certain essential ones and must ensure that all buildings are flood-proofed. A Warning Zones are areas where the inhabitants receive

warning of impending floods and the implications of flood hazards on regular basis.

In Nigeria, several strategies have been used to averse the adverse effect of flooding. Some of these include early warning, providing a master plan for flood control and relief measures for victims; use of laws and edicts; proactive planning in controlling development especially along the flood prone areas; improve institutional capacity for flood prediction and public awareness programmes and minimize the impact of floods through the provision and maintenance of appropriate infrastructure and providing relief funds (Agbonkhese, et al., 2014; Adetunji and Oyeleye, 2018).

Despite all these strategies, the occurrence of flood in Nigeria has not abated, rather, it worsens, rural households in Ondo and Oyo states were adversely affected by flood and there is a dearth of information on flood management strategies adopted by these categories of people. More so, the actions to reduce the consequences of flooding on the rural dwellers might vary from place to place. Hence, the study is embarked upon to compare the flood management strategies adopted by rural households in Ondo and Oyo states

The specific objectives are to:

- Ascertain the socioeconomic characteristics of the respondents in the study area;
- Identify the forms of floods that occurred in Ondo and Oyo States;
- Compare management strategies put in place to reduce the occurrence of flood and
- Compare the consequences of flooding on the livelihood of the respondents in Ondo and Oyo States.

Methodology

The study was carried out in Ondo and Oyo States, Nigeria. The two states are part of the South-west in Nigeria. Ondo State is located in the tropics. It is found between longitude $4^{\circ} 51'$ and $5^{\circ} 45'$ East of Greenwich meridian and $7^{\circ} 51'$ and $8^{\circ} 51'$ North of the equator. The state is mostly agrarian. Its land area is about

15,500km. It is bounded in the East, west, North and south by Edo, Ogun, Osun, Ekiti and Kogi states, as well as the Atlantic Ocean respectively. Approximately, the population of Ondo state in 2016 according to National Population Commission (NPC, 2017) was 4,671,695.

Oyo State has its capital situated in Ibadan. The state is bounded in the North by Kwara State, in the East by Osun State, in the south by Ogun State and in the west partly by Ogun State and Republic of Benin. The state covers approximately an area of 28,454 square kilometres. The landscape consists of old hard rocks and dome-shaped hills, which rise gently from about 500 meters in the southern part and reaching a height of about 1,219 meters above sea level in the northern part. The State is 8° 19' 60" North, 3° 2' 30" East. The population of Oyo state was approximately 7,840,864 in 2016 (NPC, 2017).

Analysis techniques

Data analysis was done with Descriptive statistics such as frequency counts, percentages, Mean and T-test. The mean was determined using a five point likert-type scale with scores of 5, 4, 3, 2 and 1 points for strongly agree, agree, undecided, disagree and

The population of the Study

The population of the study was rural households living in flood-affected areas in Ondo and Oyo States. A Multistage sampling procedure was used in the study. The stages involved the purposive selection of three (3) Local Government Areas and three communities affected by flood from each state. Finally, ten households were selected through snowball method from each community. Thus, a total of 120 households were sampled for the study. The data were collected with the use of a structured questionnaire. It comprises of open-ended and close-ended questions. It was used to elicit information from the respondents. Data were collected from respondents by the researcher and enumerators who were trained on the content of the questionnaire.

strongly disagree respectively. The benchmark was a mean point score of 3.0. Therefore, any score lesser than the mean score ($\bar{x}=3.0$) were considered unfavourable or not relevant while the variables found to be equal or greater than the mean score ($\bar{x}=3.0$) were regarded as favourable or relevant.

$$LS = (N_5X_5 + N_4X_4 + N_3X_3 + N_2X_2 + N_1X_1) / (N)$$

Where:

LS = Likert Scale

N = Total number of respondents.

N₁ = Number of rural households who strongly disagree with the perception statement.

N₂ = Number of rural households who disagree with the perception statement

N₃ = Number of rural households who neither agree nor disagree with the perception statement

N₄ = Number of rural households who agree with the perception statement

N₅ = Number of rural households who strongly agree with the perception statement

T-test

The T-test shows the difference between flood management strategies adopted by Rural households in Ondo and Oyo states.

The Basic formula is as follows: -

$$T = \frac{\frac{X_1}{N_1} - \frac{X_2}{N_2}}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where:

X_1 = The mean of group 1

X_2 = The mean of group 2

S_1 = Standard deviation for group 1

S_2 = Standard deviation for group 2

N = Size of each group

Results and Discussion

The result in Table 1 shows that, the majority (80.0% and 71.7%) of the respondents from the two states (Ondo and Oyo respectively) were male. The mean age of the respondents was 51 and 53 years, an implication of being young and within the active age and are expected to be able to understand the issues of flooding and develop strategies to cope with it. The respondents cut across all the religious practices in the area, with Ondo state being dominated by Christians and Oyo state dominated by Muslims. The marital status of the respondents from the two states were similar (81.7 and 86.6% married) and they both had a mean household sizes of six persons. It shows that a large proportion of the respondents from the study area had relatively large household sizes. A large household size according to Adebo and Ajiboye, (2014), might portend higher expenditure on basic needs to the detriment of other higher needs. Hence, it might affect the response of the respondents to flooding management strategies. There were more people with formal education from Ondo state than Oyo state. Meanwhile, only a few (35%) and (40%) of the respondents in Ondo and Oyo States respectively primarily engaged in a non-agricultural occupations as a source of livelihood. It indicated that the principal occupations of the respondents in Ondo state

were farming while Oyo State though practised farming, but engaged more in non-agricultural occupations such as civil servant, artisan and trading. The mean farm sizes of the respondents were 1.15 ± 0.86 and 1.2 ± 0.33 in Ondo and Oyo States, respectively, an indication that they were mostly small scale farmers. The findings show that a large proportion of the respondents in both states were small scale farmers. These findings corroborate the findings of Adebo and Ajiboye (2014) that the majority of the rural households operate on less than 1 hectare of farmland. It is expected to affect their income.

Also the mean annual income of the respondents were similar (₦263,666.67 and ₦287,000.00, an equivalent of \$680.43 and \$740.65 per annum and \$1.86 & \$2.02 per day). It shows that most of the respondents in Ondo state are living below the poverty line of less than \$1.90 a day while their counterparts from Oyo state are just a little bit above the poverty line. It confirmed the assertion of World Bank Group (2020) that over 10 percent of the world's population or 734 million people lived on less than \$1.90 a day. The low income level will definitely affect their standard of living and as well as their response to flooding management strategies.

Table 1: SOCIO-ECONOMICS CHARACTERISTICS OF THE RESPONDENTS

VARIABLE	Freq.	%	Mean	Freq.	%	Mean
Gender						
Male	48	80.0		43	71.7	
female	12	20.0		17	28.3	
Age						
≤ 40 years	7	11.7		15	25.0	
41 – 60 years	34	56.6	51.5	40	66.7	53.2
> 60 years	19	31.7	SD±9.54	5	8.3	SD±8.61
Religion						
Christian	48	80.0		27	45.0	
Islam	12	20.0		33	55.0	
Marital status						
single	8	13.3		2	3.3	
married	49	81.7		52	86.7	
widow	3	5.0		6	10.0	
Household size						
≤ 5	14	23.3		9	15.0	
6 – 8	36	48	6.4	41	68.3	6.5
> 9	10	5	SD± 1.69	10	16.7	SD± 1.61
Level of education						
No formal education	13	21.7		21	35.1	
Primary education	18	30.0		14	23.3	
Secondary education	21	35.0		20	33.3	
Tertiary education	8	13.3		5	8.3	
Pry source of livelihood						
Farming	39	65.0		24	40.0	
civil servant	6	10.0		5	8.3	
Artisan	8	13.3		18	30.0	
Trading	7	11.7		13	21.7	
A secondary source of livelihood						
The service provider (daily paid)	11	26.2		6	16.7	
Artisan	5	12.0		7	19.4	
Trading	13	30.9		12	33.3	
Farming	13	30.9		11	30.6	
Farm size						
≤ 1 ha	32	61.5		40	66.7	
1 - 2 ha	13	25.0	0.81ha	12	21.1	0.86ha
> 2 ha	7	13.5	SD±0.861	5	8.8	SD± 0.318
Annual income (₦)						
≤ 300,000	33	55.0		38	63.3	
301,000-500,000	17	28.3	₦263,666.67	16	26.7	₦287,000.000
>500,000	10	16.7	SD± 101,713.56	6	10.0	SD±114,570.67

Field Survey, 2018

Forms of Flood

In Figure 1, the forms of flood experienced in the two states were similar and mostly fluvial (55.0% and 70.0%) with a very few proportion (28.3% and 30.0%) experiencing pluvial flood.

However, 33.3% of the respondents in Ondo State experienced coastal flood especially in the areas that lies on the coast of the sea (communities in Ilaje-Ese Odo) in Ondo State. It indicated that river flooding was prevalent in

both States. Majority of the respondents have their houses and farms close to the rivers or in

a low elevation location.

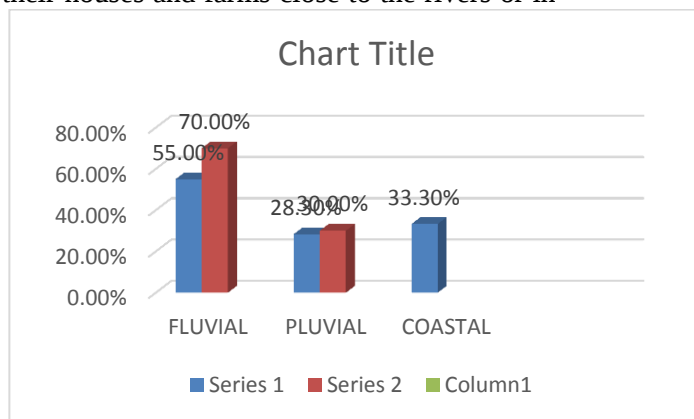


Figure 1: Types of Flood

Source: Field survey, 2018.

Frequency of the Occurrence of Flood

The result in Table 2 shows the distribution of respondents based on the frequency of occurrence of flood in the communities. In Ondo State, more than half (60.0%) of the respondents experienced flooding often while

(70.0%) of the respondents in Oyo state experienced flooding repeatedly. It demonstrates that flood occurrence in the area have been a regular or repeated occurrence which happened almost every year when there is continuous and heavy rainfall.

Table 2: Frequency of the Occurrence of Flood

Frequency of occurrence	Ondo State		Oyo State	
	Freq.	%	Freq.	%
Very often	10	16.6	7	11.7
Often	36	60.0	42	70.0
Once in a while	14	23.4	11	18.3

Source: Field survey, 2018.

Management Strategies Adapted to Prevent Future Occurrence of Flood in Ondo state

The data in Table 3 shows the management strategies employed to prevent flood varies by state. In Ondo state Eight different strategies were above the mean ($\bar{x}=3.0$). these include Channelization of rivers , relying on relief funds from government and Obeying early warning information ($\bar{x}=3.86$) respectively, control of dams by government($\bar{x}=3.75$), Listening to flood monitoring and warning information ($\bar{x}=3.56$), construction of drainages by government ($\bar{x}=3.17$), and obeying laws and order on house construction ($\bar{x}=3.17$). In Oyo state, four strategies were above the mean. They include channelization of rivers ($\bar{x}=4.0$), control of dams by government ($\bar{x}=3.5$), construction of drainages by government ($\bar{x}=3.17$), and relying on relief funds from government ($\bar{x}=3.16$).

The study affirmed that the rural households in Ondo state were more concerned about overcoming flooding than their counterparts in Oyo state. Also, the rural households in Ondo state adopted both structural and non-structural flood management strategies as indicated by Mladenović (2015), though very few of such were adopted, but they are better than their Oyo state counterparts who rely only on the government interventions to manage flood. Despite the early warning information on radio and television houses, the households in Oyo state didn't listen to or adhere to such information. It corroborate the findings of Adetunji and Oyeleye, 2018) that the most hit by flood in Oyo state are usually urban poor who have less choice, but to end up living in flood prone areas. No wonder they have less adaptation strategies to flooding. Aside that, the households in both state could not maintain hygienic environment as they didn't use

drainages properly or dispose refuse properly. They also didn't sort their refuse before disposal. No wonder, the regular occurrence of flood in the area. Without attitudinal changes to maintain hygienic environment, all the efforts of the government in channelization of rivers, constructing drainages and control of

dams will be futile. It is significant to note that none of the households from the two states embraced the use of flood insurance. It might result from the fact that flood insurance is not prominent in Nigeria apart from the fact that most of them were very poor.

Table 3: Management Strategies Adopted to Prevent Future Occurrence of Flood

	Mean point ($\bar{x}=3.0$). Ondo state	Mean point ($\bar{x}=3.0$). Oyo state
Listening to flood monitoring and warning information	3.56*	2.01
Obeying early warning information	3.86*	2.7
Proper use of drainage system	1.92	2.0
Proper disposal of refuse	1.92	1.67
Sorting of refuse before disposal	1.33	1.3
Construction of drainages by government	3.17*	3.17*
Regular evacuation of blocked drainages	2.32	2.32
Construction of bridges	2.60	2.58
Use of sand bags	3.05*	2.25
Channelization of rivers	3.86*	4.0*
Use of flood insurance	1.33	1.33
Rely on relief funds from government	3.86*	3.16*
Raising house foundations	1.52	1.52
Obeying laws and order on house construction	3.05*	2.15
Control of dams by government	3.75*	3.5*
Construction of water barriers around the house	1.43	1.43
Demolishing houses close to river banks	1.17	1.26

Source: Field survey, 2018.

Consequences of Flooding on the Livelihood of the Respondents in the Study Area

The result in Table 4 revealed the consequences of flooding on the livelihoods of the respondents. Flood significantly affect agriculture in Ondo State where 67.78, 58.89, 62.22, and 53.33percent of the respondents lost food crops, fertile soils, livestock, and experienced low crop yields respectively. The same scenario occurs in Oyo State where 57.78, 52.22, 68.89 and 48.89percent of the respondents lost food crops, fertile soils, livestock, and experienced low crop yield respectively to flooding. This might negate their food security status and increase rural poverty among the households

Furthermore, the effect of the flood on the health of the respondents shows that in Ondo

state, 80.00, 63.33, 55.56 and 55.56percent of the respondents reported that flood causes outbreak and widespread of diseases (such as cholera, malaria, and typhoid fever), physical injuries (such as ankle dislocation), disruption of health facilities and emotional instability respectively. It was similar to that of Oyo State where 78.89, 62.22, 55.56 and 74.44percent of the respondents reported that the flood causes an outbreak of diseases, physical injuries, separation of health facilities and emotional instability respectively.

Furthermore, the findings show that, in Ondo State, 75.56percent of the respondents lost their income as a result of a flood, while 68.89percent indicated that flood causes an increase in the cost of living. In Oyo State, 76.67percent of the respondents experienced the loss of income while 67.78percent

experienced a high cost of living. It implies that the respondents were going through economic hardship which could limit or affect their resilience or capacity for renewal, reorganization and development of their community. These findings agree with De Silva and Akiyuki, (2018) that household that depends on agriculture for their livelihood has low income and suffer most from the flood.

The effect of flooding on the social assets of the rural household as revealed in the table shows that more than half (57.78%) and (67.80%) of the respondents in Ondo and Oyo states respectively suffers homelessness this could bring a severe condition on the health of the respondents as it could expose them to various health challenges.

While considering the effects on the physical assets show that 91.11 and 90.00 per cent of the respondents from Ondo and Oyo States respectively lost their properties to flood. Also, flood damaged the roads and bridges in the two states.

. The study affirmed that flooding affects every aspect of the lives of rural dwellers. These findings agreed with the assertion of Asharif, Muhamed, Babar, Ghazanfar, and Muhamad (2013) that flood destroy the livelihood assets of rural communities and thereby making them vulnerable to poverty and food insecurity in flood-prone areas.

Table 4: Effects of Flood on the Livelihood of the Respondents

Effects	Ondo State		Oyo State		Pooled Data	
	Freq.	%	Freq.	%	Freq.	%
Effect on Agriculture						
Loss of food crops	61	67.78	52	57.78	113	62.78
Loss of soil fertility	53	58.89	47	52.22	100	55.56
Loss of livestock	56	62.22	62	68.89	118	65.56
Low crop yield	48	53.33	44	48.89	92	51.11
Submerged condition of farmland	24	26.67	25	27.78	25	27.78
Effect on health						
Loss of life	0	0	0	0	0	0
Outbreak of diseases	72	80.00	71	78.89	143	79.44
Physical injuries	57	63.33	56	62.22	113	62.77
Disruption of access to health facilities	50	55.56	50	55.56	100	55.56
Destruction of health facility	2	2.22	0	0	2	1.11
Emotional instability	68	75.56	67	74.44	135	75.00
Effect on the economy						
losses of income	68	75.56	69	76.67	137	76.11
Increase the cost of living	62	68.89	61	67.78	123	68.33
Effect on social assets						
Homelessness	52	57.78	61	67.78	113	62.77
Lack of access to education facilities	48	53.33	57	63.33	105	58.33
Damage to education facilities	1	1.11	1	1.11	2	1.11
Effects on physical assets						
Loss of property	82	91.11	81	90.00	163	90.55
Disruption of telecommunication	0	0	0	0	0	0
Destruction of roads and bridges	46	51.11	47	52.22	93	51.66

Source: Field survey, 2018

Hypothesis: There are no significant differences between flood management strategies adopted by the households in Ondo and Oyo States.

The result of t-test in Table 5 shows that there were significant differences between the flood management practices adopted by respondents in Ondo and Oyo States, t-value=1.890 at 0.05 level of significance. It could be as a result of

differences in intensity and level of sensitization and awareness carried out in both States; it could also be as a result of the degree of exposure of the respondents to modern practices to mitigate flood in their respective States. Thus, the null hypothesis was rejected as significant differences exist between the management practices adopted by the respondents in Ondo and Oyo States.

Table 5: T-Test Analysis of the Differences between Management Practices Adopted by the Respondents in Ondo and Oyo States

Paired Sample	T	Df	Significant	Correlation
OYO-ONDO	1.890	88	0.000	0.982

Source: Field survey, 2018.

* Significant at 0.05 level of significance

Conclusion and Recommendation

The study revealed that most of the respondents were male, young and literate. The households in Ondo state were primarily small scale farmers but their counterparts in Oyo state engaged in trading, civil service jobs and artisan's aside farming. Most of the respondents in Ondo state are living below the poverty line of less than \$1.90 a day while their counterparts from Oyo state are just a little bit above the poverty line. The findings revealed that pluvial and fluvial flooding were common in Ondo and Oyo states. There was coastal flooding in Ondo State while Oyo state has no record of coastal flooding. The households in Ondo state adopted both structural and non-structural management strategies, while the households on Oyo state relied only on the government for flood management. The strategies adopted in Ondo state were more than that of Oyo state. None of the households in the two states utilized

flood insurance. The households in Oyo state rely mostly on government interventions to manage flood. The T-test result reveals a significant difference between the management practices adopted by both states. The study revealed that flooding affected agriculture, health, economy, social and physical assets of the rural households in both States.

The study, therefore, recommends increased sensitization on flood and its consequences in both states, while there is the need for attitudinal changes by the rural households on environmental management to averse the effects of flooding. The income generating activities of the should be improved upon tremendously to boost their earnings and possibly translate them above poverty level. If the farm size of the farmers increased and their income generating activities improves, there is the likelihood of embracing flood insurance policy by the respondents.

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