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ASSESSMENT OF CHALLENGES FACED BY NON-TIMBER FOREST PRODUCTS (NTFPs) DEPENDENTS'COMMUNITIES IN A CHANGING CLIMATE: A CASE OFADAPTATION MEASURES INOHAFIA LGA, ABIA STATE, NIGERIA

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ABSTRACT

Climate change has become a major obstacle to most forest resources which had aimed to reduce poverty and enhance sustainable economy globally and Nigeria in particular. This study assessed challenges of NTFPs dependents' communities of Ohafia in a changing climate. Simple random technique was used to select 9 villages out of the 26 villages in Ohafia L.G.A. A total of 216households were interviewed using a structured questionnaire. Data obtained were analyzed with both descriptive and inferential statistics. The results showed that majority of the respondents 88%carried out their farming activities based on the pattern of rainfall; while 88% of the respondents asserted that they avoided the application of chemicals and inorganic fertilizers on their farmlands.77.8% prayed to God to revert climate change and 77.3% diversified the planting of agricultural crops. Whereas 38.9% encouraged the use of compost fertility, 26.4% reduced bush burning, 40.7% embarked on rain water harvesting, and 47.2% mulched around crops to avoid transpiration due to excessive sunshine while 42.1% planted trees around their compounds to cope with CO_2 emissions. This study will guide stakeholders to make informed decisions by policy advocacy and public awareness creation and collaborate with government and donor agencies, for sustainable adaptation practices, policy initiatives. Collaborative efforts of their government and that of some developed countries are necessary in the adaptation to climate change in their communities.

Key Word: -Adaptation, Climate change, NTFPs, Ohafia and Rural dwellers.

INTRODUCTION

People all over the world are dependent upon forest resources for meeting a large number of their basic necessities. The type of resources and utilization pattern vary by ecological zones and socio-cultural areas. Forest provides a wide range of benefits at the local, national and global levels (Agbogidi and Eshegbeyi, 2008). Unlike timber exploitation, Non-timber Forest Products (NTFPs) collection impacts very small perturbation and degradation on the ecosystem. NTFPs recuperation is very fast after extraction (Adeokun *et. al.*, 2002). Still the unpredictability of climate change, impacts greatly on them. Some of these NTFPs in the studied area are *Gnetum africanum, Pentaclethra macrophylla, Tetrapleura tetraptera, Dennettia tripetala, Archachatina marginata, Mushrooms, Bushmeats, Honeybees, Roots and herbs* etc.

Adaptation to climate change entails taking the right measures to reduce the negative effects of climate change (or exploit the positive ones) by making the appropriate adjustments and changes. IPCC (2007) defined adaptation of climate change as any human interventions aimed at reducing the sources or enhancing the sinks of greenhouse gases. These adaptation measures are not farfetched in Ohafia LGA., Abia State and Nigeria as a whole. Despite being faced with a lot of challenges, the rural dwellers in Ohafia LGA are trying to take the right measures to cope with climate change impacts so as to enhance their livelihood outcomes.

MATERIALS AND METHOD

Study Area

The study was carried out in Ohafia LGA of Abia State, Nigeria. Ohafia is one of the 17 LGA in Abia State. It comprises 26 villages. Ohafia is predominantly known for producing a lot of NTFPs like: *Gnetum africanum, Pentaclethra macrophylla, Tetrapleura tetraptera, Dennettia tripetala, Archachatina marginata, Mushrooms, Bushmeats, Honeybees, Roots and herbs*. The LGA experience series of harsh weather conditions too. Its geographical coordinates in degrees and decimal minutes are Latitude 5º 36" and 5º 48" N and Longitude 7º 48" and 7º 52" E and altitude of 124m above sea level in the moist rainforest zone. The average rainfall is 2177mm per annum with relative humidity of about 72% (Meteorological Station of NRCRI Umudike, 2004 and 2005). It is a tropical rainforest zone (NEST, 2011). The LGA experiences its rainy season from March to October and dry season from November to February.

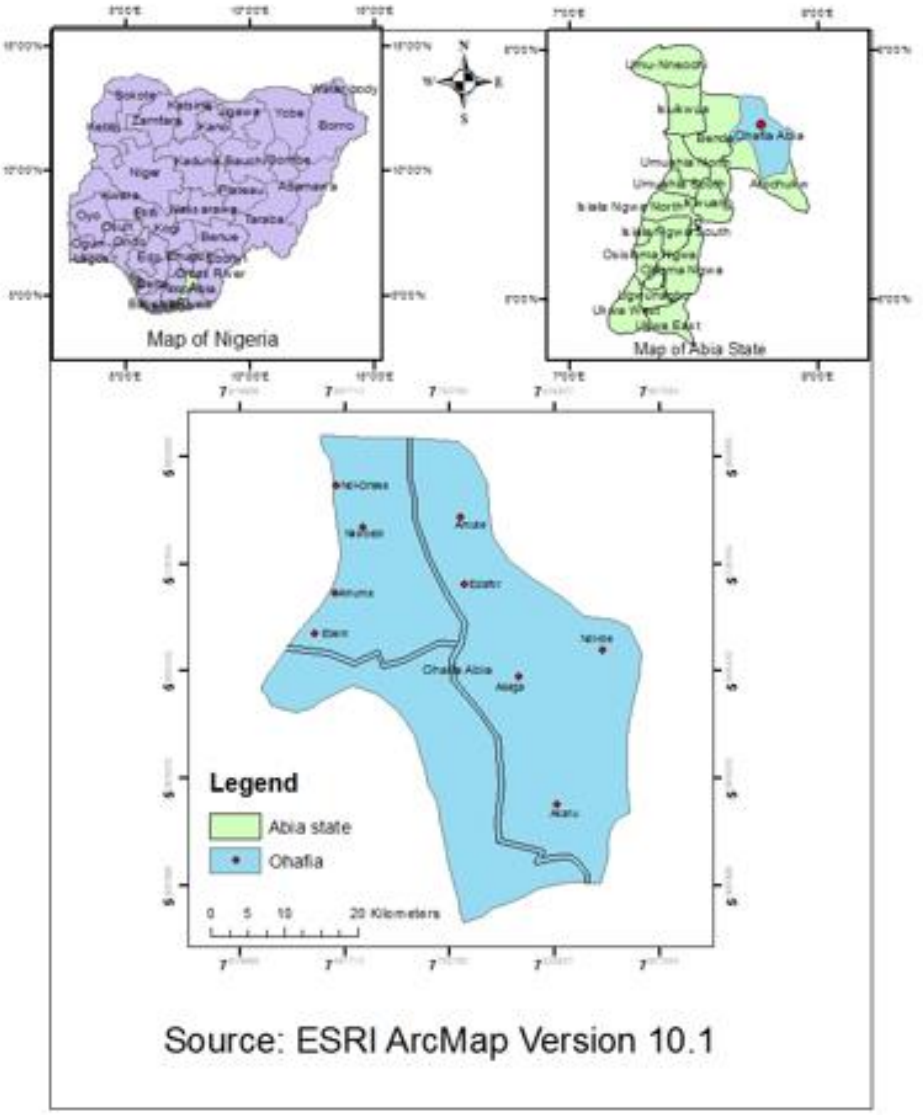

Fig. 1: Showing Ohafia LGA locationin Abia State and the study areas.

Data collection, sampling procedure and sample size

Data was collected on based onsocio-economic characteristics, perception, challenges and adaptation strategies embarked upon by the respondents. The study adopted the method of (Bernard, 2005) which is a simple random technique. This method was used to select 9 villages (Akanu, Asaga, Ndi-Ibe, Eziafor, Amuke, Ebem, Amuma, Nkwoebi and Ndi-Orieke) out of the 26 villages in Ohafia LGA so as to minimize the bias. Systematic sampling method was then used to select every 6th house in each village. This method was adopted from the study of "Qualitative Data Collection in Scientific Research", (Odebode, 1999). A total of two hundred and sixteen (216) households were selected whereby household heads were interviewed.The respondents selected were 20% of the number of households from each of the nine villages. Qualitative and quantitative primary data were collected in the study. Focus Group Discussions (FGDs) and In-depth Interviews (IDIs) with key informants (village leaders) were the participatory tools used to obtain information from the respondents. The FGDs consisted of two (female and male) groups of respondents from each of the sampled locations. The male groups comprised of 5 elderly and 5 youths while the female groups comprised of 5 elderly and 5 youths. The IDIs comprised of 3 key informants from each village, these included (Ezeogo, Queen mother and Chief Farmer).

Data Analysis

Data was analyzed using both descriptive and statistical methods including mean score and percentages.

RESULTS

Socio-economic characteristics of Respondents

The Table1 below reveals that majority (26%) of the respondents were between 25- 34 years. This showed that the household heads were still in their productive working age. The implication of this is that these household heads are still young, energetic and able bodied, and should therefore be able to pursue their livelihood activities with some ease and effectively such that they are able to adequately provide for their households needs. This agrees with the findings of Msalilwa *et. al.* (2013), Akponikpe *et al*. (2010) which affirms that age has an influence in the accumulation of knowledge as regards to climate change and variability in a particular locality. Msalilwa*et al*., (2013) and Udeagha (2014) also affirmed that age has a positive relationship with the level of perception on climate change and variability.

Majority households (66.2%) were male headed while (33.8%) were female headed household. The predominance of male headed households in the studied area and especially their involvement in the Non-timber forest products (NTFPs) activities may attest to the importance of this particular activity as a genuine income yielding venture capable of providing household's livelihood requirements. This result shows that there were more male headed households involved in Non- Timber Forest Products (NTFPs) related livelihood activity.

Of all the respondents, 56% were married, while single, widowed, and separated constitute 34.7%, 8.8%, and 0.5% respectively. This implies that married individuals dominated the study. The plethora of married people has huge implication for family labour supply (lronkwe and Olajede, 2012). Marriage predispose an individual to become responsible than ever been since they must cater for their family needs. Therefore, most of the married farmers may have so much responsibility in terms of taking care of their families and will engage themselves in farming as a way of providing food for the family as well as generate income to take care of the family. This includes engaging in NTFPs collection and marketing which is a common practice among the respondents. Non-timber forest production and trading are important household income generation sources.

Table 1: Socio-Economic characteristics of the respondents

Socio-economic characteristics	Frequency	Percentage
Age of respondents		
18-24	45	20.8
25-34	56	26.0
35-44	54	25.0
45-54	39	18.1
55-64	22	10.2
Total	216	100.0
Marital status		
Single	75	34.7
Married	121	56.0
Widowed	19	8.8
Separated	1	0.5
Total	216	100.0
Gender		
Male	143	66.2
Female	73	33.8
Total	216	100.0
Educational qualification		
None	18	8.3
Primary	32	14.8
JSS	35	16.2
SSS	95	44.0
OND/HND	28	13.0
B.Sc	7	3.2
PhD	1	0.5
Total	216	100.0

Source: Field survey data, 2017.

Occupation and income of Respondents

In the Table 2 below, it was observed during study that older women only gather NTFPs close or around fallow lands and farm lands while men and young ladies go deep into the forests to harvest NTFPs. Again, most of the men have begun to domesticate some of the NTFPs by establishing plantations of Ugbaga (Oil Beans), Uda (Guinea Pepper), Ukazi (*Gnetum spp.*), Ochiogochio (*Tetraptera spp.*), Osu/Erue (Mushrooms) etc. According to the respondents, they have higher economic value (returns) even though they are becoming less abundant in the face of the changing climate. The occupations of household heads were grouped into thirteen occupation-mixes as shown in Table 1. Harvesting of NTFPs and trading in NTFPs were the primary occupation of majority (30.1% and 19.4%) of the household heads.

Of the sampled respondents, (76.8%) harvested NTFPs in 2016, while (23.2%) did not harvest any NTFPs in last year 2016. The dominance of those that collected NTFPs last year (2016) shows the importance of NTFPs collection as a means of income diversification in the study area. This is in agreement withthe study of Udeagha (2014), who said that, "dependency of rural households onNTFPs collection and trading is a means of income diversification that grows with time. He further stated that "more people got involved in NTFPs collection and trading in Akwa Ibom State of Nigeria in the current year of his study than in the preceding year as indication that harvesting of NTFPs increased with time in his study area.

Table 2: Occupation and source of income of the respondents

Household head occupation	Frequency	Percentage
Crop/livestock	18	8.3
Harvesting of NTFPs	65	30.1
Civil servant	12	5.6
Trading in NTFPs	42	19.4
Trading in Non NTFPs	16	7.4
Health worker	7	3.2
Hair dresser	14	6.5
Fishing	3	1.4
Hunting	5	2.3
Technician/Artisan	5	2.3
Construction worker	7	3.2
Wage labourer	15	6.9
Housewife	7	3.2
Total	216	100.0
Household main source of income		
Crop production	44	20.4
Livestock production	13	6.0
Non-timber forest production/trading	60	27.8
Full-time wage/salary	42	19.4
Part-time wage/salary	31	14.4
Remittance from relatives	10	4.6
Others	16	7.4
Total	216	100.0
Household harvest of any NTFP in 2016		
Yes	166	76.8
No	50	23.2
Total	216	100.0

Source: Field survey data, 2017

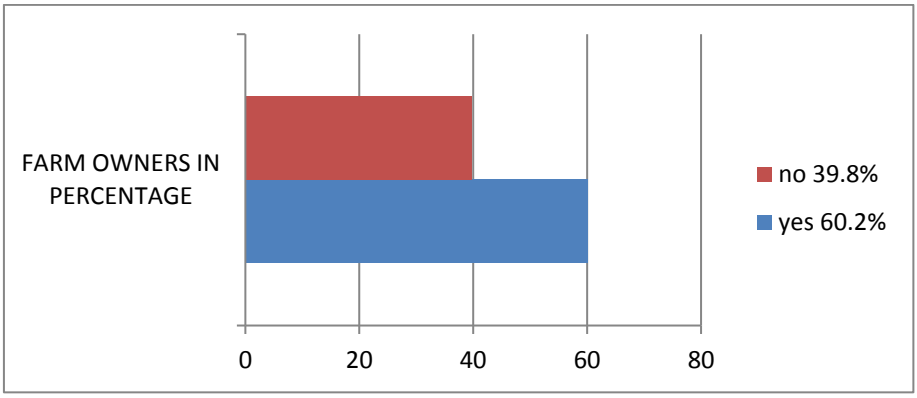

Fig.2: Showing the percentage of farm owners in the studied area

Perceptions of respondents on adaptation measures for coping with impact of climate change in the studied area

The results in Fig. 3 below shows respondents in the studied area reputed that God (56%), human beings (82.4%) government institution (88%) and rich countries (77.3%) are responsible for the adaptation of climate change in the studied area. Government institution ranked highest followed by human beings and leading roles of rich countries. This suggests that collaborative efforts of government institutions, the people in the studied area and that of rich countries are involved in the struggle against climate change in the studied area.

According to Msalilwa *et al.*, (2013), most rural dwellers believed that climate change is punishment from God and that only He can change the situation once he forgives human beings of their wrong doings. The significant role of governments through its institutions and the support of developed countries in the adaptationof climate change were discerned in the works of Eneji *et al*., (2012), Ray (2011) and Rao *et. al*., (2010).

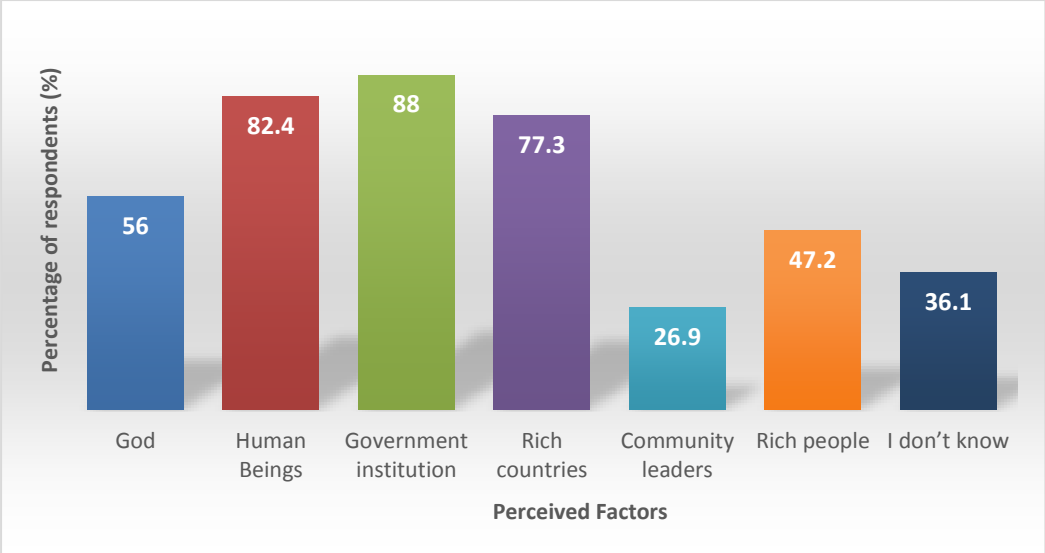

Fig.3: Perceived factors responsible for climate change adaptation

Climate change related challenges faced by the community in Ohafia LGA

Climate change related challenges faced by the respondents in the study area that required adaptation were assessed and the result is presented in Figure 4 below. The result shows that (98.6%, 92.6%, 85.2%, 62%, 56.5% and 50.9%) of the respondents reputed that they faced such challenges as deforestation, erratic rainfall, temperature variations, extinction of some NTFPs, erosion and flooding respectively. Other observed areas that required adaptation included drought (25.9%), soil degradation (50%) and land sliding (29.6%). Deforestation, erratic rainfall and temperature variations are the most challenges faced by the respondents in the study area. The implication is that policies and adaptation strategies that will checkmate these anomalies will be of great benefit to the people in the study area. The finding of this study is consistent with Udeagha (2013) who found that deforestation, variations in rainfalland temperature, erosion, flooding and soil degradation area common climatic induced challenges faced by rural communities in Nigeria.

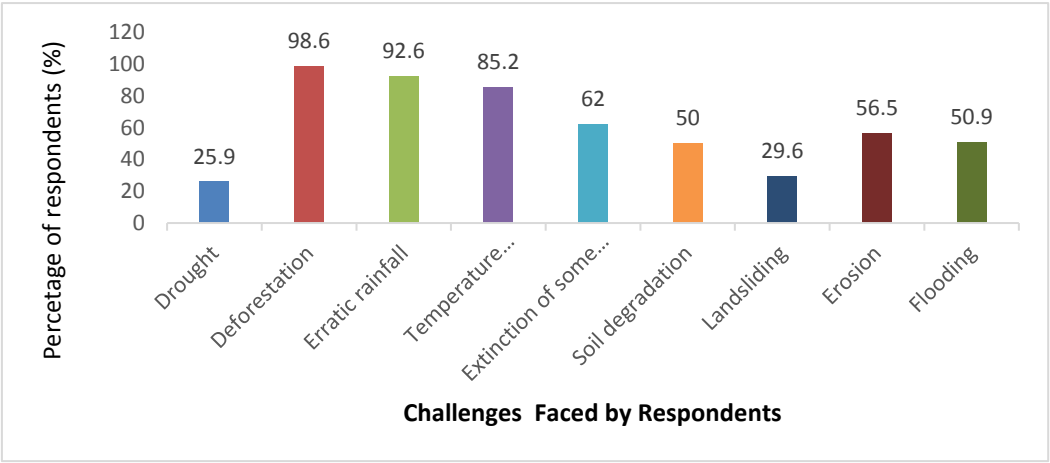

Fig.4: Percentage distribution of the challenges faced by the respondents in the study area

Levels of climatic induced challenges faced by the communities in the study area

The result in Table 3 below whereby descriptive statistics was used to analyze, showed that climatic induced challenges such as deforestation, erratic rainfall, variation in temperature, and extinction of some NTFPs, soil degradation, erosion and flooding with mean scores > 2.50 require swift adaptation attention. The overall mean score of 2.74 was higher than the decision cut-point of 2.50, implying that the respondents accepted that the aforementioned climatic induced challenges were all severe in the studied area. This result implies that there is serious need for government institutions in Nigeria and international countries and organizations that are committed to adaptationof climate change to come to their aid. There is need to educate the people of the possible solutions to variations in temperature erratic rainfall, erosion, flooding, extinction of some NTFPs etc. This finding collaborates with Kemausuor *et. al.*, (2011) whose study on farmers' perception of climate change in the Ejura-Sekyedumase district of Ghana showed that climate changes that cause flooding, variation in temperature and less rainfall are of very concern to the people in the study area. It also agrees with Udeagha (2014) who reputed that flooding, erosion, soil degradation, change in rainfall and temperature patterns, and extinction of some NTFPs were severe challenges faced by the people of Akwa Ibom state, of Nigeria.

Table 3: Severity level of the climatic induced challenges faced by the respondents

Identified climate changes induced challenges	Severe	Moderate	Slight	No effect	Mean score	STD
Drought	25	99	54	38	2.31	0.33
Deforestation	72	100	33	11	3.08*	0.69
Erratic rainfall	39	91	60	26	2.66*	0.47
Temperature variations	86	101	22	7	3.23*	0.80
Extinction of some NTFPs	42	78	64	32	2.60*	0.39
Soil degradation	89	89	20	18	3.15*	0.77
Land-sliding	64	108	41	3	2.13	0.48
Erosion	42	129	39	6	2.96*	0.77
Flooding	30	89	73	24	2.58*	0.46
Overall mean score					**2.74***	**0.57**
Number of respondents					**216**	
Decision mean cut-point					**2.50**	

Source: Field Survey Data, 2017 * signified responses above the decision mean cut-point.

Adaptation strategies embarked upon by the people in the study area

In Table 4 below 88% of the respondents engaged in farming activities based on the pattern of rainfall (either early or late) and 88% of the respondents said that they minimized the application of chemicals and inorganic fertilizers on their farmland in order to reduce the effect of climate change in the studied area. Other adaptation measures by the respondents towards reducing the effect of climate change in the study area include embarking on afforestation (52.3%), reducing pollution of the environment (50.5%), praying to God to avert climate change (77.8%), domesticating some NTFPs (50.5%), and diversifying agricultural crops (77.3%). Adaptation strategies in this study is concurrent with Boon and Akenhan (2012) who revealed that the farmers in their study area around the Sui River Forest Reserve (SRFR) in the Western Region of Ghana, also adopted some coping strategies such as cultivating drought resistant crops that have shorter gestation periods, planting of economic trees and adopting sustainable farming systems. Udeagha (2014) also noted that some farmers cope with variations in temperature and rainfall in Akwa Ibom State, Nigeria by delaying their planting time, reducing bush burning and planting of trees which is consistent with the finding of this study. Therefore, effort that is targeted at adapting to the impact of climate change in the studied area must be considered and improved upon the existing adaptation strategies adopted by the people.

Table 4: Measures adopted by respondents to reducing effects of climate change

S/No	Adaptation measures	Frequency	Percentage
1	Embarking on re-afforestation	113	52.3
2	Reducing pollution of the environment	109	50.5
3	Encouraging the use of compost fertility	84	38.9
4	Reducing bush burning	57	26.4
5	Embarking on irrigation	43	19.9
6	Embarking on rain water harvesting	88	40.7
7	Planting based on the pattern of rainfall, either early or late	190	88.0
8	Mulching around crops and other plants to avoid transpiration due to excessive sunshine and heat	102	47.2
9	Reducing the use of generator sets in the home	12	5.6
10	Using fans in homes to regulate excessive heat	174	80.6
11	Planting of trees round homes to check CO_2 emissions	91	42.1
12	Staying under the trees in the evening for fresh air to regulate body temperature	192	88.9
13	Constructing locally made aquarium in the homes to help in carbon sink	26	12.0
14	Praying to God to avert climate change	168	77.8
15	Building advent against heavy rainfall	23	10.6
16	Staying inside the house during the day	45	20.8
17	Ensuring proper disposal of waste	12	5.6
18	Attending seminars and workshops on climate change adaptation	40	18.5
19	Minimizing the application of chemicals and inorganic fertilizers	190	88.0
20	Domesticating some NTFPs	109	50.5
21	Diversifying agricultural crops	167	77.3

Source: Field Survey Data, 2017.

CONCLUSION

The study revealed that the rural dwellers mostly faced such challenges as deforestation, erratic rainfall, temperature variations, extinction of some NTFPs, erosion and flooding in their communities and this requires appropriate attention and adaptation measures. Rural dwellers in Ohafia LGA adopted a number of adaptation measures to cushion the impact of climate variability and change in their communities. Considering the already dramatic situation faced by many developing countries even "small" worsening can lead to serious threats to their socio-economic development. This also raises the crucial issue of proper re-distributional policies from developed to developing countries especially to Ohafia LGA of Abia State, Nigeria.

Recommendations

Rural dwellers should be assisted with donations, training on climate change and ways of adapting to climate change. Government and foreign countries collaborating in the quest to adapt to climate change and development of technologies should aid in adaptation strategies.

Government should embark on massive implementation of adaptation policies because most rural dwellers will be willing to collaborate towards achieving a safe ecosystem that is supportive to the livelihood of the people.

Acknowledgement

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REFERENCES

Adeokun O.A, Agbekemoge A and Adedoyin S.F. (2002). Assessment of exploitation of Non-timber forest products in Omo Forest Reserve, Ogun State Nigeria. In: Abu JE, Oni PL and Popoola L (eds). *Proceedings of FAN* held in Akure, Ondo state, Nigeria, between 4th and 8th of November 2002; 2002; Pp1-10.

Agbogidi O.M and Eshegbeyi O.F. (2008). Forestry development for a safe Environment. In: Onyekwelu JC., Adekunle VAJ and Oke DO (eds) In: *Proceedings of the 2nd Biennial National Conference of the forests and forest products society of Nigeria* (FFPN) held in the Federal University of Technology Akure, Ondo. 2008; Pp 372-377.

Akponikpe P. B. I, Johnston P and Agbossou E. K. (2010). Farmers' Perception of Climate Change and Adaptation Strategies in West-Africa. 2nd International Conference on Climate, Sustainability and Development in Semi-arid Regions, August 16-20, 2010, Brazil. pp.1-15.

Bernard, H. R. 2005. Research Methods in Anthropology: Qualitative and Quantitative Approaches. Lanham: Altamira Press.

Boon E and Ahenkan A. (2012). Assessing Climate Change Impacts on Ecosystem Services and Livelihoods in Ghana: Case Study of Communities around Sui Forest Reserve. *Journal of Ecosystem and Ecography.* 2012; pp.1-8.

Eneji C.V.O, Ntamu G.U, Ben C.B, Bassey T.E and Williams J.J. (2012). "Ethical Basis of African traditional religion and socio-cultural practice in Cross River State Nigeria. Journal of research in peace, gender and development. 2012; 2(2):034-042.

Intergovernmental Panel on Climate Change (IPCC). (2007). Fourth Assessment Report. IPCC Secretariat, Geneva, Switzerland. 2007.

Ironkwe A.G. and Olojede J.C. (2012). Socio-economic factors influencing the output of cassava farmers in Abia State Nigeria proceedings of the 26th Annual conf. FAMAN, Michael Okpara University of Agriculture Umudike October, 15th-19th, 2012:55-58.

Kemausuor F, Dwamena E, Bart-Plange A and Kyei-Baffour N. (2011). Farmers' perception of climate change in the Ejura-Sekydumase District of Ghana. *ARPN Journal of Agricultural and Biological Sciences*. Vol. 6, No. 10. October 2011. ISSN 1990-6145. 26-37.

Msalilwa U, Augustino S and Gillah P.R. (2013). Community perception on climate change and useage patterns of Non-Timber Forest Products by communities around KiloloDistricts,Tanzania.*Ethiopian Journal of Environmental Studies and Management.* 2013; 6 (5): 507-516.

N.R.C.R.I. (2004 and 2005). National Root Crop Research Institute Umudike Meteorological and Soil Divisions, Unpublished reports of the Abia State. 2004 and 2005.

Nigerian Environmental Study Action Team (NEST). (2011). National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CNN). Building Nigeria Responses to Climate Change (BNRCC) project. Available at 2011; Pp.1-78.

Odebode, S. O. 1999. Preparing a research report. In Oladele, I. O Akinbeli, L. A and Adekoya, A. E (eds.) Social Science Research Approaches Techniques and Reporting, Ijebu-Ode Shanu Books Ltd. Pp 77-87.

Rao B. R, Suresh B.M. V, Shridhar R.M, Reddy A.M, Rao S. V and Sunitha S. (2011). Sacred groves in Southern eastern Ghats, India: Are they better managed than forest reserves. Trop. Ecol. 2011; 52(1):79-90.

Ray R. (2011). Developing strategies for conservation of threatened endemic biodiversity of the sacred groves of Central Western Ghats project report (2011). Centre for Ecological Sciences: Indian Institute of sciences; Bangalore 560012: 2011; p.36.

Udeagha A.U. (2014). Impacts of climate change on the contributions of selected Non-Timber Forest Products (NTFPS) to rural household economy in Cross River State, Nigeria. M.Scdissertation submitted to the Department of Forestry and Wildlife, University of Uyo, Uyo, Akwa Ibom State, Nigeria. 2014.

UdeaghaA. U., UdofiaS. I.and Jacob D.E. (2013). Cultural and socio-economic perspectives of the conservation of AsantingIbiono Sacred Forests in Akwa Ibom State, Nigeria. *International Journal of Biodiversity and Conservation*. 2013; 5(11), pp. 696-703.