

Effects of Climate Change on Human and Social Livelihood Assets of Rural Farm Families in Orlu Agricultural Zone of Imo State, Nigeria

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1. Abstract

The study investigated the effect of climate change on human and social livelihood assets of rural farm families in orlu agricultural zone of Imo State, Nigeria. The specific objectives were to ascertain rural farmers' awareness of climate change, and identify sources of information on climate change and to describe the effect of climate change on the human and social livelihood assets of the rural farmers. A purposive sampling technique was adopted in selecting a sample size of 120 farm families. Data were collected with structured questionnaire and mean, percentage was used to analyze the data. The result showed that the major evidence of climate change include increased temperature, unpredictable rainfall pattern, drought, flooding, increased precipitation, crop damage and among others. Climate change affects the livelihood of rural people and can be seen in the effects it has on their human and social capita assets in the following ways - loss of human lives, food shortage, hunger and malnutrition, increased disease incidence, reduction in household. Other effects includes prevention of assistance from members of social groups to farmers and rural people at large, interruption of familiar social linkages of the poor, widows, disruption of linkages to formal and informal community organization.

2. Introduction

Environmental and climatic change is characterized by temperature changeability because of discharges of gases by human exercises. As indicated by [10], human exercises like consuming of petroleum products, modern creation, chopping down of rainfor-

ests change the environment's creation by expanding the measure of ozone harming substances, which thusly, traps heat in the environment and along these lines working with climatic changes. The effect of environmental change is two-overlap, bio-physical and financial. Whereby bio-actual effect incorporate rising ocean, lakes and waterway water levels, exceptional tempests, annihilation of species, demolishing dry spell, crop disappointment. Just as changes in overcast cover and precipitation, dissolving of polar ice covers and ice sheets, and diminished snow cover [12].

As of now environmental change is undermining numerous lives and is required to fundamentally affect the livelihoods of the provincial poor in non-industrial nations including such as Nigeria. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change [3-6] predicts that environmental change is probably going to significantly affect agrarian creation in numerous African nations; this additionally is seen in the study area and the accounts by the people. The impacts of environmental change and environment fluctuation will keep on testing weak individuals particularly in non-industrial nations. Dry spells and dry seasons will be more successive, downpour more conflicting, and heavy deluges heavier, every one of these wonders increment the danger of soil disintegration and vegetation harm through spillover. Higher temperatures will likewise expand the dissipation of soil dampness. Environmental change will bother water pressure, which the mainland has effectively experienced; more individuals will be in danger of water pressure [2].

Africa is among the continent generally helpless against environmental change and environment fluctuation. Nigeria and numerous

African nations are reliant upon areas that are defenseless against environment conditions, where agriculture, agribusiness, fisheries, ranger service, and the travel and or tourism industry are practiced. Horticulture and regular assets give the business to about 80% of the populace, and record for around 30% of GDP and 40% of fare income in Sub-Saharan Africa [15]. In sub-Saharan Africa, agriculture and related activities utilize 60% to 90% of the absolute workforces [14]. In Nigeria, agriculture/agribusiness is the prevailing sector representing around 76 % of utilized people [9].

In tending to the difficulties of a worldwide temperature alteration and environmental change, the concentration for some time has been on decreasing green house discharges [7]. There has been little advancement on diminishing these emanations and the environment has kept on changing influencing the farming area contrarily in many agricultural nations (in the same place). Presently the center is gradually moving to transformation measures to lessen weakness to environmental change impacts. This is because in Nigeria, the form of agriculture practiced is mainly subsistence farming consisting of small scale farming communities with very minimal irrigation, mechanization and application of modern technologies. Like any other developing African countries, climate change in Nigeria is predicted to impact negatively on these farmers who in most cases have few or no safety nets, little coping strategies and resources to cope with the changes.

The foregoing argument shows that climate change can no longer be sidelined as a development issue. The effect that climate change has on the poor communities in sub-Saharan Africa is increasingly prominent. According to [7] the African continent risks becoming a major global food crisis epicenter if climate change issues remain unaddressed at local levels. The vulnerability of African communities to climate change is exacerbated by high poverty levels and already high temperatures and low precipitation.

The reality of climate change is now a well-accepted reality and there is emerging evidence that climate change poses a massive threat for development especially in poor countries [8]. An understanding of the emerging trends of climate change and its effects in local ecologies is an important starting point in addressing the negative effects of climate change. As [8] points out that climate change risks is altering the physical and human geography with serious consequences for human beings. This study sought to understand the impact of climate change on the human and social livelihood assets of local communities, focusing on the rural area of Nigeria.

The main objective of this study is to assess the effect of climate change on the human and social livelihood assets of the rural farmers.

The specific objectives are to

1. ascertain rural farm families' awareness of climate change;

2. identify sources of information on climate change by rural farm families
3. describe the effect of climate change on human capital livelihood assets of rural farmers;
4. examine the effect of climate change on social capital livelihood assets of rural farmers

3. Methodology

The study was conducted in Orlu Agricultural zone of Imo state. Imo state is in South east of Nigeria. Imo state lies within latitude 4°45'N and 7°15'N and longitude 6°50'E and 7°25'E with an area of around 5100 sqkm. The estimated population of Imo state in 2021 is 5.8 million projected from the 2006 census [14]. The state is made up of three agricultural zones, namely, Orlu, Owerri and Okigwe Agricultural zones. Orlu Agricultural zone is made up of eleven local government areas, namely: Orlu, Ideato North, Ideato South, Isu, Njaba, Nkwere, Nwangele, Oguta, Ohaji/Egbema, Orsu, Oru East and Oru West. The state has tropical climate characterized by two distinct seasons, rainy and dry (harmattan) seasons. The rainy season commences in April and lasts until October with an annual rainfall varying from 1500mm to 2200mm (60 to 80). An average annual temperature above 20°C creates an annual relative humidity of 75%, with humidity reaching 90% in the rainy season (IMSG,2010). The dry season is usually from November to March, with the hottest months between January and March. The population consisted of 1,200 rural farm farmers in the study area. A total sample size of 120 rural farm families was purposively selected randomly for the study. Questionnaire was used to collect data from the rural farm families. Percentage was used to achieve the objective 2 of the study. A four (4) point Liker type scale of Strongly Agreed, Agreed, Disagreed and Strongly Disagreed, assigned values of 4 to 1 respectively was used to achieve objectives 1,3 and 4 which is mathematically represented as

$$\frac{4 + 3 + 2 + 1}{4} = \frac{10}{4} = 2.50$$

Therefore, a mean of 2.50 was adjudged okay and acceptable while any value below 2.50 was not accepted.

4. Results and Discussion

4.1. Awareness of Climate Change by Respondents: (Table 1) showed that the respondents are aware of climate change by agreeing to the following statements that; weather pattern becomes unpredictable from year to year ($\bar{X}=3.89$); the environmental temperature has increased ($\bar{X}=3.87$); the rainfall pattern has become very unpredictable ($\bar{X}=3.76$); there is increased heat on human body ($\bar{X}=3.76$); there is increased drought ($\bar{X}=3.76$); reduction in crop yield ($\bar{X}=3.74$); Increased flooding ($\bar{X}=3.71$); increased precipitation ($\bar{X}=3.68$); crop damage ($\bar{X}=3.65$); seed germination delay ($\bar{X}=3.65$). The above is true as the mean of the responses did not deviate from the standard deviation of between zero to one

(0 – 1). This is in line with the findings of Okoro, [11] who opined that some of the changes in climate conditions that they have observed in recent years include low rainfall, excess rainfall, late onset of rainfall, early cessation of rainfall, flooding and extreme high temperature. When the farmers were asked how low rainfall has affected them, their response ranges from reduced crop yield to reduce water for livestock.

Table 1: Awareness Parameters about Climate Change

Climate change awareness statements	Mean(\bar{X})	Standard Deviation
Weather pattern becomes unpredictable from year to year	3.89	0.31
The environmental temperature has increased	3.87	0.33
The rainfall pattern has become very unpredictable.	3.76	0.56
There is increased heat on human body	3.76	0.56
There is increased drought	3.76	0.56
Reduction in crop yield	3.74	0.57
Increased flooding	3.71	0.51
Increased precipitation	3.68	0.59
Crop damage	3.65	0.60
Seed germination delay	3.63	0.48

Accepted mean 2.5

4.2. Source of information on climate change

(Table 2) above showed that a greater percentage (53.3%) of the respondents got to know about climate change from the internet, 39.17% got to know from extension agents, 33.3% got the information from the radio, 26.7% got the information from the newspapers, 13.3% have their source from the Television 12.5% got to know their various cooperative societies, 7.5% got the information from other sources which include family, friends and the market place, while only 2.5% got to know about climate change from the church. This is in line with the findings of [11] who opined that the major sources of information through which the rural farmers received information on climate change include: personal observation, friends, radio, television and extension

Table 2: Sources of Information on Climate Change

Source of information	*Frequency	Percentage
TV	16	13.3
Radio	40	33.3
Internet	64	53.3
Newspapers	32	26.7
Cooperatives	15	12.5
Churches	3	2.5
Extension agent	47	39.17
Others	9	7.5

*Multiple Response

4.3. Effect of Climate Change on Human Capital Livelihood Assets

(Table 3) showed that the respondents agree that the effects of climate change on their human capital include; loss of human lives (\bar{X} =3.78); food shortage, hunger and malnutrition (\bar{X} =3.73); increased disease incidence (\bar{X} =3.71); reduction in household size (\bar{X} =3.70); limitation in the skills performed by the farmer (\bar{X} =3.69); reduction in farming experience (\bar{X} =3.68); temporary migration for wage work (\bar{X} =3.62); change in household dependency ratio (\bar{X} =3.60); loss of labour (\bar{X} =3.56); and decline in household income (\bar{X} =3.53).

Table 3: Effect of Climate Change on Human Capital

Human capital effects	Mean(\bar{X})	Standard Deviation
Loss of human lives	3.78	0.41
Food shortage, hunger and malnutrition	3.73	0.45
Increased disease incidence	3.71	0.45
Reduction in farming experience	3.68	0.47
Limitation in the skills performed by the farmer	3.69	0.46
Reduction in household size	3.70	0.46
Temporary migration for wage work	3.62	0.48
Change in household dependency ratio	3.60	0.49
Loss of human labour	3.56	0.49
Decline in household income	3.53	0.50

Accepted mean 2.5

This agrees with [6] that food accessibility and nature of accessible food decide the healthful status on human populace: as long as wholesome adequacy isn't gotten well when the body and psyche is subverted. Harm to human resources because of climate occasions and environment, like food instability, undernourishment and ongoing appetite, because of bombed harvests or hike in food costs is felt generally on poor metropolitan populace [6].

Loss of life and livestock as a result of floods was indicated by [1] as a critical menace of climate change on their livelihoods. According to [8], people have always moved from place to place in search of greater opportunity; however climate change is likely to trigger larger and more complex waves of human migration due to altered source of livelihood. Disruption of ecosystem-dependent-livelihoods will always remain a leading driver of long-term migration. The above is true as the mean did not deviate from the standard deviation of between zero to one (0 – 1)

4.4. Effect of Climate Change on Social Capital Livelihood Assets

(Table 4) showed that the respondents agree that the effects of climate change on their social capital include; prevention of assistance from members of social groups to farmers and rural people at large (\bar{X} =3.37); interruption of familiar social linkages of the poor, widows, etc (\bar{X} =3.34); disruption of linkages to formal and infor-

mal community organization ($\bar{X}=3.34$); disruption of linkages to community labour sharing for agricultural production, housework and/or child care ($\bar{X}=3.34$); high dues by members of the social groups ($\bar{X}=3.33$); unwillingness to participate in carrying out community projects ($\bar{X}=3.29$); and inadequate participation of farmers in corporate activities ($\bar{X}=3.27$). These findings can be supported with a study by [1] which reported that climate change reduces social assets through interruption of familiar social linkages of the poor, women, elderly and women-headed households and this he classified as negative effects of climate change on household live-

lihoods. The above is true as the mean did not deviate from the standard deviation of between zero to one (0.41 – 1).

The above implies that natural events like cold waves, prolonged rain or heat waves can isolate people from social functions. And similarly climate change events have negative effect on products and services, which could induce food deficit, price rise, shortages, discriminative distribution etc. and threaten the social harmony among people. Climate change has the capacity to increase forced migration of marginal groups in hills and mountain areas of the world depending on environment and thus the groups exposed to new socio-cultural areas

Table 4: Effects of climate change on social capital

Social capital effects	Mean	Standard Deviation
Unwillingness to participate in carrying out community projects.	3.29	0.94
Inadequate participation of farmers in corporate activities	3.27	0.96
High dues by members of the social groups	3.33	0.93
Interruption of familiar social linkages of the poor, widows, etc	3.34	0.88
Prevention of assistance from members of social groups to farmers and rural people at large.	3.37	0.74
Disruption of linkages to formal and informal community organization	3.34	0.79
Disruption of linkages to community labour sharing for agricultural production, housework and/or child care	3.34	0.70

Accepted mean 2.5

5. Conclusion

The study revealed that the major evidence of climate change include increased temperature, unpredictable rainfall pattern, drought, flooding, increased precipitation, crop damage and others. The major livelihood activities of the respondents in the study area include crop farming, poultry farming, fishing and fish farming, trading and livestock rearing. Climate change affects the livelihood of rural people and can be seen in the effects it has on their human, social capital assets. Such effects include loss of human lives, food shortage, hunger and malnutrition, increased disease incidence, reduction in household size, limitation in the skills performed by the farmer, interruption of familiar social linkages of the poor, widows, disruption of linkages to formal and informal community organization, disruption of linkages to community labour sharing for agricultural production, housework and/or child.

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