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**THE ROLE OF FARMERS SOCIAL NETWORKS AND RURAL RADIO IN CLIMATE CHANGE ADAPTATION IN OWERRI WEST AREA OF IMO STATE, NIGERIA.**

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**ABSTRACT:** *The study was aimed at analyzing and ascertaining the role of farmers social networks and rural radio in climate change adaptation in Owerri West Area of Imo-State. The specific objectives were to (a) describe the socio-economic characteristics of the respondent farmers in the study area, (b) ascertain farmers awareness of climate change, (c) describe the effects of climate change on agricultural activities of the respondents, (d) identify the various social networks in the study area and (e) identify roles of various social networks and radio in farmers adaptation to climate change. A simple random sampling method was used to select one hundred and twenty (120) farmers for the study. Frequency distribution percentages and mean were used in the analysis of data collected. Results of the study showed that majority of the respondents (76.7%) were males with a mean age of 53years. Results indicate that all the respondents were very much aware of climate change. Farmers also ascertain high rainfall, flooding, decrease in crop yield, erosion, storage losses and hot temperature (hot heat) as their observation due to effects of climate change. Social networks include cooperatives, age grades, town unions and religious groups etc. Some recommendations include: (a) Education of farmers about climate change and their modern adaptation measures which could be achieved by organizing seminars, conferences and programmes on climate change regular for them. (b) Government should link and collaborate with the farmers organization (social networks), research institutions and meteorological centres that will help in order to access information, design appropriate and affordable adaptation measures to climate change.*

**KEYWORDS: Climate Change, Social Networks, Adaptation, Farmers, Radio, Rural**

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## **INTRODUCTION**

Climate change (including climate variability) already affects physical processes in many parts of the world, leading to changes in temperature and rainfall patterns, in wind direction and increased intensity and frequency of extreme events like droughts, floods and cyclones (Ifejika 2010). The time lagged nature of climate change implies that the currently observed climate change is attributed to greenhouse gas omissions of the 19<sup>th</sup> and 20<sup>th</sup> centuries and that the effects of current greenhouse gas emissions will also lag into the future (Ifejika 2010). This means that focusing on mitigation alone will not address the inevitable impacts of currently observed climate change. Adaptation, that is adjustments which moderate harm or exploit beneficial opportunities in response to actual or expected-climate stimuli or their effects is therefore imperative (IPCC 2007b).

Because many biological and socio-economic processes such as crop growth and produce prices depend in part on production conditions (of which climate is one), changes in climate affect food

and livelihood security. It also reverses development achievements for example; crop failure due to frequent droughts contributes to increased poverty. However, climate change also holds some opportunities, for example, areas that were hitherto not conducive to agriculture, like higher altitudes, become so due to increases in temperature. However, in global comparison, Africa is expected to experience mainly negative climate change impacts, in terms of an increase in the already high temperature and a decrease in the largely erratic rainfall in its context of widespread poverty and low development (IPCC 2007a).

Therefore, planning and financing adaptation as well as adapting to climate change require an understanding of current conditions in social, (economic, political and cultural) and ecological as well as sector-related dimensions (Adger, 2005;2006). It requires an understanding of the adaptive capacities, resilience and livelihood strategies of the local population who are directly affected by the impacts of climate change and who must cope with the realities of multiple pressures (e.g. Climate variability and change, market and institutional failures, environmental degradation, poverty and diseases to mention just a few). It also requires an understanding of how the various levels of governance enable or hinder local actors to improve their wellbeing. Knowing all about climate change and the options for adaptation will allow for well-informed decision-making by farmers, policy makers and practitioners. Indeed, understanding the relationship between climate change, the human responses it necessitates, and how institutions shape such responses is an increasingly urgent need. This report directs attention towards a subset of such relationships, focusing on rural institutions and poor populations in the context of climate variability and change-induced adaptations (Adger, 2000.)

It is critically important to understand better the role of institutions in shaping adaptation, especially the role of local institutions, if adaptation to climate change is to help the most vulnerable social groups. Adaptation to climate change is highly local, and its effectiveness depends on local and extra-local institutions through which incentives for individual and collective action are structured (Easterling and Apps 2005; Tompkins and Adger 2004). Not only have existing institutions affected how rural residents responded to environmental challenges in the past, they are also the fundamental mediating mechanisms that will translate the impact of external interventions to facilitate adaptation to climate change. Institutional arrangements structure risks and sensitivity to climate hazards, facilitate or impede individual and collective responses, and shape the outcomes of such responses. Understanding how they function in relation to climate and its impacts is therefore a core component in designing interventions that can positively influence the adaptive capacity and adaptation practices of poor populations (Easterling and Apps 2005; Tompkins and Adger 2004).

Poverty is one of the major factors accountable for the vulnerability and limited adaptive capacity of sub-Saharan Africa (World Bank 2007; Ifejika, 2008). It is also the poor who first bear the brunt of climate change impacts and at the same time have little or no capacity to withstand or adapt to climate change. Thus, climate change will worsen the situation for the poor. This constellation has implications for development cooperation-meaning that in the context of climate change, development cooperation must orient itself inter alia towards adaptation to climate change (hereafter referred to as adaptation). For adaptation, this means that adaptation must be development-oriented to achieve the Millennium Development Goals (MDG), in particular, to

halve the proportion of the world's population whose income is below 1 US \$ a day by 2015 (UNDP 2003). A large proportion (> 40%) of the poor (living with < 1 US \$ a day) in sub-Saharan Africa (SSA) live in rural areas (World Bank 2007) and depend mainly on agriculture despite the increasing growth of off-farm incomes and rural urban migration.

The fact that many small holders are poor, practice rain fed agriculture, and account for most food production in SSA implies that; (a) any policy which aims at poverty and hunger reduction needs a major focus on the rural population, (b) since most of the rural population depend on rain-fed agriculture, increasing agricultural growth, although not solely sufficient in most cases crucial for poverty reduction (World Bank 2007); (c) although rainfall is an important factor, the contribution of other aforementioned multiple pressures and factors framing the adaptive capacity of small holders also needs to be considered, and finally (d) since rain-fed agriculture is directly dependent on rainfall, and climate change will manifest itself in changed temperature and rainfall patterns, it is prudent to examine how adaptation in SSA agriculture and in particular among small holder farmers can be promoted in a more resilient manner. (Ifejika, 2008).

Historical experience and knowledge about adaptation possibilities is critical to future policy formulations regarding adaptation. This is because the specific nature of climate change impacts continues to be uncertain, especially for small territorial units, even as it is evident that the general impacts of climate change will be striking and long lasting if current trends continue. Future efforts to address climate change and craft strategic initiatives to enhance rural poor's adaptive capacity can therefore profitably examine historical adaptive responses, their institutional context and correlates, and the role of institutions in facilitating adaptation. Indeed, documenting, understanding, and learning from past institutional experience and crafting interventions that strengthen historically proven collective efforts and institutions is a critical first step. It is also potentially one of the most effective mechanisms in the multi-stranded effort to address the adverse drastic as well as long-term impacts of climate change. In this work therefore, farmers social networks refer to the institutions and organizations in the study area that influence and mold farmers activities in the study area towards climate change adaptation. (Agrawal *et. al.*, 2008). The broad objective of the study was to ascertain the roles of farmers social networks and rural radio in climate change adaptation among farmers in Imo State, Nigeria. The specific objectives are to ;

- (a) describe the socio-economic characteristics of the respondents.
- (b) ascertain farmers awareness of climate change
- (c) describe the effects of climate change on agricultural activities of the responde.
- (d) identify the various social networks in the study area.
- (e) identify roles of the various social networks and radio in farmers adaptation to climate change.

## METHODOLOGY

The study was carried out in Owerri West Area of Imo State, Nigeria. Imo State is located or situated on latitude 4°14N and 6°151°N and longitude 6°51 east and 8°09<sup>1</sup> east of the equator. The area is bounded by Ikeduru and Aboh Mbaise to the East, Mbaitoli and Oguta to the North, Ohaji to the West and Ngor Okpala to the South. Owerri West is made up to 18 communities namely

Avu, Amakohia-Ubi, Emeabiam, Eziobodo, Ihiagwa, Irete, Nekede, Obinze, Oforola, Umudibia, Umuoma, Umuokpo, Ohii, Okolochi, Okuku, Umuguma, Ndegwu, Orogwe. It has its head quarter at Umuguma. The local government is basically situated in the rainforest zone of Imo – State of 972km<sup>2</sup> approximately and has estimated population of about 145, 737 people (projected from 2006 National census frame). This locality has two (2) main season namely dry season and rain season. Its rainfall pattern is bimodal ranging between March and October, though with climate variations in weather, it changes depending on the climatological situations in that year, with a temporal cessation in November. It has an average rainfall which ranges from 300 – 350m. The sample random sampling technique was used for the study. The sample frame was the list of all farmers in Owerri West collected from the village heads of the communities. Out of the 18 communities listed above, 12 were be randomly selected for the study area of which 10 farmers each were used making a total sample size of 120 farmers selected in the local government area for the study. Data was collected using a structured questionnaire distributed to farmers by the researcher. This methods of data collection (structure questionnaire) was used to collect data from literate farmers while the interview schedule (face to face contact was used to obtained data from farmers who cannot read or write. Basically, descriptive statistics was used to analyze most of the data. These involved the use of percentages and frequency counts, means presented in tabular forms. This was used to achieve objectives 1,2,3,4 and 5.

## RESULTS AND DISCUSSION

### Socio – Economic Characteristics of the Respondents

ATTRIBUTE	FREQUENCY	PERCENTAGE
<b>Sex</b>		
Male	92	76.7
Female	28	23.3
<b>Age</b>		
21-30	9	7.5
31-40	19	15.8
41-50	25	20.8
51-60	27	22.5
61 and above	40	33.3
<b>Marital Status</b>		
Single	11	9.2
Married	104	86.7
Divorced	1	0.8
<b>Household size</b>		
1-5	57	47.5
6-10	53	44.2
11 and above	10	8.3
<b>Educational Level</b>		
No formal Education	5	4.2
Adult Education	10	8.3
Primary	13	10.8
Secondary	51	42.5
Tertiary	41	34.2
<b>Farm size</b>		
<b>0.5-1</b>	<b>43</b>	<b>35.8</b>
<b>1.5-2</b>	<b>57</b>	<b>47.5</b>
<b>2.5-3</b>	<b>18</b>	<b>15</b>
<b>3.5 &amp; above</b>	<b>2</b>	<b>1.7</b>
<b>Farming Experience</b>		

<b>1-5 years</b>	<b>9</b>	<b>7.5</b>
<b>6-10 years</b>	<b>31</b>	<b>25.8</b>
11-15 years	29	24.8
16-20 years	17	14.2
21-2 and above	34	28.3

The table above (table 1) shows that 76.7% of the farmers are males, while 23.3% are female. This shows that the male being heads of families have major stake in farm decisions. It can be seen from the table that out of the 120 farmers selected for the study, 7.5% are of the age bracket of 21-30 years, 15.8% at the age bracket of 31-40 years, 30.8% are of the age bracket of 41-50 years, 22.5% are at the age of 51-60 years, while 33.3% are above 61 years. Therefore, the mean age of the farmers in the study area is 53 years. This shows that the farmers are relatively old enough to understand and know the topic of the research. The table reveals also that 92% of the farmers are singled (unmarried), 86.7% farmers are married men and women, one divorced with 0.8%, widowed are 3.3% while non are separated.

Again, 47.5% of the farmers have a household size of 1-5 members, 44.2% farmers has 6-10 members, while 8.3% farmers has a household size of 11 and above. It can be seen from the table that 42.5% of the respondents attended secondary school, 34.2% attended tertiary institution 10.8% completed their primary school, 8.3% had adult educational programme while 4.2% had no formal education at all. This therefore implies or reveals that the farmers in the study area are literate and knowledgeable enough to understand the study and more about agriculture or farming. The table shows that most of the respondents engage in farming activities as their major occupation of living with 67.5% farmers, 12.5% of them are traders, 8.3% are artisan, while 11.6% are civil servants. The result from table 1 reveals that out of the 120 farmers, 73.3% of them belong to one social organization or groups while 26.7% farmers did not belong to any organization. This shows that social organization or networks serves as a medium where these farmers in the study area meet, interact, share and exchange ideas with other farmers.

Again, table shows that 45% of the farmers were not visited by an extension agent at all, 5% of them were visited every forth nightly, while 50% farmers were visited once in a while by an extension agent. This explains why they are aware of climate change issues. It can be seen from the table that most of the farmers engage more in crop production than animal or both. This reveals that about 84.2% of them are crop farmers, 10.8% of the farmers engage in animal production while both crops and animal farmers are only 5%. From the table above, about 35.8% of the farmers have a farm size of 0.5 to 1 hectare of land, 47.5% of them have 1.5 to 2 hectare, 15% has 2.5 to 3 hectares, while 1.7% have 3.5 to 4 hectares. The table shows that 28.3% of the respondents have over 21 years experience in farming. Then, 25.8% of them have experience of 6 to 10 years only, while 24.8% respondents have 11 to 15 years experience in farming, 14.2% have 16-20 years of experience while 7.5% respondents have 1- 5 years experience in farming.

**Awareness of Climate Change****Table 2. Sources of Awareness**

Source of awareness	Frequency	Percentage (%)
Through the media	33	27.5
Social organization	7	5.8
Experience and observation	77	64.2
Extension services	1	0.8
From friends	2	1.7

Table 2 above reveals or shows that most of the respondents (64.2%) were aware of climate change through experience and observations. Others became aware through the media with (27.5%), social organization with (5.8%), through extension service with (0.8%), and finally through friends with (1.7%). This implies that the respondents are fully aware of climate change occurrence and manifestations.

**Observed Effects of Climate Change****Table 3. Observed effects of climate change.**

Effects of climate change	Respondents	Percentage (%)
Flooding	48	40
High rainfall	81	67.5
Much Health (hot temperature)	18	15
Decrease in yield crop	36	30
Storage losses	25	20.8
Drought	40	3.3
Erosion	33	27.5
Decrease in soil moisture	7	5.8
Incidence of pest and diseases	19	15.8
Multiple responses .		

Table 3 shows that the effects of climate change are plenty and numerous. From the multiple response of the farmers, high rain fall with (67.5%) is the major effect of climate change. Other effects observed are flooding with (40%), decrease in crop yield (30%), hot temperature (heat) with (15%), decrease in soil moisture (5.8%), and drought (3.3%), pest and diseases outbreak with 15.8%. The above findings are in line with Trobe (2002), who posited that climate change has already had an effect on physical and biological systems through out the world. Examples of these observed changes include. Lengthening of mid to high latitude growing seasons, pole ward and altitudinal shifts of plant and animal ranges, declines of some plant and animal populations, and earlier flowering of trees, emergence of insects, and egg-laying in birds. More over sea levels have shown signs of rising, and in some regions, including within Africa and Asia, floods and droughts have been observed to increase in recent years. Many rural farmers in developing countries, are

already seeing the effects of climate change daily in reduced availability of water for their agriculture.

### Social Networks and Climate Change

**Table 4 Social Networks in the study area.**

<b>Social Networks</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Age grades	73	60.8
Town Unions	70	58.8
Co-operative society	41	34.2
Elders forum	43	35.8
Labour groups	2	1.7
Fadama Associations	14	11.7
Religious group	61	50.8
Marketing Associations	10	8.3
Financial groups	4	3.33

Field survey

Table 4 shows the various farmers social networks that exist in the study are 60.8% of the respondents indicate that age grade is a popular group or social network in the area. Other social networks in the study area include town unions (58.8%), religious group (50.8%), cooperative societies (34.2%), elders forum (35.8%), Fadama user groups/Associations (11.7%), Marketing Association (8.3%) financial groups (3.3%) and labour group with (1.7%).

### Roles of Social Networks and Radio

**Table 5. Roles of Social Networks and Radio plays**

<b>Roles of Social Networks and Radio</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Financial services to farmers	19	15.8
Farm inputs purchase and distribution	26	21.7
Farmer labour for members	4	3.33
Resolution of conflicts among members	30	25
Reduce purchasing price of farm inputs	26	21.7
Education of farmers	49	40.8
Protection of environment	9	7.5
Farmers access to credit	37	30.8
Provision of climate information to farmers	44	36.7
Platform for knowledge exchange among farmers	56	46.7
Public education	16	13.3
Awareness rising on various adaptation measures	18	15

Multiple Response

Table 5 Outlines the numerous role of both farmers social networks and radio. The table shows that farmers social networks are platform for knowledge exchange change among farmers as shown by 46.7% response, education of farmers with 40.8% response is another vital role of farmers social networks. Provision of climate information with 36.7% response is also a very important role. Other important and vital roles includes, farmers access to credit with 30.8%

response, resolution of conflict among members with 15% response, farm input purchase and distribution with 21.7%, reduce purchasing price and farm inputs also with 21.7% response, financial services to farmers with 15.8% response, Awareness rising on various adaptation measure, with 15% response. Other farmers social networks are public education with 13.3%. protection of environment with 7.5% response and finally farm labour for members with 3.3%. The above findings are in line with Ifejika (2008), who posited that through self-organization, the farmers themselves have ownership of the group formation process and define their own agenda contrary to cases where the agenda is externally driven.

- ❖ Through cooperation the farmers increase their social capital, and their access to information, and through exchange with other farmers and their own experiences learn about new developments.
- ❖ As a member of a group, farmers gain the capacity for collective action or joint enterprise (WRI 2008). And through group/organizations become a social force and actor that shapes development. This contributes to social capital and in effect to buffer capacity.

By facilitating access to livelihood capital (financial services, technical information), farmer organizations play a critical role in increasing buffer capacity (to deal with risks, shocks and uncertainty) and by extension enhance environmental, economic and social resilience. Self – organization thus contributes to the other components of resilience (buffer capacity and capacity for learning) and is equally self-reinforcing. It forms the basis for networks and institutions, which again reinforce self-organization. Through participation and networking the farmers gain new tools to survive, (WRI 2008). With climate change, farmers will need to acquire new knowledge on the management of new crops and dealing with unaccustomed weather/climate conditions. In addition, the expected trend of rising agricultural prices means they will need access to cash. And going by the current procedure of group liability by the rural finance institutions, a poor farmer will have to be a group member to be able to source such credit. Finally, it needs to be mentioned that badly-managed farmers groups have also undone positive contributions to resilience through mismanagement of funds and sowing mistrust among members. Rebuilding trust should thus be the goal in such situations.

## CONCLUSION

The results generally shows that farmers in Owerri West Local Government Area of Imo State were very much aware of climate change and its effect on agriculture. Most of the farmers belongs to one membership organization or social networks where they interact, share and exchange ideas with each farmers, gain informations about climate change and its adaptive measures, and their problems solved such as farm access to credit, resolution of conflicts, education of the farmers, financial services and farm inputs etc. High rainfall=, flooding, erosion and hot temperature (heat) etc are the major threat farmers in Owerri West have noticed some effects. The following recommendations are made. (a)The farmers in the study area should be more sensitized or educated about climate change, their impact solution and modern adaptation measures. This could be achieved by organizing seminars, conference and programmes on climate change regular for them. (b) Government should established links and collaboration with the farmers and their various social networks including research institutions and meteorological centers. This will help them access



information, design appropriate and affordable adaptation measure to climate change on time. (c) The farmers in the study area should be provided with loans at low interest rate to enable buying radio and other materials in order to secure media informations on climate change. Therefore, there should be collaboration between researchers and the farmers to enable smooth operations and effective communication on adaptive measures on climate change.

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