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Research Article

The Role of Radio Stations in Creating Awareness of Climate Change among Crop Farmers in Abia State

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ABSTRACT: Radio is a very important medium in creating awareness of issues. The extent to which radio stations in Abia State, Nigeria are making farmers to be aware of climate change was examined in this study. The study majorly adopted the survey research design. A total of 80 copies of questionnaire were administered: 25 to crop farmers in each of the three Senatorial Zones of the state; and the remaining 5 to the 5 radio stations in the state. The questionnaire was divided into parts A and B: A for the crop farmers; and B for the radio stations. The data collected were analyzed using simple percentage and Chi-square statistical techniques. The results revealed that 78% of the farmers have low or no knowledge of climate change. Similar result was obtained in the testing of hypothesis one, where H_0 was rejected implying very low knowledge of climate change by the farmers. Only 2 radio stations out of 5 in the study area have programmes on agriculture where climate change issue has ever been discussed. With regard to source of awareness of climate change, only 20% of the respondents got it though the radio while 52% got from personal observation. H_0 was accepted in the testing of hypothesis two, implying that climate change has adversely affected the yields of crops in Abia State. The farmers are adapting to climate change by planting fast maturing varieties of crops; early or late planting of crops; increasing mulching of crops to conserve moisture and reduce heat; and staking of crawling crops. It is therefore concluded that food security in the study area is being threatened as very few crop farmers are aware of climate change. Radio stations in the state that are without agricultural programmes where climate change is discussed should introduce one.

Keywords: Radio Station, Awareness, Climate Change, Crop Farmers, Abia State.

I. INTRODUCTION

Radio is widely used as a mass communication medium and has a great potentiality in disseminating information as radio signals cover almost entire population. Radio being a convenient form of entertainment caters for a large audience (Payal, 2012). It has advantages over the other mass media like television and newspapers in terms of being handy, portable, easily accessible and cheap (Department for International Development (DFID) Research, 2012). Radio is the most portable of the broadcast media, being accessible at home, in the office, in the car, on the street or beach, virtually everywhere at anytime. It is effective not only in informing the people but also in creating awareness regarding many social, economic, political and environmental issues (Kakonge, 2011). In the developing countries, radio is the powerful and effective medium to project the information and knowledge related to agriculture (Nakabugu, 2001; Food and Agricultural Organization (FAO), 2001). As the farmers receive useful information from radio, gradually they bring change in farming methods applying new technologies (Daramola, 2003; Khanal, 2011).

Generally, agricultural activities mostly food crop production are climate dependant, especially in Nigeria as any change in the ideal plant requirement may affect the overall yield and productive capacity of the crop (Odewumi *et al*., 2013).

Presently, climate is said to be changing and it is affecting agriculture depending on the region. Climate change, which refers to long shift in climate pattern of a specific location, region or planet measurably by changes in features associated with average weather components of temperature, wind patterns and precipitation (Warrick and Barrow, 1991, Nwagbara *et al*.,2009), is the result of the great many factors including the dynamic process of the earth itself, internal forces including variation in sunlight intensity and more recently by human activities. This calls for monitoring of climate change and dissemination of information or creating of climate change awareness to farmers to encourage adaptation. Radio can play a vital role in creating awareness about climate change.

Crop farmers need to clearly understand this interdependence of climate variables and agriculture in order to fully understand the concept of climate change. It is important to note that despite the awareness of climate change and its impact on agriculture, must farmers especially in Africa do not really understand this phenomenon, and it has been said that the perception of farmers about climate change will go a long way to determining the extent of adaptation that will be adopted by farmers (Adams *et al*., 1998; Smith and Skinner, 2002).

Effective communication of useful information will be critical

to help farmers adapt to climate change (Pam, 2007). Radio is the most effective way to share their knowledge and experience (Maria *et al*., 2013; Onkargonda *et al*., 2013). African farmers are experienced at dealing with climate variations and have a rich heritage of methods to deal with changes. There is a great deal of information available on climate change. But most is not aimed at a farming audience (Vijah, 2009; Pradeep and Ingita, 2013). The challenge for radio broadcaster is to ensure that their audience understands climate change message and finds them relevant. Radio can encourage communities to assess local problems and identify local solutions to climate change. Radio programmes that talk to farmers about climate change can provide researchers with knowledge of what is happening at the field level and encourage communication between researchers and farmers (James, 2009).

From the foregoing, there is a good relationship between crop farming or agriculture in general and climate, and by extension climate change. Therefore, the extent to which and how often this relationship is presented as programme in radio stations in Abia State are examined in this study, and the following hypotheses postulated: Awareness of climate change among crop farmers in Abia State is very high; and There is no significant difference between the yields of crops before and after climate change.

II. BODY TEXT

A. *Study Area*

The study area is Abia State. It is one of the 36 States in Nigeria and lies between latitudes 4^0 45' and 6^0 00' North and longitudes $7^0$00' and $8^0$09' East (Figure 1). The State shares boundaries with seven: Imo State is in the west, Anambra State in the north-west, Enugu State in the north and Ebonyi State in the north-east. In the east and south –east, it is bounded by Cross River and Akwa Ibom States and by Rivers State in the south. It occupies a total area of about 6,320 square kilometres (Nwagbara and Uzowulu, 2015). Abia State is divided into 17 Local Government Areas (LGAs). These LGAs have been grouped to form three senatorial zones as it is the case in other states of Nigeria. The senatorial zones are namely North, Central and South. The state is largely inhabited by Igbo people (one of the three major ethnic groups in the country). It had a population of 2,833,999 in 2006 (National Population Commission (NPC), 2007). With the total area of 6,320 square kilometres, it means that the state has a population density of approximately 448 persons per kilometre. The predominant economic activities of the people are subsistence agriculture and commerce. The state has much arable land that produces yams, maize, potatoes, cassava etc. Agriculture which employs 70% of the workforce is the second economic sector (Abia State Government, 2011). Abia State experiences a high annual rainfall (about 2000mm per year) thus making relative humidity to be high throughout the year, reaching a maximum during the rainy season when values above ninety percent (90%) are recorded (Golden, 2013). The rainy season peaks in July and September. The hottest months are January, February and March when the mean temperature is above 27℃ with the temperatures ranging between about 21.8℃ and 31.2℃ (Nwagbara and Uzowulu, 2015).

B. *Materials and Methods*

The data used for this study were from two sources namely primary and secondary sources. The primary data were obtained using questionnaire and oral interview. Where the respondent cannot read and write, the author interpreted the questions in the questionnaire in the local language which is Igbo and answers to the questions written in English. The secondary source of data involved the use of relevant literature, magazines, journals, textbooks, library internet facilities and other research materials of related topics to the role of radio in creating awareness on climate change.

The population from which the sample frame for the research was drawn from comprised the three senatorial zones of Abia State namely north, central and south. A Total of 80 (Eighty) questionnaire sheets were distributed, 25 (Twenty-five) each to the crop farmers from the three senatorial zones, implying a total of 75 crop farmers. The remaining 5 (Five) questionnaire sheets were given to the five radio stations in the state namely Broadcasting Corporation of Abia State, Vision Africa Radio, Family Love FM, Pacesetter Radio and Magic FM.

The following statistical tools were used in this study:

Percentage (%) $= \frac{e}{n} \times \frac{100}{1}$ ---------- (1)

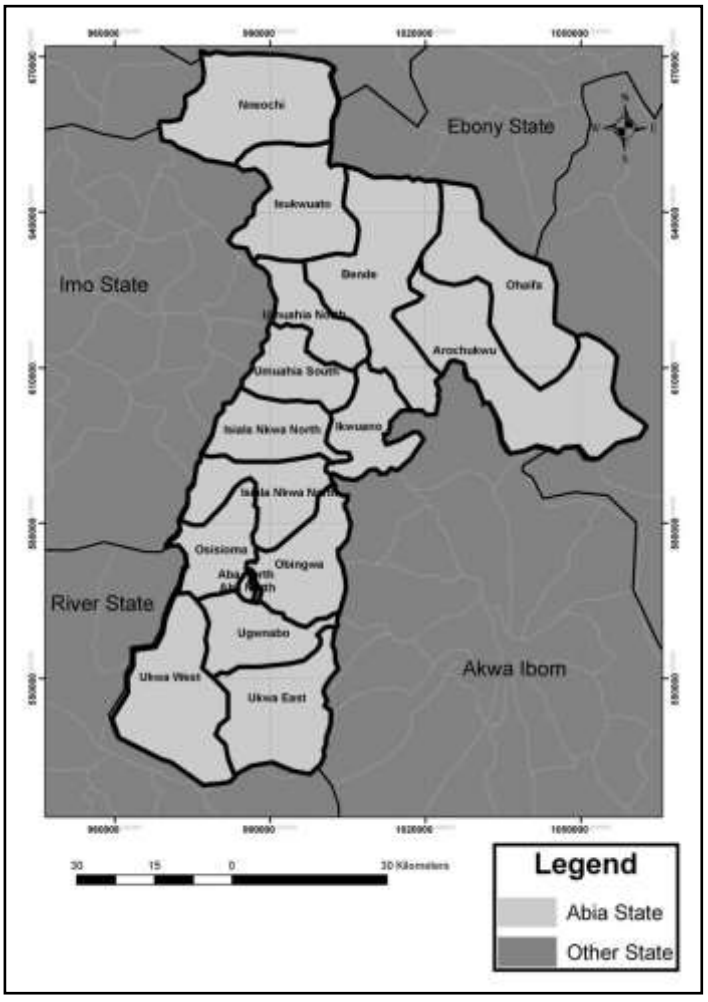

Figure 1: Abia State: Study Area

Where e is the number of each response, and n is the total number of responses.

The chi- square which is expressed as:

$$\chi^2 = \sum \frac{(O-E)2}{E} \quad \text{- (2)}$$

Where O is observed frequency and E is expected frequency.

Expected frequency (E) = $\frac{(Total\ Row\ Response)}{Total\ Responses}$ - - - - (3)

Degree of Freedom (d.f) = (n – 1) - - - - - - - - - - (4)

Where n = number of row responses

The test was carried out at 0.05 or (95%) level of significance.

Descriptive statistical tools or analyses were applied which includes: percentages, tables, pie and bar chart.

III. RESULTS AND DISCUSSION

In Table 1, out of the 80 respondents, 50 (62.5%) were males while 30 (37.5%) were females.

Table 1: Gender of Distribution Respondents

S/N	Gender of Respondents	Frequency	Percentage
1	Males	50	62.5
2	Females	30	37.5
Total		**80**	**100**

The ages of the respondents were also captured by the questionnaire. This is presented in Table 4.2. The ages of the respondents are important here as they form a strong basis for determining who has lived long enough to experience a change in climate since climate deals with a period not less than thirty (30) years. It also be seen in this Table 4.2 that farmers aged 51 years and above were only 10 (that is, 13.4%) interviewed. This is not surprising owing to the fact that many people within this age bracket are not as active as those in the 41 – 50 age bracket in crop farming due to health challenges in the study area where farming activities are highly manual. In other words fewer persons above the age of 50 are involved in crop farming, and so also the number of copies of questionnaire administered. The highest number of copies of questionnaire was

Table 2: Age Distribution of Respondents (Farmers)

S/N	Age	Frequency	Percentage
1	31-40	25	33.3
2	41-50	40	53.3
3	Above 50	10	13.4
Total		**75**	**100**

administered to farmers ages 41 – 50 (that is, 53.3%). This group is still strong enough for the kind of farming in the study area which involves so much physical exertion. For the last group, 31 – 40, is made up of people who are recent entrants into active crop farming after leaving school or trade. Therefore, they are not as many as those within the ages 41 and 50. Table 2 indicates that 25 of them received a copy of the questionnaire each, implying 33.3% of the total number administered.

On the educational status of the respondents, Table 3 reveals that 60 respondents, that is, 75% of the respondents, can read and write since the least educated respondent had a primary school education. This implies that this number was able to fill the questionnaire without the aid of the author or anyone. It also implies that only 20 respondents had no formal education since a total of 80 respondents were involved in the survey. For the 20, the author helped out in reading out the questions to the respondents and wrote their responses in the questionnaire. Among the respondents, those with primary school education has the highest number, 40 (that is, 50%) whereas those with tertiary education make up only 6.25% as the least (that is, 5 respondents).

Table 3: Educational Status of Respondents

S/N	Educational Status	Frequency	Percentage
1	Tertiary Institution education	5	6.25
2	Secondary School education	15	18.75
3	Primary school education	40	50
4	No formal education	20	25
Total		**80**	**100**

Table 4 shows the length of time in years respondents have spent in crop farming. In the table, 35 respondents (that is, 46.7% of the respondents) have been in crop farming for 31 to 40 years, thus making it the years of experience of the greatest number of respondents. Those with 1 to 10 years experience are only 5 (that is, 6.6% of the respondents) while the least number of respondents, 3 (that is, 4%), said they have got more than 50 years experience in crop farming. This number is not surprising since many crop farmers with this number of years experience would have retired from farming or too weak for energy sapping type of crop farming in the study area as it is the case in most developing countries.

Table 4: Years of Experience in Crop Farming

S/N	Years	Frequency	Percentage
1	1-10	5	6.6
2	11-20	9	12
3	21-30	11	14.7
4	31-40	35	46.7
5	41-50	12	16
6	Above 50	3	4
Total		**75**	**100**

Table 5 presents the number of years the farmers interviewed have resided in the study area. With such information, it becomes easier to determine how qualified those who were interviewed were to say whether climate change has occurred

in their area or not and its effects on the yield of crops (if it has occurred). For example, those who have stayed in the study area 30 years and above made up 81.33% of those interviewed (that is, 61 respondents out of a total of 75) as compared with 18.67% for farmers (that is, 14 respondents out of a total of 75) who have lived in the study area for 29 years and below. The implication of this is the most of the farmers are in good position to say whether the climate of the study area has changed or not.

Table 5: Length of Years Farmers Have Resided in Study Area

S/N	Years	Frequency	Percentage
1	Above 49	10	13.33
2	40-49	21	28
3	30-39	30	40
4	20-29	11	14.7
5	Below 20	3	4
Total		**75**	**100**

The issues treated by Tables 4 and 5 viz. Years of experience in crop farming, and Length of years farmers have resided in study area, were meant to show the extent to which the respondents were competence to discuss the extent of climate change in the area of study. Even where the farmer has not farmed or lived in the study area for 30 and above, he could have a reasonable idea of what has happened or is happening to the climate of the area.

The level of awareness of climate change by crop farmers in Abia State is presented in Table 6. The respondents were asked to state their awareness level of climate change. Most respondents, 52% of them (that is, 39 respondents), indicated that they have low knowledge of climate change whereas only 12% of them (that is, 9) said that they have high knowledge of the change. Among the respondents, 20% (that is, 15 respondents) stated that they have no knowledge at all of climate change. Those with high and moderate levels of climate change awareness made up of 28% of the respondents (that is, 21 of them). The responses of the respondents closely concurred with the work

Table 6: Awareness Level of Climate Change by Respondents

S/N	Level of Awareness	Frequency	Percentage
1	High	9	12
2	Moderate	12	16
3	Low	39	52
4	No	15	20
Total		**75**	**100**

of Odjugo (2013) which discovered that only 22% of the respondents in Nigeria have much knowledge of climate change and only 9% of them are from the rural areas. Based on this he concluded that information on climate change in the grassroots or rural areas is poor. He further stated that such level of awareness of climate change at the grassroots is good for Nigeria's economy as the rural area holds the agricultural strength of the country.

Based on Table 4.6, which deals with the level of awareness of climate change of the respondents, hypothesis one which states thus, $\mathbf{H_0}$: Awareness of climate among crop farmers in Abia State is very high, and $\mathbf{H_1}$: Awareness of climate change among crop farmers in Abia State is very low was tested using the Chi-square statistical technique (χ^2) (see Table 7).

Table 7: Chi-Square Analysis of Climate Change Awareness among Crop Farmers in Abia State

	High	Moderate	Low	No	Total
Observed frequencies	9	12	39	15	75
Expected Frequencies	18.75	18.75	18.75	18.75	75

After the subjecting the data in Table 7 to Chi-square (χ^2) calculation, the following results emerged:

χ^2 = 30.12 (calculated value)

The degree of freedom (V) = 4 - 1 = 3

At 0.05 level of confidence, critical value = 7.81

Based on the results above, with the calculated value of 30.12 being more than the critical value of 7.81, Ho is rejected. Thus, there is very low awareness of climate change among crop farmers in Abia State. This implies that the farmers are highly vulnerable to the adverse effects of climate change. The result also implies that the five radio stations in the study area are not living up to their primary duty or function of educating the people on issues of public concern especially as it has to do with climate change which is global concern.

Table 8 indicates the names and locations of the radio stations, and listenership of crop farmers to them in the study area. The farmers' listenership to the radio stations vary conspicuously. The Pacesetter FM (Radio Nigeria), Umuahia, had the greatest listenership by the respondents. Of the farmers interviewed, 33.3% of them said they listen majorly to the Pacesetter FM (Radio Nigeria), Umuahia. This is followed by Vision

Table 8: Listenership of Radio Stations in Abia State

S/N	Radio Station	Listenership (%)
1	Broadcasting Corporation Abia State (BCA), Umuahia	10.7
2	Vision Africa Radio, Umuahia	20
3	Pacesetter FM (Radio Nigeria), Umuahia	33.3
4	Family Love FM, Umuahia	20
5	Magic FM, Aba	16

Africa Radio, Umuahia and Family Love FM, Umuahia with 20% for each. The least listened radio station is the Broadcasting Corporation Abia State (BCA), Umuahia with only 10.7% listenership by the respondents.

Table 9 reveals that only two radio stations in Abia State have

agricultural programmes where they once in a while discuss climate change issues. These stations are Broadcasting Corporation of Abia (BCA), Umuahia and Magic FM, Aba. Incidentally, these two stations are poorly listened to by crop farmers in Abia State (Table 8). This explains the low or poor level of awareness of climate change by the respondents (Table 6). Those who are aware of climate change were asked to indicate their source of information. Majority of them, 52%, as shown in Table10 got to know of changes in climate mainly through their personal observation, followed by radio, 20%, extension agents, 10%, farmers' cooperatives, Newspapers and Television, 18%.

Table 9: Radio Stations and Availability of Agricultural Programme with Discussions on Climate Change

S/N	Radio Station	Response
1	Broadcasting Corporation of Abia (BCA), Umuahia	Yes
2	Vision Africa Radio, Umuahia	No
3	Pacesetter FM (Radio Nigeria), Umuahia	No
4	Family Love FM, Umuahia	No
5	Magic FM, Aba	Yes

This revelation shows the importance of these channels of communication in information dissemination, hence should be patronized especially radio in passing information about climate change to crop farmers. Basically, radio, just as other mass media, is meant to inform and educate the people. Creation of awareness of climate change is majorly to reduce its impact. Radio is effective not only in informing the people but also in creating awareness regarding many issues and need for reformation, developing interest and initiating actions. Corroborating, Shanaghan (2007, 2011) and Sharma (2008) stated that radio has advantages over the other mass media like television and newspapers in terms of being handy, portable, and easily accessible at

Table 10: Source of Information on Climate Change by Respondents

S/N	Source	Respondents	Percentage
1	Radio	15	20
2	Personal Observation	39	52
3	Extension Agents	7.5	10
4	Farmers' Cooperatives, Newspapers and Television	13.5	18
Total		**75**	**100**

home, in the office, in the car, on the street, in the farm, virtually everywhere at anytime. Radio has been proved to be an important tool in the enhancement of agriculture in rural areas. Nakabugu (2001) and FAO (2001) affirmed that in the developing countries such as Nigeria, radio is a powerful and effective medium to project the information and knowledge related to agriculture.

Those that indicated radio as the source of their information on climate change (that is, 20%) said they heard it from Broadcasting Corporation of Abia State (BCA), Umuahia and Magic FM, Aba (see Table 9). This means two stations out of the five in Abia State. When asked what their perceived causes of climate change were, 60% of them attributed the changes to Act of God and 40% of them attributed it to human activities which include of industrialization, Urbanization, transportation and agriculture that release greenhouse gases into atmosphere (see Table 11).

Table 11: Perceived Causes of Climate Change by Respondents

S/N	Perceived Causes of Climate Change	Respondents	Percentage
1	Act of God	45	60
2	Man's Activities	30	40
Total		**75**	**100**

Odjugo (2013) equally listed these human activities as the causes of present day climate change. The perception of the respondents about the causes of climate change is clearly an indication of their poor knowledge of climate change implying that the radio stations in Abia State are failing in educating and creating awareness of an issue (climate change) which is of global interest especially as it affects crop production and food security.

The crop farmers in the study area were asked to state the intensity of the indices of climate change on their crop production. The perceived intensity impacts of climate change by the respondents were based on the following indices: Decreased rainfall amount; unusual heavy rainfall; unexpected rainfall; changes in rainfall pattern; increased cases of flooding; prolonged drought; High temperature and heat; and Increase in pest and disease problem. Others were Heavy winds; Reduction in crop yield; Heat stress on crops leading to burning; and stunted growth of crops. The impact of climate change identified by the respondents (crop farmers) especially the three outstanding the impact of changing rainfall pattern, prolonged drought and increasing temperature are the actual climate change problems affecting crop production. These identified impacts are having scientific backing because the performance of crop production is depended on a large number of climatic factors. The most important climatic factors include rainfall, temperature and relative humidity. These play an important role in the realization of higher or lower crop yields depending on their trends.

Chi-square statistic was employed in the testing of hypothesis two which states thus: $\mathbf{H_0}$: There is no significant difference between the yields of crops before and after climate change, and $\mathbf{H_1}$: There is significant difference between the yields of crops before and after climate change as in Table 12.

Table 12: Chi-Square Analysis of Farmers Response to Question on Yields of Crops Before and

After Climate Change

	Favourable	Adverse	Total
Observed frequencies	15	60	75
Expected Frequencies	37.5	37.5	75

Subjecting the data in Table 12, the following results were got:

$\chi^2 = 2.48$ (calculated value)

There are 3 parameters

The degree of freedom is V= 3 – 1 = 2

At 0.05, critical value = 5.99

Since the calculated (χ^2) of 2.48 is less than the critical value of 5.99, H_0 is accepted. Thus, there is a significant relationship between climate change and crop production. The implication of this is that indeed climate change is affecting crop production in Abia State. This is most worrisome as the change is on the adverse side as yields of crops are reducing, which means reduced returns from farming for the farmers and less food for the market and by extension for the people. In other words, there is a threat to food security in the study area.

Mark *et al*. (2008) highlighted some of the direct impacts of climate change on agricultural systems to include seasonal changes in rainfall and temperature, which include uttering growing seasons, planting and harvesting calendars, water availability, and weeds, pests and diseases population. In Table 13, the respondents in the study area enumerated some major measures they are using to remedy the impacts of climate change. These adaptation methods/mitigation strategies include planting of fast maturing varieties of crops; early or late planting of crops; increase mulching of crops to conserve moisture and reduce heat; and staking of crawling crops such as yam to avoid burns.

Table 13: Major Adaptation Methods by Respondents

S/N	Adaptation Methods
1	Planting of fast maturing crop varieties
2	Early or late planting of crops
3	Mulching of crops
4	Staking of crawling crops

The adaptation measures identified by the respondents are in line with the findings of earlier researchers, for example Onyeneke (2010), Enete and Amusa (2010) . They listed the measures they found to include use of new crop varieties that are suited to drought; crop diversification; changing planting dates; radical departure from reliance on rain-fed food production to irrigation farming; and growing of cover crops like potatoes and melon to protect soils from erosion. However, Yohe *et al.* (2007) observed that in any given context, the identified adaptations may be constrained by factors such as their expense; lack of knowledge etc. These impediments notwithstanding, farmers who are at risk of climate change can be provided with the needed awareness, advice and guidance.

IV. CONCLUSION

In this research work, attention has been on the role of Radio Stations in Abia State in creating awareness on climate change among crop farmers in Abia State. The study revealed that the demographic and socio-economic characteristics of the respondents of gender, age, educational status, length of years farmers have resided in study area and farming experience have influence on their views about climate change discussion and analysis. These require longer living period within the study area. 75% of the respondents do not have much knowledge about climate change 28% of them who claimed to have knowledge of climate changes got to know it through personal observation and from radio. Many attributed it to Act of God, instead of the scientific factors.

The respondents are aware that the climate is changing because of what they have observed. Changes in terms of increase in temperature, changing in rainfall pattern (for example onset and cessation of rainfall), prolonged drought which to them have adverse impact on their crop production. However, the respondents enumerated some measures of remedying the effects through planting of fast maturing crop varieties and planting of different varieties of crops among others.

From the responses of the Radio Stations, it was discovered that there are no specific or special programme on climate change and its impact on crop aired by them. Even where agricultural programmes exist, there is little or no emphases on climate change. Indeed. This is a great challenge to radio stations in the study area (Abia State). The respondents that answered yes to the question of awareness of climate change from radio stations suggested that such programme should be aired regularly. This is based on what they have gained from the awareness of climate change.

Public awareness and enlightenment on climate change using the mass media like radio should be encouraged. Such enlightenment should be in simple English and local dialects of the audience.

The radio stations should once in a while invite climatologists to educate especially crop farmers on the impact of climate change with regard to crop farming, adaptation measures and mitigation strategies. It should be an interactive or call in programme, so as to give crop farmers opportunity to ask questions.

Since climate change is a major threat to food security not only in the study area but in many regions of the developing world, other means of communication outside radio should be employed too to create the needed awareness of climate change to crop farmers.

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