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Information Sources and Awareness of Climate Change by Citrus Farmers in Benue State, Nigeria

Adebisi-Adelani[1], O. and [2] Oyesola, O.B.

[1]Farming System and Extension Department, National Horticultural Research Institute, Ibadan   Corresponding e-mail: adelanidotol@yahoo.com 08059221500
[2] Department of Agricultural Extension and Rural Development, University of Ibadan, Ibadan, Nigeria

Abstract

The need for information by farmers in this era of climate change is very crucial to their production. The study therefore examines the various sources of information available to farmers on climate change and their level of awareness. Multi stage sampling procedure was used to select 123 respondents out of the total number of 1230. Primary data were collected using interview schedule and Focus Group Discussions (FGDs). Data were analysed using descriptive statistics such as frequencies, percentages and pie charts; while inferential statistics used were Pearson Product Moment Correlation (PPMS) and chi-square. Results revealed that 64.2% of the respondents were between the ages of 35-45 years, 94.3% were married and 45.5% had 10 – 20 years of farming experience. Thirty- seven percent have been noticing change in climate for between the periods of 6-10 years; while 91.9% stated that they were aware of general decrease in yearly amount of rainfall. Their major information source is family member (91.9%), followed by radio (86.7%). Analysis of data from FGDs revealed that respondents were aware that there has been less rainfall in the past 2 years when compared to 3-5 years ago. P=0.05, age (x^2=0.000), education (x^2=0.005) and experience (x^2=0.001) were significantly related to information sources. In conclusion, the study has shown that majority of the respondents were aware of the change in climate and their major source of information was family members and radio and not through extension agents. Therefore there is the need for an urgent strengthening of extension arm in Nigeria.

Key words: Climate change, Awareness, Information sources, Citrus farmer

Introduction

Climate change is no longer a new phenomenon in Nigeria especially among farmers. It has become a major challenge to agricultural development in Africa and the world at large. Agriculture, being one of the most weather-dependent of all human activities, is highly vulnerable to climate change. Climate change threatens agriculture production through rising temperatures, changes in rainfall patterns or the increase of drought. This is directly linked to reduced soil productivity and to a higher incidence of pests and diseases. Horticultural crops such as mango, citrus, pepper and tomatoes are dependent on climatic factors for their growth, so, they are not left behind in the effect of climate

change. World production of citrus fruit has experienced continuous growth in the last decades in the 20th century (UNCTAD, 2005). According to FAO (2004) as reported by UNCTAD (2005), the main producing countries of citrus species are indicated in Table 1.

Table 1: Major producing countries of the different types of citrus fruits

Citrus Fruit	Countries
Oranges	Brazil, United States, Mexico, India, Spain, China, Iran, Italy, Egypt, Indonesia
Small citrus	Nigeria, China, Syria, Guinea, Japan, Saudi Arabia, India, Sierra Leone, Angola, Tunisia.
Lemons and limes	Mexico, India, Iran, Spain, Argentina, Brazil, United States, China, Italy, Turkey.
Grapefruit	United States, China, South Africa, Mexico, Israel, Cuba, Argentina, India, Turkey, Tunisia

Source: UNCTAD (2005).

The flowering stage of fruit trees is susceptible to heavy rainfall. The fact that agricultural production in Nigeria is primarily rain–fed further reinforces the importance of climate to agriculture. Farmers had to live with the realities of climate change to be able to manage the situation and to maintain their enterprise. The knowledge of farmers about climate issues depend on their accessibility to information on weather forecasts, degree of control they have over their resources, among others. Generally, inadequate extension service in terms of personnel for farmers to get information is a serious problem to agricultural development in Nigeria, not only in crop production but in accessibility to information about climate change as well. Farmers' adequate knowledge and information about climate change will give them ability to adapt at any point in time. Information about future changes in climate is vital for making good decisions, as farmers are likely to adjust their farming practices in response to climate change. Thus, there is the need to identify the different sources of information available to horticultural farmers in this era of climate change and their level of awareness of the change. The following specific objectives were pursued to proffer solution to the general objective.

1. Identify the personal characteristics of the citrus farmers
2. Assess the respondents' awareness of changes in major climate parameters in the study area
3. Identify citrus farmers' sources of information on climate change

Hypotheses

H_01: There is no significant relationship between information sources utilized by respondents and their awareness of changes in climate in the study area.
H_02: There is no significant relationship between selected personal characteristics of respondents and their information sources of climate change in the study area.

Methodology

The study was carried out in Benue state of Nigeria. The state is located in the middle belt of Nigeria. The State shares boundaries with five states. It has a total land area of about 30,955 square kilometres and administratively divided into twenty-three Local Government Areas. The state has a population of 4,219,244 people according to 2006 population census. Benue state is referred to as the food basket of Nigeria because of the abundance of its agricultural resources. About 80% of the state population is estimated to be directly involved in subsistence agriculture. (Agricultural Development Project Bulletin, 2008) Tree crops like oil palm, cashew mango, coconut, bananas and citrus grow well in the state, including food crops and grains. Multi-stage sampling technique was used to arrive at the sample used for the study. The stages include:

First stage- Selection of zone: According to ADP zoning system in the state. Benue state has three zones namely Zone A, B and C. Zone A was randomly selected.
Second stage- Selection of blocks: Zone A consists of seven blocks, 25% of the blocks were randomly chosen to have Buruku and Yandev.
Third stage- 50% of cells was randomly selected.
Final stage- 10% of citrus farmers (producers) were randomly selected from the generated list of 1230 from the selected cells. Sample size was thus 123.

Data for the study was collected with the use of qualitative (Focus Group Discussion), secondary data (weather data) and quantitative (pre-tested structured interview guide) method. During the FGD a group of twelve citrus farmers consisting of males and females were interviewed. Data were analyzed using both descriptive (frequencies, percentages) and inferential statistics (PPMC and Chi-square).Awareness level was arrived at by calculating the awareness score, the mean score was realized scores below the mean were termed low while those above the mean were termed high. The same is applicable to information score using access to information.

Results and Discussion

Personal characteristics of the respondents

Age distribution of respondents as shown in Table 2 revealed that the farmers mean age was 44.6 years. It showed that 64.2% of the respondents were between the ages of 35-45 years while 26.0% were between the ages of 46-55 years. This shows that most of the citrus farmers were still in their active years. This finding is consistent with that of Yekinni (2010) who reported a mean age of 43.24 years for farmers in Nigeria. It is believed that farmers who are active will be sensitive to their environment in terms of seeking information about weather and climatic changes. Younger farmers have been found to be more knowledgeable about new practices and may be more willing to bear the risks of adopting a new technology (Olaniyi and Rafiu, 2005). Responses to educational level revealed that 15.4% had primary education, 53.7% had secondary school education, while, and 22.0% had higher degrees. This results implies that majority of the respondents are literates which may have influence on their knowledge and information about the environment. Farming experience is germane to farm operations, activities and weather events. Farmers who had between 10-20 years of experience in citrus production were 45.5% which is the mode. This finding is in line with that of Oyedele (2005) that 42

percent of citrus farmers had 11-20 years of experience. Based on this they are in position to talk about changes in climatic parameters over the years.

Result on source of financial capital reveals that majority of the respondents (60.2%) are self financed. This implies that they had no access to loaning from the banks and thus they cannot sustain commercialization.

Table 2: Percentage distribution of respondents according to selected personal characteristics

Variables	Percentage	
Age		
35-45	64.2	
46-55	26.0	Mean = 44.6
56-65	7.3	
66-75	0.8	
>75	1.6	
Educational Qualification		
No formal	6.5	Mode=secondary
Primary education	15.4	Education
Secondary education	53.7	
Tertiary education	22.0	
Others	2.4	
Length of time of farming		
<10	8.9	Mode=10-20
10-20	45.5	
21-30	30.1	
31-40	7.3	
41-50	8.1	
Source of Financial Capital		
Bank loan	8.1	
Coop loan	21.1	
Self financed	60.2	Mode=Self financed
Friends and Relations	10.5	

Source: Field survey, 2011

Respondents' awareness of changing features of climate parameters

The result in Table 3 reveals that 91.9% of respondents were aware of the general decrease in yearly amount of rainfall, 83.7% of reduction in rainfall days and 74.8% of increase possibility of loss of soil nutrients. The result implies that Citrus farmers in Nigeria were aware of the changes that occur in climate parameters in recent years. The findings were consistent with Oyekale *et al* (2009) who reported that 58.6% of cocoa farmers in Nigeria were aware that there is low rainfall in recent years among other climatic phenomena. Awareness score was further calculated and it revealed that 66.7% of respondents had high level of awareness, while 33.3% had low level of awareness

(Table 4). This result confirms the general high level of awareness change in climate by respondents.

Figures 1 and 2 on rainfall and temperature distribution from secondary data also supported the findings that in using the lines of best fit, there was general decrease in yearly amounts of rainfall and slight increase in temperature. Farmers were also becoming aware of climate change.

Table 3: Distribution of respondents on awareness of climate change parameters

Statement	Percentage
General decrease in yearly amounts of rainfall	91.9
Intense Harmattan period	30.1
Reduction in rainfall days	83.7
Increased possibility of loss of soil nutrients	74.8
Prolonged dry season	54.5
Incidence of sand dunes	22.0
Wind dryness	32.5
Increased rainfall intensity	48.8
High Humidity	56.9
Increased frequency of drought in recent decades	74.0
Increased intensity of drought in recent decades	60.2

Source: Field survey, 2011

Table 4: Distribution of level of awareness of climate change by respondents

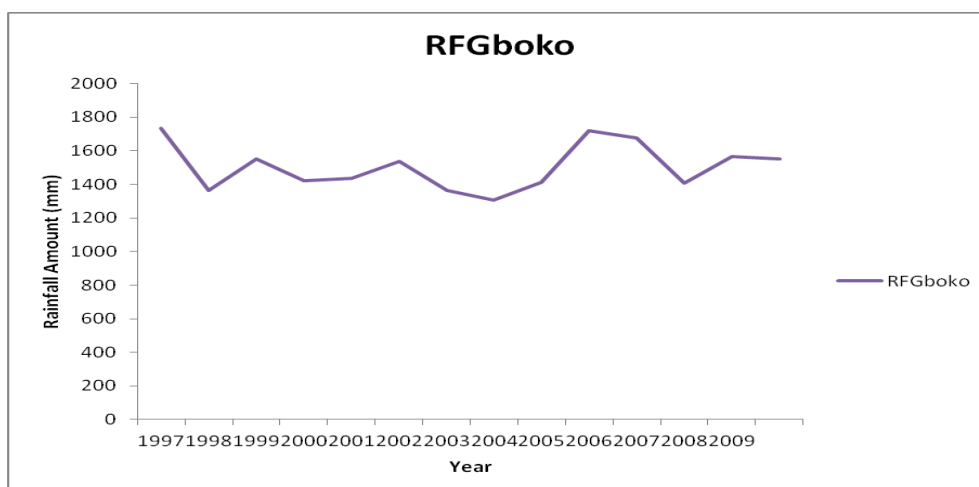| Awareness level	Percentage
Low	33.3
High	66.7
Total	100

Source: Field survey, 2011

Figure 1: Rainfall distribution between 1983-2009 in Gboko, Benue state
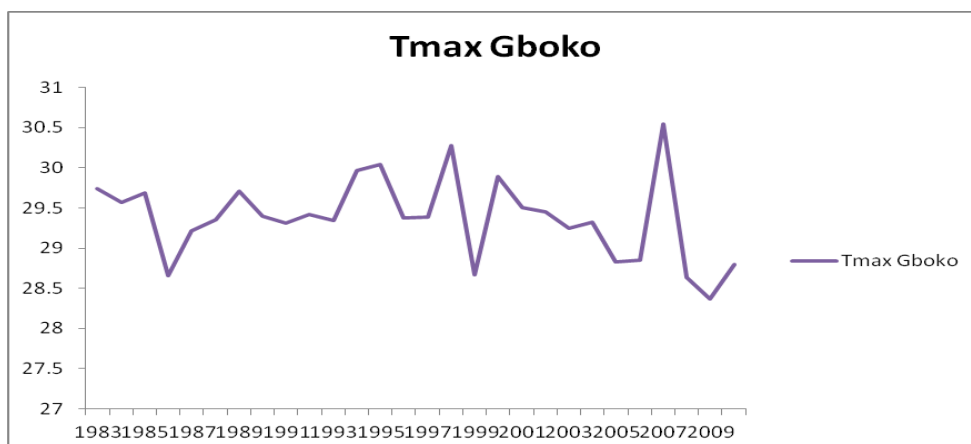Source: Stackhouse (2010)

Figure 2: Temperature distribution between 1983-2009 in Gboko, Benue state
Source: Stackhouse (2010)

Information sources available to respondents on climate change and their frequency of accessibility

The information sources available to the majority of the respondents (91.9%), is family members followed by radio, (87.0%), friends (82.1%) and GSM (69.9%) (Table 5). The result is an indication that there is a social tie among the Benue people. The rate of accessibility follows almost the same order in which percentage of respondents that access information at least weekly from Radio, Friends and GSM are 52.8%, 65.0%, and 51.0% respectively. During FGD farmers stated that they come together as a group to inform themselves about weather at the beginning of each year.

During FGD farmers stated that they come together as a group to inform themselves about weather each year. They even tell themselves to plant early or later in the year according to the dictates of the weather.

Table 5: Distribution showing information sources available to respondents on climate change and their frequency of accessibility

S/No	Information Sources	Yes	Once in a week	Once in 2 week	Once in a month	Once in 3 months	Once in 6 months	Once in a year
1.	Family members	91.9	74.0	7.3	4.1	6.5	0.0	0.8
2.	NIHORT	4.9	0.8	0.0	0.8	0.0	1.6	0.8
3.	Radio	87.0	52.8	17.9	6.5	4.9	3.3	1.6
4.	Television	52.8	30.9	4.9	10.6	2.4	3.3	0.8
5.	Newspaper	48.0	8.1	6.5	22.8	3.3	6.5	0.8
6.	Internet	29.3	3.3	4.9	10.6	2.4	4.1	4.1
7.	GSM	69.9	51.2	10.6	4.1	0.0	1.6	2.4
8.	Extension agent	17.1	0.8	2.4	2.4	2.4	2.4	6.5
9.	Training/capacity building	7.3	0.0	4.1	0.8	0.8	1.6	0.0
10.	Friends	82.1	65.0	6.5	7.3	0.8	0.0	0.8
11.	NGOs	17.1	0.8	2.4	0.0	2.4	4.1	7.3
12.	Billboard	2.4	0.0	0.0	0.0	0.0	0.8	0.8
13.	Fliers	1.6	0.0	0.0	0.0	0.0	0.8	0.8
14.	International community	5.7	0.0	0.0	0.0	0.0	4.1	0.8
15.	Government agencies	23.6	4.9	0.8	4.9	4.1	3.3	6.5
16.	Village network	72.4	53.7	4.9	2.4	8.9	0.0	1.6

*=Figures are in percentages.
 Source: Field survey, 2011

Categorization of information score

This result shows the categorization of information score into high and low level of information. Table 6 revealed that 55.3% of respondents had low level of information about climate change while 44.7% had a high level of information about climate change (Table 6). This is an indication that lesser percentage of citrus farmers in the study area had access to weather information through the various source identified.

Table 6: Percentage Distribution of respondents on Categorization of information score

Information score	Percentage
Low	55.3
High	44.7
Total	100.0

Source: Field survey, 2011

Pearson Product Moment Correlations (PPMC) analysis between information sources of respondents and their level of awareness of climate change

Table 7 shows that there was no significant relationship between information sources of respondents and their level of awareness of climate change. This is an indication that information sources had no significant relationship with farmers' level of awareness. Climate change is a natural occurrence and can easily be identified even without being told or informed.

Table 7: Corelation between information sources of respondents and their level of awareness of climate change

Variables	Correlation* Value(r)	P-value	Decision
Information sources on Climate Change vs level of awareness of climate change	-023	800	NS

*Pearson Product Moment Correlations
Source: Field survey, 2011

Relationship between selected personal characteristics and information sources of climate change

Table 8 reveals that age (χ^2=0.000), family size (χ^2=0.004), experience in farming (χ^2=0.001), education (χ^2=0.005) and being an indigene (χ^2=0.042) had significant relationship with respondents' information sources in the study area. This is an indication that the probability of younger folks seeking information is higher when compared to older ones. Relating to education, literate people are exposed to information when compared to the non literate. The result is in line with the qualitative result of the study whereby majority had at least primary school education.

Table 8: Relationship between selected personal characteristics and information sources of climate change

Personal characteristics	Chi-square value	df
Sex	39.985	43
Age	251.879*	172
Actual family size	605.233*	516
Experience	18.408*	5
Marital status	51.773	86
Education	67.952*	36
Religion	0.835	2
Being an indigene	6.361*	0.161

*$P< 0.05$
Source: Field survey, 2011

Conclusion and recommendations

The study concluded that respondents were younger in age and that majority had more years of experience in farming. Also, the respondents were mainly literates and they had

access to radio, friends and relations (family members) in getting information about climate change. It is recommended that family ties and group strengthening should be encouraged. Also, effort should be geared towards developing and making available citrus varieties that are tolerant to climate change such as flood, drought and temperature. A multi-media enlightenment campaign should be put in place for citrus farmers. Information could be on billboard, or any other print media for farmers to read. Extension workers should be the main agents of information carrier to the grassroots. Therefore, there is the need for increase in extension - farmer ratio so that farmers could be kept abreast of latest information about climate change. This will enable them to know how to move ahead with their farming practises and the type of adaptation strategies to put in place so as to combat the effect of climate change on their farming activities. Moreover, for Agricultural Transformation Agenda to be effective farmers should not rely mainly on their personal effort when it come to financing their farming activities, finance institutions like Bank of Agriculture should come into the scene to loan the farmers so as to increase their productivity, turning agriculture to business and therefore improving their livelihood.

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