Agricultural Researchers' Awareness of the Causes and Effects of Climate Change in Edo State, Nigeria

T. O. A. Banmeke (Corresponding author), E. O. Fakoya & I. F. Ayanda
Department of Agricultural Extension and Rural Development
University of Agriculture, P.M.B. 2240, Abeokuta, Nigeria
Tel: 234-805-530-9320 E-mail: tajudeenbanms@yahoo.com

Received: April 12, 2011 Accepted: April 30, 2011 Online Published: December 1, 2011
doi:10.5539/jas.v4n1p233 URL: http://dx.doi.org/10.5539/jas.v4n1p233

Abstract

The study assessed Agricultural researchers' awareness of the causes and effects of climate change in Edo State, Nigeria. Data for the study were collected from 112 respondents and were analyzed using descriptive and inferential statistics. Findings indicated that 45.5% of the respondents were between the ages of 31-50 years with 64.2% having a work experience of 5-10 years. Results revealed that 96.4% and 94.6% of the respondents were aware of gas flaring and oil spillage as causes of climate change. Also, 98.2% and 95.5% of the respondents were aware of increase in temperature and change in rainfall pattern respectively as some of the effects of climate change. There was a significant relationship between information sources and awareness of causes of climate change ($r = 0.32$; $p < 0.05$). It was recommended that agricultural researcher should be pragmatic and proactive in the pursuit of issues relating to climate change.

Keywords: Climate change, Researcher, Awareness, Effects

1. Introduction

Nigeria apart from being a major oil exporter has an agrarian economy that is predominantly dominated by small scale farmers. Apart from majority of the farmers being small-scaled, agricultural practices in the country is tied to climatic conditions such as rainfall to water their crops, sunlight for drying their farm produce amongst others. Also, climatic factors such as temperature, rainfall and wind are essential in crop growth, development, storage and these factors also set a limit to livestock productions. It therefore becomes imperative to note that climate change and agricultural processes are interrelated, since all the stages involved in agricultural production such as sowing, crop growth and development, storage and others are dependent on climate (Ayoade, 2004). Owing to the dependence of the country's agricultural system on climate and environmental factors, agricultural practices are continuously faced and prone to natural disasters (Rahimi, 2000).

Intergovernmental Panel on Climate Change (IPCC,2001) define climate change as a statistically significant variation that persist for decades or longer caused by human and non-human activities. Some human causes include deforestation, oil spills and gas flaring, while some non-human causes include volcanic eruptions and ocean current.

It is in this regard that Gwary (2008) posited that the negative consequences of climate change may result in 50% decline in livestock and crop production. In collaborating this assertion Food and Agriculture Organisation (FOA, 1997) had posited that agricultural production will be affected by these climate change related drivers, i.e. temperature, precipitation, sea level rise and atmospheric carbon dioxide content with attendant reduction in crop yield and agricultural productivity. Climatic conditions therefore poses a lot of scientific challenges to researchers from all over the world especially in developing countries coupled with the change in climatic conditions, which must be tackled with new ideas, reliable data and advanced instrument. Spore (2008) asserted that climate change is making crop scientist to redirect their research effort by not only trying to develop improved and high yielding varieties of crops but also developing stress-tolerant varieties to cope with the challenges posed by this phenomenon.

It therefore becomes imperative that agricultural researchers that have the responsibilities of generating innovations in agriculture are aware of the causes and effects of climate change which would assist them in meeting those challenges posed by the effects of climate change.

2. Objective of the study

The general objective of the study was to examine agricultural researchers' awareness of climate change issues in Edo State Nigeria. The specific objectives were to:

1) Describe the personal characteristics of agricultural researchers in Edo State

2) Identify the sources of information on climate change issues to the respondents.

3) Examine agricultural researchers' awareness of the causes of climate change in the study area.

4) Determine agricultural researchers' awareness of the effects of climate change in the study area.

3. Hypotheses of the study

The hypotheses of the study are stated in the null form that:

1) "There is no significant relationship between the personal characteristics of the researchers and their awareness of the effects of climate change"

2) "There is no significant relationship between the sources of information and awareness of the effects of climate change".

4. Methodology

This study was conducted in Edo State of Nigeria between June and October 2009. Edo State is an inland state in Central Southern Nigeria with its capital in Benin City. The state is bounded in the North and East by Kogi State, in the South by Delta State and in the West by Ondo State. Edo State is at an elevation of between 150m above sea level in the South and more than 550m above sea level in the North. The vegetative cover is the tropical rain forest that covers most part of the state with a land area of about 17,802 km. Some of the major cash crops produced are rubber, cocoa, and palm produce. In addition, crops such as cassava, yams, plantain, and assorted types of fruits and vegetables are also produced.

There are two public universities in the state, which are the University of Benin, Benin City (UNIBEN) and Ambrose Ali University, Ekpoma (AAU), and two agricultural research institutes, which are the Nigeria Institute for Oil palm Research (NIFOR) and Rubber Research Institute of Nigeria (RRIN). All of these institutions were used for this study. Furthermore, the faculties of Agriculture in the two universities were purposively chosen. A simple random sampling method was used to select 50% of researchers from the two faculties of Agriculture and research institutes for the study. Therefore a total of 40 researchers were sampled from NIFOR, 26 from UNIBEN, 24 from RRIN and 22 from AAU. This gave a total of 112 researchers that were sampled for this study. Data for the study were gathered through the use of a structured questionnaire that was content analysed by professionals in the field of agricultural communication.

Researcher's source of information on climate change issue was ascertained by using a four point rating scale of regularly (4 points) occasionally (3 points), rarely (2 points) and never (1 point) on a list of sources such as internet, journals, fellow researcher, newspaper/magazine, radio, and T.V. The researcher's awareness of climate change issues was ascertained by asking weather they are aware or not aware of the causes and effects of climate change. Some of the causes enumerated were gas flaring, oil spillage, deforestation, fermentation of cattle dung, and some effects of climate change enumerated were change in rainfall pattern, increased sea level, increased temperature and decrease in crop yield.

The data for this study were analyzed using descriptive statistics such as frequency counts, percentage, mean and standard deviation, while Chi-square and Pearson Product Moment Correlation were used to draw inferences.

5. Results and Discussion

5.1 Personal characteristics of respondents

The personal characteristics of the respondents are presented in Table 1. Results reveal that 82.1% of the respondents are male, while 17.9% are female. This shows that there are more male researchers than female researchers in faculties of Agriculture in the universities and agricultural research institutes in the study area. This is similar to the pattern reported by Oloruntoba and Ajayi (2006) that only 10% of university teachers in Nigeria are females. Table 1 also indicates that 45.5% of the respondents are within the age bracket of 31-40 years, which is an indication that many of the researchers are young. Also, 80.4% of the respondents are married which is expected because most of them are within the age bracket that marriage is considered important in this part of the world. Furthermore, 93.7% of the researchers are Christians which may be adduced to the fact that Christianity is the predominant religion in this part of the country. Results in Table 1 also reveal that 54.5% of the researchers are M.Sc. degree holder which may be attributed to the fact that a M.Sc. degree is a requirement

for entry into universities and research institutes. Findings further reveals that 64.2% of the researchers have between 5-10 years working experience. This indicates that most of the researchers are relatively experienced on the job and should therefore be familiar with the workings of their organization.

Furthermore, 26.8% of the respondents specialized in crop science and this may be due to the fact that most of the research institutes are crop biased.

5.2 Respondent's sources of information on climate change

Respondent's sources of information on climate change are presented in Table 2. The result shows that all the sources listed are important sources from which respondents obtain information on climate change since their means were greater than 2.50. However, the major sources as indicated by the respondents are internet ($\bar{x}$ =3.55), Television ($\bar{x}$ =3.44), Journals ($\bar{x}$ =3.22) and newspapers/magazines ($\bar{x}$ =3.30). This is not surprising because the internet is now an important means through which many enlightened individuals obtain information. Banmeke (2007) similarly reported that the internet is used for various activities among students in the Faculty of Agriculture, University of Benin, Benin City.

5.3 Respondents' awareness of the causes of climate change

Respondents' awareness of the causes of climate change presented in Table 3 indicates that 96.4% of the respondents are aware of gas flaring, 94.6% of the respondents are aware of oil spillage, 93.8% are aware of deforestation and 92.9% are aware of fossil fuel burning as some of the causes of climate change. Furthermore, 48.2% and 28.6% of the respondents noted that they are not aware of fermentation of cattle dung and inorganic fertilizer as causes of climate change respectively. This indicates that most of the respondents in the study area are quite aware of the different causes of climate change. This is expected as most of them are well educated as indicated in Table 1 and probably due to the fact that the study area is located in the Niger delta and issues around oil exploration is of major concern.

5.4 Respondents' awareness of the effects of climate change

Respondents' awareness of the effects of climate change in Table 4 indicates that 98.2% of the respondents are aware that increase in temperature is one of the effects of climate change. Also, 95.5% and 91.1% are aware of change in rainfall pattern, decrease in crop yield and increased production cost as some of the effects of climate change. This indicates a high level of awareness of the effects of climate change by the respondents of the study. This is expected because as indicated in Table 3 above that most of the respondents are aware of the causes of climate change.

5.5 Relationship between respondents' personal characteristic and their awareness of the causes and effects of climate change

Tables 5 and 6 show the relationships between respondents' personal characteristics and their awareness of the causes and effects of climate change. There are significant relationships between respondents areas of specialization and awareness of the causes ($\chi^2 = 10.50$; $p < 0.05$) and effects of climate change ($\chi^2 = 12.40$; $p < 0.05$). This result is not unexpected because respondent's area of specialization will arouse their interest in climate change issues.

5.6 Relationship between information sources and awareness of the causes and effect of climate change

The relationship between respondent's sources of information and awareness of the causes and effect of climate change is presented in Table 7. Results indicate that there is a significant relationship between information sources and awareness of causes of climate change ($r = 0.32$; $p < 0.05$). This is expected because the information sources will affect the type of information the respondents will be accessible to.

6. Conclusion and recommendations

It is obvious from the study that the important sources of information on climate change issues are internet, television and journals. Also, many of the researchers are aware of gas flaring, oil spillage and deforestation as some of the causes of climate change, the major effects of climate change the respondents are aware of are increase in temperature, change in rainfall pattern and decrease in crop yield. There is a positive and significant relationship between respondents' sources of information and awareness of the causes of climate change. From the foregoing it is therefore recommended that agricultural researcher's access to the internet be improved on as it will not only facilitate their work, but at the same time keep them abreast of happenings in the international scene. Researcher's interest in climate change issues should also be sustained by organizing workshops and seminars on the issue.

References

Ayoade, J. O. (2004). *Introduction to Climatology for the Tropics,* Spectrum books, Ibadan, pp:297.

Banmeke, T.O.A. (2007). Internet use by students in selected departments of the faculty of Agriculture, University of Benin, Benin City, Nigeria, *Journal of Agriculture, Forestry and the Social Sciences,* 5(1): 29-36.

Food and Agriculture Organisation (FAO). (1997). *Agriculture and climate change*: FAO's role on climate change and likely impact on Agricultural sector. [Online] Available: http://www.fao.org/ag/agns/fills/HLC_climatechange_and_foods_safety.pdf (February 10,2007.)

Gwary, D. (2008). *Climate change, food security and Nigeria's agriculture.* A paper presented at the ministry of agriculture. [Online] Available: http://www.guardiannews.com (July 15, 2009).

Intergovernmental panel on climate change (IPCC). (2001). Mitigation and adaptation strategies of climate change: Summary for policy makers. [Online] Available: http://www.IPCC (October 5, 2009).

Oloruntoba, A. and Ajayi, M.T. (2006). Gender and research attainment of academics in Nigerian Agricultural Universities, *Journal of Higher Education in Africa*, CODESRIA, 4(2): 83-98.

Rahimi, E. (2000). *Policies for supporting farmers*: A case study for research center for rural study. Ministry of Agriculture Abuja, pp. 215.

Spore. (2008). *Climate change*, special issue, Technical Centre for Agricultural and Rural Cooperation (CTA), Netherlands.

Table 1. Respondents' Personal Characteristics

Variable	Categories	Frequency	Percentage
Gender	Female	20	17.9
	Male	92	82.1
	Total	112	100.0
Age (Years)	20-30	18	16.1
	31-40	51	45.5
	41-50	40	35.7
	Above 50	3	2.7
	Total	112	100.0
Marital status	Single	22	19.6
	Married	90	80.4
	Total	112	100.0
Religion	Christianity	105	93.7
	Islam	7	6.3
	Total	112	100.0
Education	B.Sc.	21	18.8
	M.Sc.	61	54.5
	PhD.	23	20.5
	Others	7	6.3
	Total	112	100.0
Working experience (Years)	5-10	72	64.3
	11-15	25	22.3
	16-20	11	9.98
	>20	4	3.6
	Total	112	100.0
Areas of specialization	Crops science	30	26.8
	Agric Econs./Ext.	18	16.1
	Soil science	15	13.4
	Forestry & Wildlife	6	5.4
	Others	43	38.4
	Total	112	100.0

Source: Field Survey, 2009.

Table 2. Respondent's sources of information on climate change

Sources of information	Mean	Standard deviation
Internet	3.55*	0.682
T.V	3.44*	0.641
Journal	3.32*	0.661
Newspapers/Magazine	3.30*	0.627
Fellow researcher	3.10*	0.782
Workshop/reference	3.08*	0.761
Radio	2.98*	0.723

* Mean is more than 2.50 and therefore important. Scale: Regularly = 4 points, occasionally = 3 points, rarely = 2 points, never = 1 point

Source: Field survey, 2009

Table 3. Respondents' Awareness of the causes of climate change

Causes of climate change	**Not aware**		**Aware**	
	Frequency	Percentage	Frequency	Percentage
Gas flaring	4	3.6	108	96.4
Oil spillage	6	5.4	106	94.6
Deforestation	7	6.3	105	93.8
Fossil fuel burning	8	7.1	104	92.9
Green house gas emission	11	9.8	101	90.2
Increased population	18	16.1	94	83.9
Inorganic fertilizer	32	28.6	80	71.5
Fermentation of cattle dung	54	48.2	58	51.8

Source: Field Survey, 2009.

Table 4. Respondents' awareness of the effects of climate change

Effects of climate change	Not aware		Aware	
	Frequency	Percentage	Frequency	Percentage
Increase in temperature	2	1.8	110	98.2
Change in rainfall pattern	5	4.5	107	95.5
Decrease in crop yield	10	8.9	102	91.1
Increased production cost	9	8.1	102	91.9
Flooding	11	9.8	101	90.2
Reduced natural vegetation	11	9.8	101	90.2
Increase in seal level	13	11.6	99	88.4
Acid rain	19	17.0	93	93.0
Imbalance in soil nutrient	28	25.0	84	75.0
Increase in soil & H_20 acidity	31	27.7	81	72.3
Increase in wind	34	30.4	78	69.6
Increase in pest and diseases infestation	35	31.3	77	68.8

Source: Field Survey, 2009

Table 5. Relationship between respondents' personal characteristics and their awareness of the causes of climate change

Personal characteristics	χ^2	Degree of freedom (df)	P value	Decision
Gender	1.17	1	0.27	Not significant
Age	0.93	3	0.81	Not significant
Marital status	0.64	1	0.42	Not significant
Educational level	2.40	3	0.49	Not significant
Religion	1.95	1	0.16	Not significant
Working experience	1.87	3	0.59	Not significant
Area of specialization	10.50	4	0.03	Significant

Table 6. Relationship between respondents' personal characteristics and their awareness of the effect of climate change

Personal characteristics	χ^2	Degree of freedom (df)	P value	Decision
Gender	0.01	1	0.90	Not significant
Age	5.33	3	0.14	Not significant
Marital status	1.29	1	0.25	Not significant
Educational level	5.16	3	0.16	Not significant
Religion	0.54	1	0.46	Not significant
Working experience	4.42	3	0.21	Not significant
Areas of specialization	12.40	4	0.01	Significant

Table 7. Relationship between information sources and awareness of the causes and effect of climate change

Variables	Correlation coefficient (r)	P level	Decision
Awareness of causes of climate change	0.32	0.00	Significant
Awareness of effects of climate change	0.18	0.05	Not significant

ISSN 1916-9752 E-ISSN 1916-9760