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Utilization Evaluation of ICTs Based Climate Change Information Sourcing for Households Agricultural Adaptation Practices in the Cross River Basin, Nigeria

Emem Bassey Inyang[1*], Idongesit Michael Umoh[2] and Samuel Awolumate[3]

[1]Department of Agricultural Economics and Extension, University of Uyo, Uyo, Akwa Ibom State, Nigeria.
[2]Agricultural Science Education Unit, Department of Science, Redemption Academy, Obio Etoi, Uyo, Akwa Ibom State, Nigeria.
[3]Department of Agricultural Extension and Management, School of Science and Technology, National Open University of Nigeria, 14/16, Ahmadu Bello Way, Victoria Island, Lagos, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. Author EBI initiated the study and authors EBI, IMU and SA designed and wrote the protocol. Author IMU supervised the work. Authors EBI and IMU managed the statistical analyses of the study. Author IMU wrote the first draft of the manuscript. Authors EBI, IMU and SA managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This study evaluated the use of ICT for climate change information sourcing among secondary school students and how it Influences their household agricultural practices in Cross River Basin, Nigeria between January, 2013 and November, 2013. The survey research employed multi-stage sampling technique in the selection of the respondents. Secondary schools in the two states

**Corresponding author: E-mail: embainy@yahoo.com;*

constituting Cross River Basin (Akwa Ibom and Cross River States) were clustered into three senatorial districts in each of the state. Thereafter, simple random sampling technique was used to select both the schools and students in each of the senatorial district. Well designed Questionnaires were administered on the 200 Senior Secondary School Students selected for the study. Frequencies, percentages, independent T-test and simple regression analysis were employed to analyse the data. On the extent to which the respondents sourced for climate change information, findings indicated that 31% of the respondents lowly sourced for climate change information, 36% averagely and 33% highly sourced for climate change information. The results also revealed that the respondents mostly (71%) used textbooks, newsletters (57%), newspaper/magazines (52%) and radio/television (67%) to source for climate change information. Thirty three percent of the respondents provided low level advocacy on climate change adaptation farming practices to their households, 34% provided average level of advocacy and 33% fell into the high advocacy level. Findings from the study also revealed that female students did more advocacy on climate change adaptation farming practices to their households with a mean index of 0.6956 more than male students with a mean index of 0.6478 and the difference was statistically significant at P=.001. Extent of utilization of climate change information sources significantly influenced on the family advocacy on climate change. This study revealed that utilization of ICT to source for climate change information and students' gender in some ways influence contributions to household agricultural practices among senior secondary school agricultural science students in Cross River Basin. Students need to be strongly exposed to the usage of more information tools so as to improve their degree of climate change information sourcing.

Keywords: Farming household; agricultural practices; ICT utilization; family advocacy; climate-change; information sourcing.

1. INTRODUCTION

Behavioural changes can be considered as an outcome of effective communication process and the communication process can be intrinsically and extrinsically driven. Irrespective of the communication process source, information must be acquired by either reading or through instructions or both. Among the identified potent climate change mitigation strategies for developing regions of Sub-Sahara Africa, education is one of the veritable means to reduce intensity of the drivers of climate variability. In Nigeria, efforts to ensure food security has caused agricultural science students in secondary schools and colleges, to make effort, in compliance with the directives from their instructors/teachers, to put into practice what they have learnt in schools and colleges. This they do by advocating for adoption of climate change friendly cultural practices that lead to the production of various crops and in few cases livestock. Such cultural practices include: Selection of land, use of appropriate seed bed, selection of planting materials, adoption of appropriate technologies in the conservation of or enhancement of soil fertility (use of fertilizers, manures, lime, crop rotation etc.), adherence to good agronomic practices such as- land clearing, planting, farm hygiene, pest control, weeding and harvesting. However, levels of crop production are controlled to a large extent by natural environmental conditions, especially the climate and soil fertility status (edaphic factors). The interdependence between crops, human and edaphic factors makes it imperative for agriculturalist to have in-depth knowledge of the factors that affect crop production [1].

Climate change is any long-term change in the pattern of average weather of a specific region or the earth as a whole [2]. It is abnormal variation in the earth's climate that usually occurs over a period of time ranging from decades to millions of years. Agricultural activities are very sensitive to climate and weather conditions. An agricultural decision maker can either be at the mercy of these natural factors or try to benefit from them. Land use and management, selecting plants and breeds of animals and crop production practices such as irrigation, pests and diseases control decisions should therefore not be made without knowing climatic conditions [1]. Global concern regarding the devastating impact of climate change has emphasized the need for creating awareness and building community capacity for adaptation strategies to mitigate the effects of climate change [3,4]. In a survey conducted by Environmental Protection Agency of Ghana, the following were the main sources of climate change information were found to be newspapers, followed by television and radio.

Others included newspapers, posters and fliers among others [5].

In view of that, the key and sustainable strategy that can be used to promote effective advocacy and adaptation on climate change at the local level is the adoption of community based adaptation approach [6]. This framework provides the opportunity for rural communities most negatively affected or prone to climate change to make choices and not having them imposed from outside; enhancing the ability of the community to have a wider range of choices in the future [7]. The goal of community-based adaption approach to climate change is to build the resilience of vulnerable individuals, households, communities and societies from the ground up. The approach is anchored on local priorities because it starts with local knowledge but also seeks to integrate scientific knowledge into decision making processes. Educating, especially, the young farmers, who are the generation inheriting climate impacts, will prove very effective in adaption action.

A special population group within rural communities that require adequate attention on climate change awareness raising and advocacy comprise the children and the young in schools [6]. He further argued that the focus should of necessity be on education in schools so as to create the community understanding needed for adaptation. Building awareness among children and young adult who are often more open to change and can influence their families is likely to be a very effective process. Children also have rights in relation to the impacts of climate change: A right to be heard, a right to adaptation, a right to education. So adaptation plans should include the views and needs of children [8,9].

The Senior Secondary two agricultural science students are relatively young; this category of people ought to be active, inquisitive and willing to learn to add to their knowledge [10]. They have been exposed already to agricultural ecological issues like environmental factors affecting crop and animal production and distribution, functions and deficiency symptoms of macro and micro nutrients, factors affecting availability of nutrients in the soil, methods of replenishing lost nutrients in the soil, nitrogen, carbon, water and phosphorus cycles, irrigation and drainage etc. as part of learning programme. Both female and male students should be better informed about climatic changes and how it affects agricultural practices presently. They should be willing and ready to personally seek for information on climate change which will give them good level of familiarity with climate change issues. These students upon the acquisition of this knowledge and skills should help in the extension of innovative, climate-change-adaptation strategies and efficient farming methods to their households and communities thereby complimenting government's effort in the extension of modern and acceptable practices in farming.

There is doubt whether agricultural science students in the Cross River Basin of Nigeria do personally seek for climate change information in order to know what constitutes environmental and climate change and the best responses to these changes to guarantee environmental and climatic proof agriculture. To what extent do they use various information sources to seek climate change information? Do they communicate or apply these knowledge or information to the farming practices in their households? Thus, this paper analysed the background characteristics of the respondents, extent of Utilization of ICT sources to seek for climate change information and index of ICTs based climate change information sourcing behaviour, level of family advocacy on climate change and its index, gender contributions to households farming practices and influence of climate change information sourcing behavior on family advocacy on climate change. The findings in this study should furnish policy makers with information for formulation of policies and programmes that will promote mitigation of effect of climate change and reduce vulnerability of the agricultural production systems.

2. MATERIALS AND METHODS

The study was conducted in the Cross River Basin, Nigeria. The Cross River Basin extended to two states namely; Akwa Ibom and Cross River States. The basin extends between latitudes 4°00' and 6°50' N and longitudes 7°40' and 9°40' E. It covers an estimated area of 28,620.33 km^2 [11]. The area is characterized by undulated landscape and four main relief regions- the lowlands, the uplands, the highlands and high plateau and mountains. Well over 80% of the people in Cross River Basin are involved in the production of food and industrial crops, ornamental and medicinal plants, as well as keeping animals [12]. The study area is in the rain forest zone and has two distinct seasons viz: The rainy and the dry season [13]. The target

population of the study comprised all the Senior Secondary School 2 (SS2) Agriculture science students in the Cross River Basin, Nigeria. This set of students were chosen because they are stable, less worried about external examination and have been more exposed to the study of Agricultural science and Geography. They have been exposed to environmental sensitive topics like environmental factors affecting crop and animal production and distribution, functions and deficiency symptoms of macro and micro nutrients, factors affecting availability of nutrients in the soil, methods of replenishing lost nutrients in the soil, nitrogen, carbon, water and phosphorus cycles, irrigation and drainage etc. in Agricultural Science. In addition, most of the schools in the basin have been equipped library facilities to promote the reading culture of the students. These students surf solutions of most of their assignments from the internet using android based phones and internet cyber café, therefore, students in the region have been exposed to the use of ICT facilities due to availability of broad band services from mobile telecom providers in Nigeria. Multi-stage sampling technique was used in the selection of the respondents. Secondary schools in Cross River Basin were clustered into the three (3) senatorial districts in each of the state (Akwa Ibom & Cross River). Simple random sampling was then used to select schools from each of the senatorial districts. Thereafter, the agricultural science students were stratified into male and female gender in each school and simple random sampling was again used to select 10 boys and 10 girls from each of the schools. A total of 10 schools were visited and 200 students who offer agricultural science were selected respectively. Due consideration was given to equal representation on the basis of gender.

Questionnaire was constructed by the researchers and subjected to face and content validity by some lecturers and research fellows knowledgeable about the subject areas and revision made based on feedback. After that, the instruments were trial tested through pilot study using two schools and forty students. These schools and students were not involved in the final study. The pilot study helped in fine tuning the items in the questionnaire and enhanced the validation process. The validated questionnaire was then used in collecting data from the respondents. Utilization of Information Sources Scale (UISS) was designed to measure the extent to which the respondents utilized information communication technologies sources to seek for information on climate change agricultural adaption ptractices. It had a test-retest reliability coefficient of 0.8. Family Advocacy of Climate Change Scale (FACCS) was an inventory which measured the roles played by the respondents in communicating or encouraging the adoption of climate change adaptation strategies in their family farms during planting seasons. It had Cronbach Alpha's reliability coefficient of 0.76. The researchers went to the schools and upon introduction administered the instruments on the respondents. The instruments were administered and retrieved the same day in each school. Descriptive statistics (simple percentages and frequencies), composite index analysis, independent T-test and simple linear regression were used to analyse the data and draw inference. The composite index approach has index range that lies within 0.00 and 1.00. As the respondents estimated index of overall response tends towards 1.00, it implies that their extent of response contributions was extremely high and vice versa as it tends towards 0.00. However, for ease of analysis, the index of each respondent was distributed along a categorized level of contribution based on common intervals, such that 0.00–0.33 indicates low or poor level of contribution, 0.331–0.67 indicates average contribution level while 0.671–1.00 indicates high contribution level.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Demographic characteristics of the respondents

Table 1 presents the demographic characteristics of the respondents. It revealed that Hundred (50%) of the students were males while 50% of the students were female. Table 1 revealed that 36.0% of the respondents had family size ranging from 1–5 people per household, 54.0% had 6–10 people, 8.0% had 11–15 people while 2.0% of the respondents had household size of 16 persons and above. Thus majority (54.0%) of the students had a household size of 6–10 people with its attendance consequence on welfare. Findings on age revealed that majority (62.0%) of the respondents were between the age ranges of 16–20 years, while 38.0% of the respondents were between 10 and 15 years of age. The mean age of the respondents was found to be about 16. This It portrays that the respondents were relatively young. This category

of Student are active, inquisitive, productive and willing to acquire appropriate skills in order to live and contribute to the development of the society [10]. Ninety-four percent of the respondents accepted that their family had a farm and 96.0% of them accepted that they normally take part in the farming activities of their families.

Table 1. Frequency counts and percentages of the demographic characteristics of the Respondents

Variables	Frequency	Percentages (%)
Gender		
Male	100	50.0
Female	100	50.0
Family size		
1 – 5	72	36.0
6 – 10	108	54.0
11 – 15	16	8.0
16 and above	4	2.0
Age		
10 – 15	76	38.0
16 – 20	124	62.0
Family farm		
Yes	188	94.0
No	12	6.0
Involvement in the family farming activities		
Yes	192	96.0
No	8	4.0

Source: Field survey, 2013

3.2 Extent of Utilization of ICTs Components for Climate Change Information Sourcing among the Respondents

3.2.1 Utilization status of climate change information sources in the cross river basin

Response pattern on utilization of climate change information sources presented on Table 2 revealed that 71.0% of the respondents frequently sourced for climate change information in the textbooks, 21.0% did that rarely while 7.0% never sourced there. Eighty (40.0%) of the respondents rarely sourced in catalogues, 26.0% did that frequently while 34.0% never sourced there at all. Table 3 also indicated that 57%, 52%, 41%, 36%, 67.0 and 37.0% frequently sourced for climate change information from newsletters, newspapers/magazines, conferences/seminars, discussion with peers and others, radio/television and internet/electronic mails respectively while 26.0%, 38.0%, 35.0%, 36.0%, 23.0% and 29.0% respectively does that rarely and 17.0%, 10.0%. 24/0%. 28.0%, 10.0%, and 34.0% never sourced from these sources at all. The results also revealed that the respondents mostly used textbooks, newsletters, newspaper/magazines and radio/television in that order to source for climate change information.

3.2.2 Index of ICTs based Climate Change Information Sourcing Behaviour (ICCISB)

This subsection sought to estimate the magnitude of behaviour towards use of ICTs to seek information on issues bothering on climate change including adaptive farming practices for immediate consumption within their households during farming periods. The level of information sourcing behaviour on climate change adaptation farming practices to households among the respondents was estimated using composite index analysis. This approach was earlier highlighted in the methodology. Table 3 revealed that 31.0% of the respondents fell into the poor level of climate change information sourcing, 36.0% fell into average level while 33.0% fell into high level of climate change information sourcing. This shows that majority (69.0%) of the respondents had highly and averagely utilized information sources to source for climate change information.

3.2.3 Level of family advocacy of climate change

Table 4 portrays the relative impact of the contributions of children and young adults in the agricultural and environmental extension and education towards advancing the mitigation efforts in the less literate society. Table 4, Item 1 revealed that 42.0% of the respondents educate their parents to study the regional temperature for a particular crop/animal before planting/rearing while 10.0% did not do it at all. With respect to Item 2; “I advocate that short season crops be planted when the temperature of our area is high”, 28.0% of the respondents did that while 24.0% never did that at all. Item 3 revealed that 39.0% of the respondents reminded their parents to properly expose the farmland to sunlight radiation while 19.0% never did that. Also, Item 4 showed that majority (51.0%) of the respondents educate members of their families to always check the fertility and the pH status of the soil before planting and 10.0% of them never did that at all. Item 5 revealed that forty percent (84.0%) of the respondents suggested that appropriate seed-bed be used for the planting of various crops in their family farm(s) while 16.0% never did that.

With regards to Item 6; "I recommend to my family that the seedbeds be made perpendicular to the wind direction", 23.0% did recommend while 24.0% never recommended that to their households. Item 7 revealed that majority (59.0%) of the respondents did check to ensure that healthy/disease free seeds/livestock were selected for their family farm(s) while 8.0% never did that at all. Similarly, Item 8 upheld that majority (52.0%) of the respondents do solicit for the use of fertilizers/manures in their family farm(s) while 9.0% never solicited at all. Generally, the affirmation pattern depicts the proportion of farming families that could be climate change information friendly due to persistent sharing of climate change adaptation messages and knowledge within the households.

3.2.4 Index of Climate Change Family Advocacy (CCFA) by respondents

The level of dissemination contributions on climate change adaptation farming practices to households among the respondents was estimated using composite index analysis. Results from Table 5 showed that 33% of the respondents made low contributions on climate change adaptation farming practices to their households during farming periods, 34% made average contributions on climate change adaptation farming practices to their households and 33% made high contributions on climate change adaptation farming practices to their households during farming periods.

3.2.5 Gender contributions to household farming practices

Table 6 shows that the difference in terms of gender contributions to household farming practices among the respondents was statistically significant. The Table shows that the mean index contributions of boys is 64.780; SD = 10.322 while the mean contributions of girls is 69.560; SD = 10.148. The mean difference observed was statistically significant at $t_{(198)}$ = -3.302, P =.001. Cohen's d test was also carried out to check the power of the differences in the means of the two groups also known as the effect size, the Cohen's d was given as 0.33. This means that gender had a small effect on the contribution to climate friendly household farming practices among the students.

Table 2. Distribution of students based on extent of utilization of climate change information sources

S/N	Information sources	Frequency of use		
1.	**Libraries(libs)**	**Frequently**	**Rarely**	**Never**
A	Textbooks	142 (71.0)	42 (21.0)	14 (7.0)
B	Catalogues	52 (26.0)	80 (40.0)	68 (34.0)
C	Conference proceedings	54 (27.0)	72 (36.0)	74 (37.0)
D	Dissertations and thesis	46 (23.0)	58 (29.0)	96 (48.0)
E	Journals	64 (32.0)	66 (33.0)	70 (35.0)
F	Monograph	58 (29.0)	52 (26.0)	90 (45.0)
h	News letters	114 (57.0)	52 (26.0)	34 (17.0)
I	New papers/magazines	104 (52.0)	76 (38.0)	20 (10.0)
2	**Seminars/conferences**	82 (41.0)	70 (35.0)	48(24.0)
3	**Discussions with peer and others**	72 (36.0)	72 (36.0)	56 (28.0)
4	**ICT Tools**			
a	CD Rom literature search	68 (34.0)	74 (37.0)	58 (29.0)
b	Radio/Television	134 (67.0)	46 (23.0)	20 (10.0)
c	Internet/electronic mails	74 (37.0)	58 (29.0)	68 (34.0)

Source: Field survey, 2013

Table 3. Distribution of respondents based on level of ICTs based Climate Change Information Sourcing Behaviour (ICCISB)

Index range of ICCISB	ICCISB index interpretation	Respondents	Percentages (%)
0.00 – 0.33	Poor	66	33
0.331-0.67	Average	72	36
0.671-1.00	High	66	33

Source: Computed from field survey, 2013

Table 4. Distribution of respondents based on their family advocacy on climate change

	Family advocacy of climate change	AL	ST	RL	NV
1	I educate my parents to study the regional temperature for a particular crop/animal before planting/rearing?	42.0	33.0	15.0	10.0
2	I advocate that short season crops be planted when the temperature of our area is high	28.0	30.0	18.0	24.0
3	I remind my parents to properly expose the farmland to sunlight radiation	39.0	23.0	19.0	19.0
4	I educate members of my family to always check the fertility and the PH status of the soil before planting	51.0	24.0	15.0	10.0
5	I do suggest that appropriate seed-bed be used for the planting of various crops in our family farm(s).	40.0	26.0	18.0	16.0
6	I recommend to my family that the seed-beds be made perpendicular to the wind direction	23.0	28.0	25.0	24.0
7	I always check to ensure that healthy/disease-free seeds/livestock are selected for our family farm(s)	59.0	17.0	16.0	8.0
8	I do solicit for the use of fertilizers/manures in our family farm(s)	52.0	26.0	13.0	9.0
9	I do solicit for the application of lime in our family farms to reduce soil acidity	34.0	31.0	19.0	16.0
10	We do plant our family farm(s) on time to optimize water use from rainfalls	48.0	21.0	21.0	10.0
11	We ensure regular weeding and pest control in our family farm(s) through my initiatives	58.0	27.0	7.0	8.0
12	I recommend/ensure the planting of different types of crops in a plot for diversity purpose	30.0	32.0	20.0	18.0
13	I do ensure the planting of mixed varieties of a particular crop in a plot in each planting season	43.0	26.0	22.0	9.0
14	I ensure the practice of crop rotation in our family farm(s)	49.0	27.0	11.0	13.0
15	I ensure the application of cover crops to our family farm(s)	42.0	20.0	22.0	16.0
16	I ensure that my family makes compost for our farms	53.0	25.0	15.0	7.0
17	I ensure planting of crops under shade tree cover in our family farm(s)	23.0	22.0	20.0	35.0
18	I do ensure terracing practice in our family farm(s)	27.0	21.0	25.0	27.0
19	I discourage continuous tillage on our family farm(s)	36.0	24.0	16.0	24.0
20	I carry out mulching on seedbeds in our family farm(s)	41.0	25.0	17.0	17.0
21	I ensure the use of drought-resistant crops/livestock on our family farms when the season is drier	40.0	27.0	17.0	16.0
22	I strongly ensure the making of water ways to channel runoff water when there is prolonged rain	41.0	23.0	20.0	16.0
23	I ensure the making of bunds to halt soil erosion and runoff when there is prolonged rain	48.0	27.0	15.0	10.0

Source: Field survey, 2013, AL = Always, ST = Sometimes, RL = Rarely, NV = Never, Note: Numbers are in percentages, n=200 respondents

3.2.6 Influence of climate change information sourcing behaviours on family advocacy on climate change

Table 7a showed that the independent variable significantly influenced the variation in the climate change adaptation farming practices advocated by the respondents to their household agricultural practices, r = 0.255. It indicated that 65% (adjusted R^2 = 0.60) variance in climate change adaptation farming practices advocated by the respondents to their household agricultural practices was accounted for by extent of climate change information sourcing. The influence of this independent variable on family advocacy on climate change of the students was also significant $F_{(1,198)} = 13.725$; $P < 0.05$.

A review of the beta weights in Table 7b indicated that the extent of climate change information sourcing bahaviour, $\beta = 0.255$, $t_{(198)} = 3.705$, P = .000, significantly contributed to the model. This indicates that extent of climate change information sourcing is a strong predictor of family advocacy on climate change among the students.

3.3 Discussion

The result of the study showed that the sampled students utilized various tools to source for information about climate change. Hence, there is need to strongly expose the students to the usage of more information sources/tools so as to improve their degree of climate change information sourcing. The findings also revealed that the respondents' most used sources for climate change information were textbooks, newsletters, newspaper/magazines and radio/television. This corroborates with the findings of that found that the main sources of climate change information were newspapers, followed by television and radio [5].

Strengthening the livelihoods of rural populations is intrinsically linked to poverty reduction efforts and is a key area to focus climate change adaptation strategies in the agriculture sector. This system is implemented using basic and locally available inputs, such as family labour, native livestock breeds and plant species, and organic fertilizer. It is incredible that a good number of students sampled for this study still fell under low level of contribution to climate change adaptation farming strategies in their family farms. This is a sharp departure from the aims and objectives of the training they are receiving at various levels of schooling. Students who are in the post primary education stage were taught in the classroom about modern methods of farming with practical training on the school [14]. The aim ideally was to educate and make the young generation to be conversant with agriculture in order to encourage them to contribute to food production and distribution in the country.

Students upon the acquisition of this knowledge and skills should help in the extension of innovative and efficient farming methods to their households and communities thereby complimenting government efforts in the extension of modern and acceptable practices in farming. To corroborate the above views, the future of increased food production rests on giving support to the education and training of young generations who are students of agriculture [15]. Interestingly, the study also found that a good number of the respondents highly contribute to climate friendly agricultural/farming practices in their family farms. These set of students should be exposed to more education and training for them to do more.

Table 5. Distribution of Respondents based on Index of Climate Change Family Advocacy (CCFA)

Index range of CCFA	Index of CCFA interpretation	Respondents	Percentages (%)
0.00 – 0.33	Low	66	33
0.331-0.67	Average	68	34
0.671-1.00	High	66	33

Source: Field survey, 2013

Table 6. Analysis on of gender contributions to household farming practices

Gender	N	Mean Index	SD	Df	t-value	Sig
Male	100	0.6478	10.322	198	-3.302	.001*
Female	100	0.6956	10.148			

*Source: Field survey, 2013. *Significant at P =*.001

Table 7a. Simple regression summaries showing the influence of climate change information sourcing behaviour on family advocacy on climate change among respondents

Model	Sum of square	Df	Mean square	f-value	Sig
Regression	1418.871	1	1418.871	13.725	.000*
Residual	20469.349	198	103.381		
Total	21888.220	199			
Std Error of the Estimate = 10.167					
R = 0.255					
R^2 = 0.65					
Adj R^2= 0.60					

*Source: Field survey, 2013. *Significant at P=.000*

Table 7b. Regression coefficient of independent variable on family advocacy on climate change among students

Model	B	Unstandardized coefficient	Standardized coefficient	t-value	Sig	Remark
		Standard error	Beta			
Constant	52.430	4.043		12.967	0.000	*
Extent of information sourcing behaviour	0.531	0.143	0.255	3.705	0.000	*

*Source: Field survey, 2013. *Significant at P=0.00*

The findings of the study with respect to contributions to household farming practices among students by gender indicated that girls advocated more than the boys. This agrees with the position of FAO and some other authors [16-18] that although rural women and men play complementary roles in guaranteeing food security, women tend to play a greater role in natural resource management and ensuring nutrition. Women often grow process, manage and market food and other natural resources, and are responsible for raising small livestock, managing vegetable gardens and collecting fuel and water [18]. Findings in this study indicated that girls in the study area are already making efforts to cope with changes in the climatic condition with respect to agricultural production. This could be attributed to the fact that the study area is characterized by a state of economy in which women are active and in some families bear the primary responsibility of feeding their homesteads and are mostly accompanied by their daughters. Therefore, the girls ought to be active and productive like their mothers.

This finding is supported by recent evidence which demonstrated that women who are already experiencing the effects of weather-related hazards – such as flooding and extended periods of drought – are developing effective coping strategies, which include adapting their farming practices [19,20]. A recent participatory research project by Action Aid and IDS clearly showed that women in rural communities in the Ganga river basin in Bangladesh, India and Nepal are adapting their practices in order to secure their livelihoods in the face of changes in the frequency, intensity and duration of floods [19]. The women who took part in the research described various adaptation strategies such as changing cultivation to flood and drought resistant crops, or to crops that can be harvested before the flood season, or varieties of rice that will grow high enough to remain above the water when the floods come. The women were also clear about what they needed in order to adapt to the floods: Crop diversification and agricultural practices, skills and knowledge training to learn about flood and drought-resistant crops and the proper use of manure, pesticides and irrigation.

The study also revealed that the more frequent the students sourced for climate change information, the more they contributed to climate change adaptation agricultural practices. Climate change awareness involves creating knowledge, understanding and values, attitude, skills and abilities among individuals and social groups towards the issues of climate change for attaining a better quality environment. Climate change specialists have repeatedly pointed out that a solution to climate change problem will require climate change awareness and its proper understanding. Hence, if agricultural science students (future farmers) do not seek information about changes in climatic conditions and how best to respond to these changes to guarantee climatic-proof agriculture, to develop farming strategies that adapt to climate change might be difficult.

4. CONCLUSION

Degree of climate change information sourcing and the gender of the respondents were found to significantly and statistically influence the family advocacy of climate change of the students. Therefore, the more agricultural students, especially female students, know or read about climate change, the more effort they will make in contributing to climate change adaptation farming practices in their various household farms. However, it is logical to conclude in this study that climate change information sourcing and gender in some ways contribute to family advocacy on climate change among the agricultural science students in the Cross River Basin Region of Nigeria, Africa.

5. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

Research institutions and government agencies should exert much effort in encouraging the inclusion of climate change issues in the secondary school curriculum so as to raise the knowledge level of the students on climate.

Information communication technology literacy programmes in secondary schools should be intensely implemented and students need to be strongly exposed to the usage of more information tools so as to improve their degree of climate change information sourcing.

Practical agricultural programmes in schools should be promoted and sustained so as to expose the students to modern and acceptable ways of farming and students should also be encourage by their teachers to always extend their knowledge in practical agriculture to their immediate community members especially their households.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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