

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

5,300

Open access books available

130,000

International authors and editors

155M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Chapter

Effects of Demographic Characteristics for Farmers' to Climate Change in Bunkure, Nigeria

Salisu Lawal Halliru, Abubakar Abdullahi Bichi and Aliyu Shu'aibu Muhammad

Abstract

This study examine the effects of demographic characteristics on farmers' level of awareness to climate change in Bunkure, Nigeria. The study hypothesized that, there is no significant relationship between farmers' demographic characteristics and level of awareness to climate change. Survey design approach was adopted using primary data source. A total of three hundred and fourty-seven (347) farmers were selected purposively. The data collected was analyzed using descriptive statistic and ANOVA. The study revealed that majority of the farmers in the area are males that fall within the active age bracket due. However, the study concluded that the greater the size of the household the greater the chances of being engaged in farming and more aware on climate change effects. It was revealed that those that attend tertiary education do not participate in farming activities. Also large number of the respondents were aware that climate is changing through the educative programmes of mass media. The study recommended that, adequate support should be given to female to participate in all agricultural activities. Educated persons should be encourage to participate more on agriculture. More emphasis on dissemination of climate change issues on adaptation strategies through the mass media is also highly needed.

Keywords: demographic, farmers, climate change

1. Introduction

The issue of climate change today has become one of the major challenges that humanity faces in the 21st century due to its significant effects on socio-economic and political stability in different geographical location. The Intergovernmental Panel on Climate Change (IPCC) [1], views climate change as statistically significant variation in either mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). This change may be due to natural processes or persistent anthropogenic activities over the different component of the ecosystem. Although extreme violent weather has occurred throughout the human history, but the recent upsurge in climate related hazards call for the confirmation of the argument for global warming and climate change as results of observed

increasing in temperature that makes some areas to experiencing extreme weather conditions [2–7].

The on-going climate change and its associated global warming are expected to cause distinctive climate variability in different zones, which will impact negatively on the ecosystem and agriculture [8, 9]. That is the reason why, it is good for the people to acquire knowledge of weather and climate and their implications on environmental resources including agriculture for the betterment ecosystem and humanity. In fact the impact of climate change is felt worldwide with varying degree as a result of differences in underlying factors that triggered the change. In Nigeria for instance, the severity of the impact is felt by the majority of people whose livelihoods are more defended on agriculture due to its highly depended on weather and climate. Also agriculture in Nigeria is a major user of land resources as it account for about 1.4 billion hectares of land for crop cultivation and an additional 2.5 billion hectares are used for pasture [10]. With this development, one can say that Climate plays an important role in the living and livelihood of man because his agricultural activities are so much defended on the nature and variability of the Climate.

As Man begin to witness reduction in agricultural production he assumed to be exacerbated by climate change and related events [11]. This scenario makes local farmers to be no longer able to predict onset and cessation of rain, based on past experiences due to their low level of socio-economic status. These lead local farmers with low socio-economic status to plant too early without receiving update on the weather forecast. Hence, it was believed that wealthier farmers benefit more from the daily, week, monthly and seasonal information of weather and climate than the poor subsistence farmers who are the most vulnerable most to challenges of climate change. This problem and other related call the attention of the United Nations Task Team on Social Dimensions of Climate Change to discuss and ensure that the social dimensions of climate change are adequately reflected in global agendas in order to builds on the principles of equity and social justice, especially for the most vulnerable people.

Several attempts have been made by scientists to study the effect of climate change on agricultural productivity and farmers' adaptation in different parts of Nigeria [12]. But information on the effects of farmers' demographic characteristics as determinant factor influencing their level of awareness on climate change in Kano state and Bunkure Local government Area has been limited.

Bunkure local government area is an agrarian rural areas of Kano where most of its inhabitant depend on farming as their main source of livelihood. This trend makes them to be most prone to the effects of climate change and its variability. Therefore is there need to understand the effects of social dimension of the farmers' awareness on climate change and their sources of information to climate change. Understanding this knowledge may greatly help in developing measures and effective monitoring, adaptation and mitigation measures to climate change in the study area and any climate harzard prone areas.

It is against this background that this study was conducted to assess the effects of socio-economic characteristics on farmers' level of awareness to climate change in Bunkure Local Government area of Kano State, Nigeria that will help to mitigate the effects of climate change.

2. Material and methods

2.1 The study area

Bunkure Local Government Area is about 50 km south from the ancient city of Kano located between Latitude $11^{\circ}34' 02''\text{N}$ to Latitude $11^{\circ}46' 05''\text{N}$ of the Equator

and between Longitude $8^{\circ}26' 36''$ E to Longitude $8^{\circ}46' 43''$ E of the Prime Meridian. The study area is comprises of fifteen wards [13] with an aerial extend of 487Km^2 with a population of 170,891 inhabitants [14]. It bordered with Dawakin kudu and Kura LGAs by the North, Wudil and Garko LGA by the East while Kibiya at the South Western part of the study area (see **Figure 1**). The climate of the study area is the reincarnation of the climate of Kano which is the tropical dry-and-wet with the movement of the Inter-Tropical Discontinuity (ITD) gives rise not only the two seasons (wet and dry seasons) but four distinct seasons, *Rani*, *Damina*, *Kaka* and *Bazara* [13, 15].

The wet season lasts from May to mid-October with a peak in August while the dry season extends from mid-October of one calendar-year to mid-May of the next. The mean annual rainfall is between 800 mm and 900 mm; and variations about the mean annual values are up to $\pm 30\%$. The mean annual temperature is about 26°C [15].

2.2 Methodology

This study adopts survey design approach using primary data in the area in order to assess the effects of socio-economic characteristics on farmers' level of awareness to climate change which in the end will help to mitigate the effects of climate change. The primary data were obtained through questionnaires. The data obtained include information on farmers' socio-economic characteristics, knowledge about climate change and sources of climate change information.

Based on the population figure of the study area, a total of three hundred and eighty-two (382) farmers were selected using the Krejcie and Morgan's [16] method of determining sample size. But after retrieval of the questionnaires only three hundred and forty-seven (347) was retrieved and the analysis was based on the three hundred and forty-seven (347). Purposive sampling technique was used for the purpose of selecting respondents. This method is characterized by the use of personal judgment and a deliberate attempt to obtain representative sample

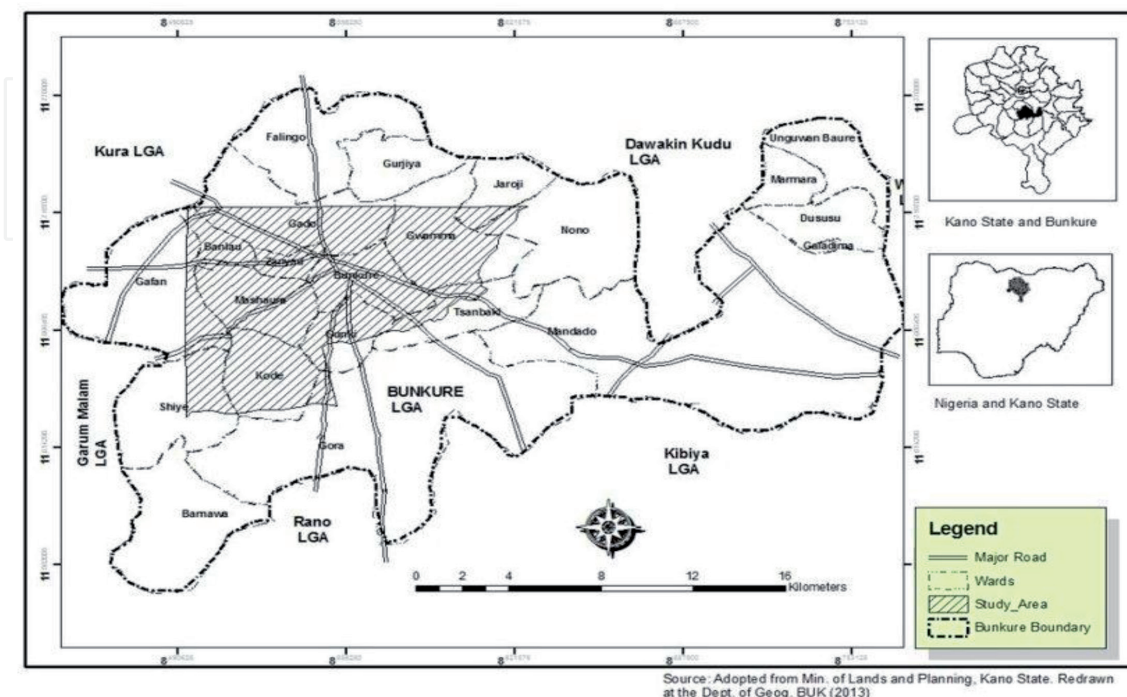


Figure 1.
Map of the study area.

by including presumable typical areas or groups in the sample [17]. Due to non-availability of population figures at ward level in the 1991 and 2006 census results, the copies of questionnaire were distributed uniformly among the ten [10] wards in the local government area. Each ward had 38 copies of questionnaire except for Bunkure ward which had an addition of 2 making 40 copies of questionnaire being the most populated ward as the local government headquarters.

The data collected was subjected to simple descriptive statistics and tables, percentages and bar graphs was used to present the data in order to analyze the effects of socio-economic characteristics of respondents in relation to their awareness to climate change.

3. Results and discussion

3.1 Socioeconomic characteristics of respondents

3.1.1 Age of respondents

As indicated in **Table 1** majority (79.3%) of the sampled farmers are within the active age bracket of 31–50 years. This results suggest that, the farmers were still in their active/productive age and as such they can understand and experience the effects of climate change and adaptive strategies. The modal age bracket or group of farmers between 21–50 years according to [18] are considered to be active/productive age in farming activities. Participation of youth in agriculture in Nigeria is due to the high level of agricultural apathy by the youth as suggested in the studies on youths' participation in agriculture in Nigeria conducted by [19, 20]. This result corroborated the findings of [21] on adaptation strategies to climate change among grain farmers in Goronyo LGA of Sokoto State which showed that people within the age bracket of 31–50 years are active in farming activities in the area.

3.1.2 Gender of respondents

Gender issues in climate change have recently become important because of the social, spatial and economic contexts within which the change is perceived and responded by gender. The gender distribution of the respondents as shown in **Figure 2** indicated that 95% of the respondents are males while, female's farmers constituted only 5%. The result shows that majority of the farmers are males in

Age Group (Years)	Frequency	Percentage
18–30	42	12.10
31–40	120	34.6
41–50	155	44.7
51–60	20	5.8
>60	10	2.8
Total	347	100

Source: Field Survey (2019)

Table 1.
Age of respondents.

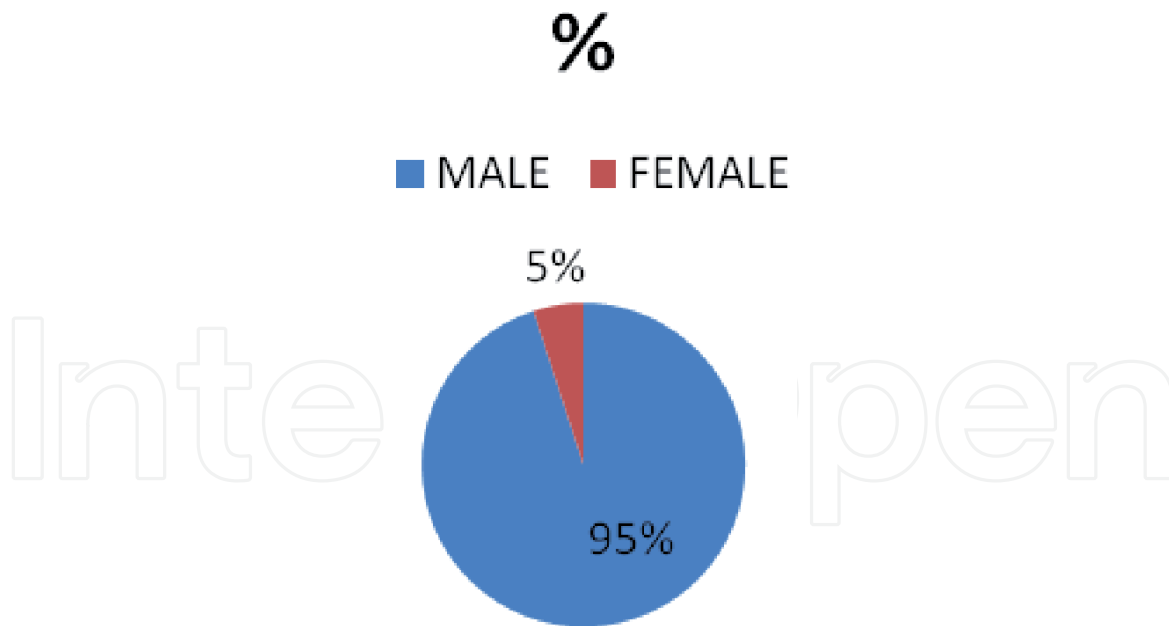


Figure 2.
 Distribution of Respondent's gender. Source: Field survey (2019).

the area and this has connection with the culture of the people in Kano where male engaged in all activities including agriculture in order to provide food for their families. This is in agreement with other related studies by [22, 23], that the agricultural sector and the tedious activities related to climate change adaptation strategies are dominated by males. On the other hand, the study contradict the findings of [24] on farmer's perception on the effect of climate change and variation on urban agriculture in Ibadan Metropolis, South-western Nigeria were 66.9% of their respondents were females while 33.1% were males.

3.1.3 Household size

The size of household as indicated in the **Table 2** shows that less than half (45%) of the respondents had a household size of between 6–10 persons while households with 11–15 persons constituted (33%). This implies that on the average, a typical household size is about 11 persons. This indicated that the greater the size of the household the greater the chances of being engaged in farming and more awareness on climate change effects.

Household size	Frequency	Percentage
<5	13	3.8
6–10	157	45.2
11–15	113	32.6
16–20	44	12.7
>20	20	5.8
Total	347	100

Source: Field Survey (2019)

Table 2.
 Household size.

LEVEL OF EDUCATION

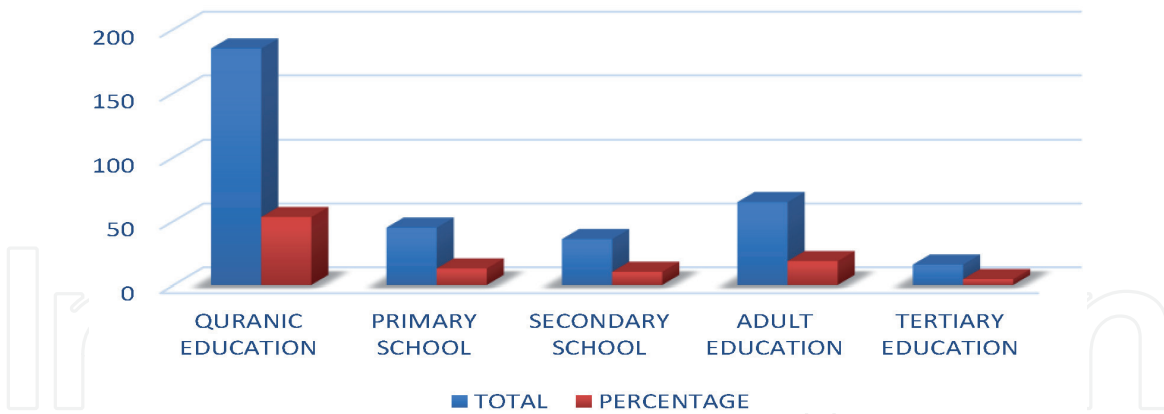


Figure 3. Level of education of the respondents. Source: Field survey (2019).

3.1.4 Educational attainment of respondent

The results in **Figure 3** revealed that majority of the total respondents (53.31%) had Quranic education as their highest education attainment while a few (4.61%) had tertiary education. In the study conducted by [18] on the Perceptions on climate change and adaptation strategies among sweet potato farming households in Kwara State, North central Nigeria found that just about 2% of the respondents had tertiary education. This indicated that those that attend tertiary education do not participate in farming activities due to the preference for white collar jobs, especially in developing countries like Nigeria [20, 25]. The result in **Figure 3** further indicated that the entire sampled respondents in the study area had one type of education or the other which could enhances their reasoning in all aspect of life.

3.2 Farmers awareness of climate change

3.2.1 Awareness of climate change

From the findings of the study it was revealed in **Table 3** that a large number of the respondents (82%) were aware that climate is changing. Though, the result is higher but lower than the findings of [21] where 98% of the sampled farmers claimed that they are aware of climate change. This difference occurred as a result of differences of their level of educational attainment, culture and socio-economic characteristics. This is because according to [26] in their studies on determinants of farmers’ adaptation to climate change in Ghana showed that education was positive and significantly related to farmers’ decision to adapt to climate change.

Level of Awareness	Total	Percentage (%)
Yes	284.54	82
No	62.46	18
Total	347	100

Source: Field Survey (2019).

Table 3. Level of awareness of climate change.

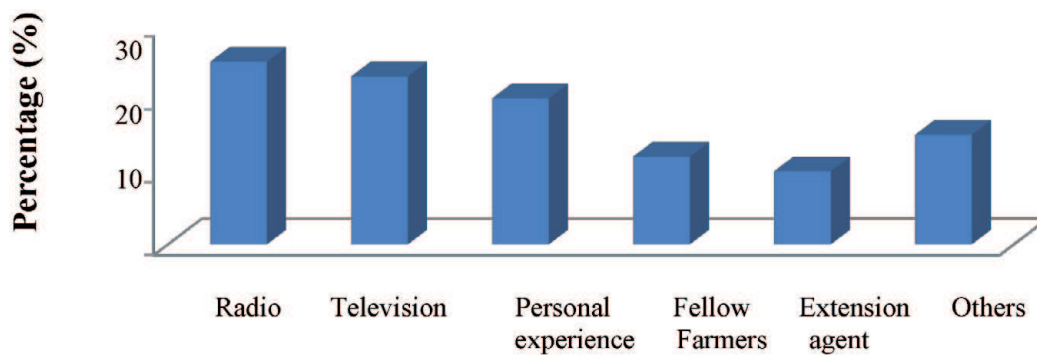


Figure 4. Source of awareness on climate change. Source: Field survey (2019).

3.2.2 Sources of information on climate change

The results in **Figure 4** shows that farmers access information on climate change from different sources. The figure revealed that mass media were the major sources of awareness for majority of the respondents as 24.5% got their awareness on climate change from the radio; 22.8% from the television. A little over 20% of the respondents claimed that, their awareness of climate change was by their personal experiences. Also extension agents in the study area shows little concern on informing farmers on the incidence of climate change but rather the media plays a significant role in educating not only farmers but the general public through their programmes of daily weather forecast report and other scientific news and programmes. Because today, mass media plays vital role in translating sciences that shaped peoples' perceptions on various issues related to environment, technology and risk. This makes many people to pay much attention to the science based news which in turn affect their positive knowledge about climate change [27].

4. Conclusion

The study provides an insight on the effects of farmers' demographic characteristics to climate change in Bunkure, Nigeria. The study revealed that majority of the sampled farmers in the study area are males that fall within the active age bracket and can understand and experience the effects of climate change due to their active participation in agricultural activities.

As gender issues in climate change become important issues globally the result of the study shows that majority of the farmers are males in the area and this has connection with the culture of the people in Kano where male engaged in all activities including agriculture in order to provide food for their families.

However, the study concluded that the greater the size of the household the greater the chances of being engaged in farming and more aware on climate change effects.

From the results on the level of farmers' education it was revealed that those that attend tertiary education do not participate in farming activities due to the preference for white collar jobs. Also it was established that all the respondents in the study area had one type of education or the other which could enhances their reasoning in all aspect of life.

From the findings of the study it was revealed that a large number of the respondents were aware that climate is changing. Mass media such as radio, television through their programmes of daily weather forecast report and other scientific news and programmes are the major sources of farmers' information to climate

change for majority of the respondents. A little of the respondents claimed that, their awareness of climate change was by their personal experiences. Surprisingly, extension agents who are saddled with the responsibilities of educating farmers in their palaces of assignment particularly in the study area shows little concern on informing farmers on the incidence of climate change.

5. Recommendations

Following the findings and conclusions made from the study, the following recommendations were made:

There is a need for the government and Non-governmental organization to support the participation of female in all agricultural activities through establishment of female farmers' cooperative group or society. By so doing, it will go a long way in improving their standard of living.

Educated persons should be encourage to participate more on agriculture through giving loan and other incentives to under the activities. This will help in improve their standard instead to wait for white collar job which has no time to come.

More emphasis on dissemination of climate change issues through the mass media is highly needed through public-private partnership on adaptation strategies to reduce factors that aggravate climate change and as well as showcase successful adaptation techniques adopted elsewhere that have local relevance.

Also there is need for the government to motivate extension agents to continue discharging their public responsibilities in order to improved farmer education for effective agricultural activities and adaptation strategies on the changing climate.

There is need for public-private partnership to provide financial support to farmers in order to increase their ability to adopt various management strategies in response to climate change.

Author details


Salisu Lawal Halliru^{1*}, Abubakar Abdullahi Bichi² and Aliyu Shu'aibu Muhammad¹

¹ Department of Geography, Federal College of Education, Kano, Nigeria

² Department of Geography, Federal University, Gusau, Nigeria

*Address all correspondence to: lhsalisu09@gmail.com

IntechOpen

© 2021 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [IPCC]: Climate Change 2007 Geneva, Switzerland: IPCC
- [2] Mcquire B, Mason I, Kilburn C. Natural Hazards and Environmental Change: London: Arnold, 53-63 p
- [3] Olaniran, O. J. Rainfall Anomalies in Nigeria: The Contemporary Understanding: The Fifty-Fifth Inaugural Lecture of the University of Ilorin.
- [4] Odjugo P.A.O & Ikhuoria A. I. The impact of climate change and anthropogenic factors on desertification in the semi-arid region of Nigeria: Global Journal of Environmental Science, 2[2]: 118-126.
- [5] Ayoade, J.O. Climate change: A Synopsis of Its Nature, Causes, Effects and Management: Ibadan: Vantage Publishers, PP. 5-6.
- [6] Odjugo P.A.O. An analysis of rainfall pattern in Nigeria: Global Journal of Environmental Science, 4(2): 139-145 p
- [7] Nwafor, J. C. Environmental Impact Assessment for Sustainable Development: The Nigerian perspective. Enugu: EL 'DEMAK pubs, Pp. 359-394 p
- [8] Mshelia A.D. Adaptation strategies to climate change: Journal of Energy and Environment, 18 (3): 74-81 p.
- [9] Climate change impact on plant species composition in six semi-arid rangelands of Northern Nigeria: Nigerian Geographical Journal 5[1]: 35-42 p
- [10] Anyoha, N. O., Nnadi, F. N., Chikaire, J., Echetama, J. A., Utazi, C. O., & Ihenacho, R. A. Socio-economic factors influencing climate change adaptation among crop farmers in Umuahia South Area of Abia state, Nigeria: Net Journal of Agricultural Science, 1[2], 42-47 p
- [11] Nwajiuba C, editor. Climate change and adaptation in Nigeria: Margraf, Weikersheim, 65-72 p
- [12] Sofoluwe, N. A., Tijani, A. A. and Baruwa, O.I. Farmers Perception and Adaptation to Climate Change in Osun State Nigeria: African Journal of Agricultural Research. Vol. 6 [20]. Pp. 4789-4794 p
- [13] Tanko and Momale, editors. Weather and Climate: Kano environment, society and development. 2014. 13-19 p. United Kingdom: Adonis & Abbey Publishers Ltd
- [14] Census: National Population Commission
- [15] E. A. Olofin, Nabegu and Dambazau, editors. The Physical Setting: Wudil within Kano Region. A Geographical Synthesis. 2008. 5-34 p. Kano: Adamu Joji.
- [16] Krejcie, R. V., & Morgan, D. W. Determining sample size for research activities in educational psychological measurement: Journal of Education and Psychology, 1970 30, 607-610 p
- [17] Abiola, O. Procedures in Educational Research, Kaduna: Kingon Nigeria Limited.
- [18] Falola, A and Achem, B. A. Perceptions on climate change and adaptation strategies among sweet potato farming households in Kwara State, North central Nigeria: Ceylon Journal of Science 46 (3): 55-63 p
- [19] Adekunle, O.A., Adefalu, L.L., Oladipo, F.O., Adisa, R.S., and Fatoye,

A.D. Constraints to youth's involvement in agricultural production in Kwara State, Nigeria: *Journal of Agricultural Extension*, 13[1]:102-108 p

[20] Falola, A., Ayinde, O.E., and Ojehomon, V.E. T. Economic analysis of rice production among the youths in Kwara State, Nigeria: *Albanian Journal of Agricultural Sciences*, 12 [3]:503-510 p

[21] Ikpe, E. Unpublished Master's thesis Adaptation strategies to climate change among grain farmers in Goronyo Local Government Area of Sokoto state. Department of Geography, Ahmadu Bello University, Zaria.

[22] Ishaya, S., & Abaje, I. B. Indigenous people's perception on climate change and adaptation strategies in Jema'a Local Government Area of Kaduna State, Nigeria: *Journal of Geography and Regional Planning*, 1[8], 138-143 p

[23] Abraham, F., Bamidele, F. S., Adebola, A. J., & Kobe, I. H. Climate change mitigating activities and determinants in the rural guinea savannah of Nigeria: *Sustainable Agriculture Research*, 1 [2], 170-177 p

[24] Odewumi, S.G., Awoyemi, O. K., Iwara, A.I. and Ogundele, F.O. Farmer's perception on the effect of climate change and variation on urban agriculture in Ibadan Metropolis, South-western Nigeria: *Journal of Geography and Regional Planning*. Vol. 6 [6], 209-217 p

[25] Muhammad-Lawal, A., Omotesho, O.A., and Falola, A. Technical efficiency of youth participation in agriculture: A case study of the Youth-in-Agriculture Programme in Ondo State, Southwestern Nigeria: *Nigerian Journal of Agriculture, Food and Environment*, 5[1]:20-26 p

[26] Francis, N. & Tsunemi W. Determinants of farmers' adaptation to

climate change: A micro level analysis in Ghana: *Scientia Agricola*. Vol 73, N.3, 201-208 p

[27] Zhao, X., Leiserowitz, A.A., Maibach, E.W. and Roser-Renouf, C. Attention to science/ environment news positively predicts and attention to political news negatively predicts global warming risk perceptions and policy support: *Journal of Communication*, 61(4):713-731 p