



# AWARENESS AND PERCEPTIONS OF CLIMATE CHANGE AMONG EXTENSION WORKERS OF AGRICULTURAL DEVELOPMENT PROGRAMME (ADP) IN PART OF NIGER STATE

## ABSTRACT

Given the devastating effects of climate change on agriculture, it is pertinent to determine the level of awareness and perception of climate change among extension workers of the Agricultural Development Programme (ADP) in Niger State. Therefore, the aim of this paper is to determine the level of awareness and perception of climate change among extension workers of the Agricultural Development Programme (ADP) in part of Niger State. The paper used both primary and secondary data. The methods of data analysis used include both qualitative and quantitative data analysis methods.

**HASSAN, IBRAHIM ALHAJI; & DR. T. I. YAHAYA**

Department of Geography, Federal University of Technology Minna, Niger State, Nigeria.

## Introduction

Agricultural production greatly depends on climate elements such as rainfall and temperature. Evidence from studies shows the increasing impacts of recurrent inconsistencies of climate variables on agricultural production (Nkomwa *et al.*, 2014). Due to climatic inconsistencies, the global environment could be continually subjected to storms, floods, droughts, and other climate change threats with intense impacts on agricultural yields. However, extreme weather events could cause increased heat stress to crops and livestock, fire outbreaks, which threatens to graze, and livestock rearing, loss of suitable land for production and reduced length of growing seasons (Madzwamuse, 2016). Other implications on agricultural production include problems related to evaporation and absorption of nutrients; shortage or excessive soil moisture which can damage the realization of crop-yield potential (Eitzinger *et al.*, 2010). High temperatures coupled with wet conditions create conducive environments for the breeding and growth of pests and pathogenic organisms thereby increasing incidences of pests and diseases on crops, livestock and poultry (Terdoo *et al.*, 2014).

Climate change is a global problem and its impact is made visible especially in the agricultural sector where it has significantly affected production in most developing countries (Elum *et al.*, 2017). This has made citizens of most African countries highly vulnerable to food insecurity. Agriculture is one of the most important sectors that contribute immensely to the economies of most African countries including Nigeria where it constitutes about 40% of the countries' Gross Domestic Product (GDP) and about 70% of the populace depends on it as a source of their livelihood (Ola, 2019).



The Data analysis was analysed utilizing SPSS 22.0. The study shows that conference source ranked the highest with 255 sampled population affirming it, radio source ranked second with 252 sampled population affirming it while cell phone ranked the least with 9 sampled population affirming it. This shows that the major source of climate change information for ADP workers was conference organized by both the government and non governmental organizations. The study also revealed that the major perceived cause of climate change is cutting down of trees. The study also shows that reduced crop yield was the major perceived effect of climate change in the study area which is a factor of decrease soil fertility and increased crop pests and diseases in the study area. The paper concludes that agricultural extension agents in Niger State are aware of climate change but lack sufficient knowledge about it, and thus require training on a variety of climate change-related topics, most notably basic climate change concepts, the use of cultural practices to mitigate and adapt to climate impacts, and environmentally friendly management practices to reduce climate change impact within the study area.

**Keywords:** Awareness, Perception, Climate Change, Agricultural Development Programme and Extension Workers

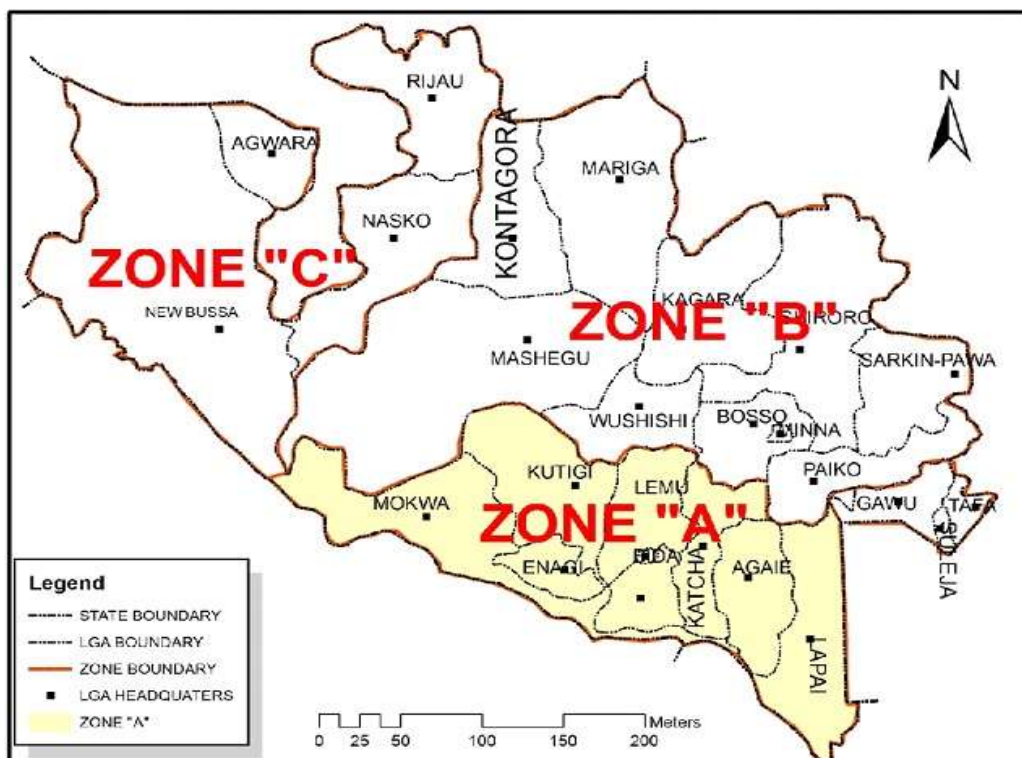
Over the years, several agricultural programmes have been introduced to reduce abject poverty among rural dwellers, mostly farmers, sub-Saharan African. Some of these programmes include among others, the United Nations Development Programme (UNDP), Food and Agricultural Organization (FAO), The Directorate of Food, Roads and Rural Infrastructure (DIFRRI), Green Revolution (RV), Operation Feed the Nation (OFN) and Agricultural Development Programme (ADP) (Abdulhamid, 2015).

ADP is one of the structural platforms established by the Federal Government of Nigeria in the year 1963 after independence to support the State Government efforts in the development of agricultural projects; the main aim of this programme was to increase the production of agricultural products in Nigeria and to increase the income of most farmers that operates on a small scale through the provision of assistance such as giving them fertilizers, improved seed for a good harvest; this programme has to be of great importance to both the small and medium-scale farmers in Nigeria (Ajayi and Ajala, (2017). There are noticeable consequences of climate change in Nigeria such as intense thunderstorms, widespread floods and incessant droughts. Odey (2009) points out that climate change impacts pose great dangers with consequences such as desertification, sea-level rise, flooding, water salinization, among others. Additional impacts include threats to health as rising temperature could bring about diseases such as chronic heat rashes, cerebral-spinal meningitis (CSM), stroke, malaria and other related diseases (Sagoe, 2006). Climate change will affect every citizen, every part of our environment and our natural resources. Given the devastating effects of climate change on agriculture, it is pertinent to determine the level of awareness and perception of climate change among extension workers of the Agricultural Development Programme (ADP) in Niger



State. Therefore, the aim of this paper is to determine the level of awareness and perception of climate change among extension workers of the Agricultural Development Programme (ADP) in part of Niger State.

Niger State is located in the Middle Belt of Nigeria, it covers 76,363 square kilometres. It is the largest Nigerian State by land area. As of 26th August 1991 (Before the merger of Borgu and Agwara LGAs), The State covered a land area of 74,244 Square Kilometres, which is about 8% of the total land area of Nigeria. With the merger, the land mass is now 76,469.903 Square Kilometers (About 10% of the total land area of Nigeria) out of which about 85% is arable (Niger State Statistic Year Book, 2021).



**Figure 1: Map showing three (3) administrative zones of Niger State**

**Source: Niger State Geographical Information System (2021)**

### **Materials and Methods**

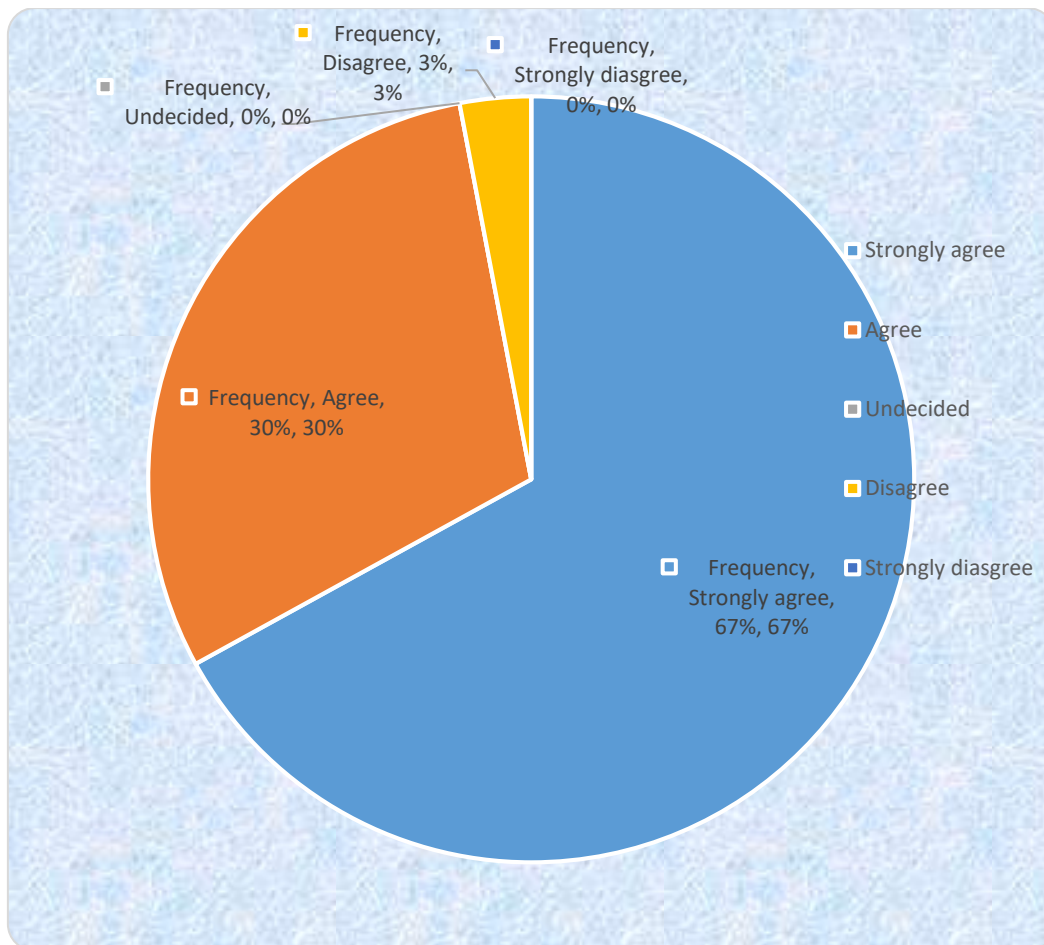
The sources of data used include primary and secondary. The primary data include reconnaissance survey, questionnaire administration and oral interview. In order to develop detailed and comprehensive literature review, the information were obtained from written documents. To achieve this therefore, data were sourced from the gazettes, internet facilities, text books, journals, published and unpublished thesis from University library with regards to determining the level of awareness and perception of climate change among extension workers of the Agricultural Development Programme (ADP) in part of Niger State. The



methods of data analysis used include both qualitative and quantitative data analysis methods. The Data analysis was analysed utilizing SPSS 22.0.

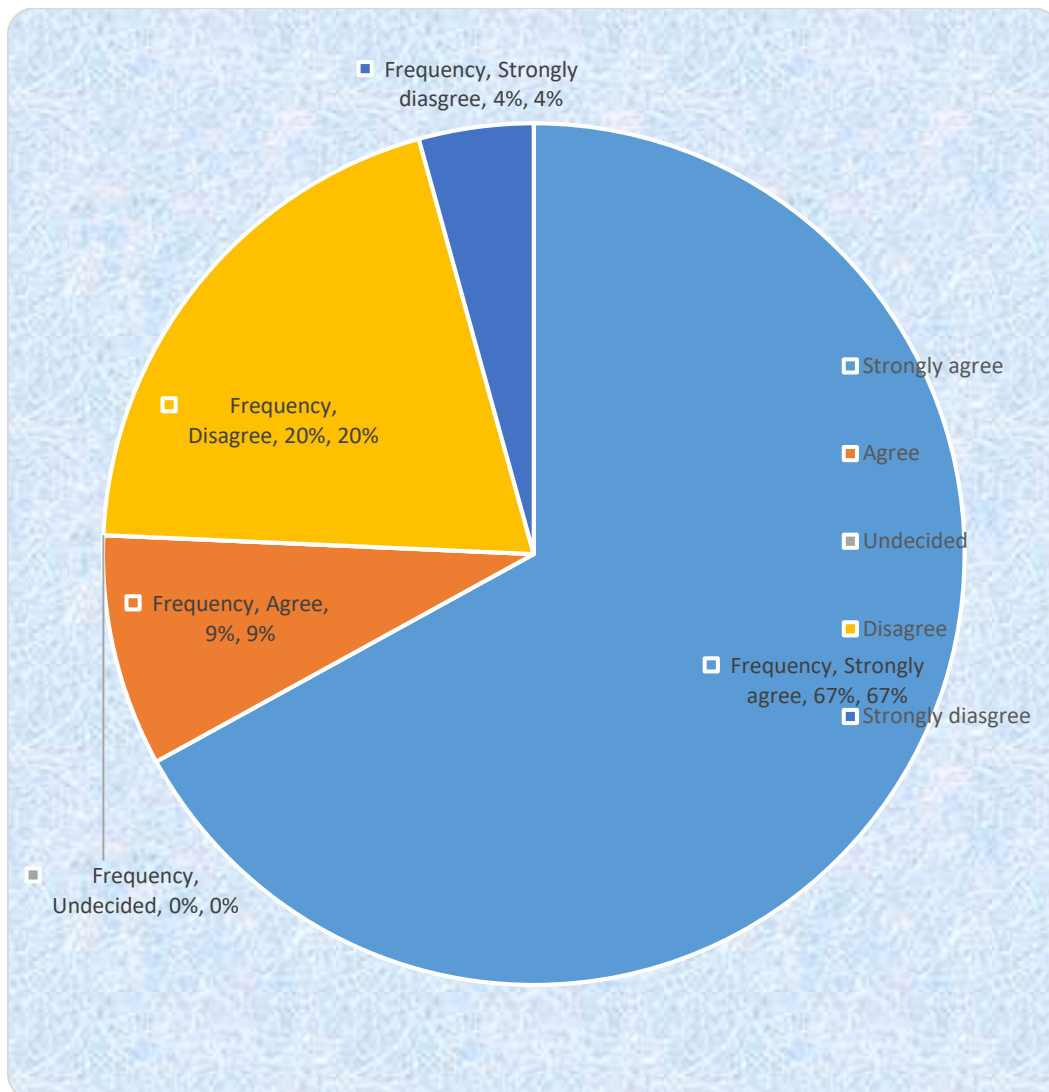
### Results and Discussion

Figure 2 shows the presence of sources of climate change information needed by ADP extension workers in the study area. The sampled population who agree constitute 97% while those who disagree constitute the remaining 3% of the entire sampled population. This revealed that the selected sampled population have different sources of climate change information needed to enhance their service delivery to farmers.



**Figure 2: Presence of sources of climate change information needed by ADP workers**

As shown in Figure 3 of the study, 75.7% of the sampled population agree that they used different sources of information to get knowledge about climate change while the remaining 24.3% of the sampled population have limited sources of climate change information. This shows that majority have access to sources of climate change information. The sources of climate change information include seminars, workshops, conferences, newspapers, Agricultural Research Institute, Internet, radio programmes related to climate change, symposium and bulletins.



**Figure 3: Distribution of sources of climate change information needed by ADP workers**

Table 1 revealed the distribution of sources of climate change information for ADP workers in the study area. Conference source ranked the highest with 255 sampled population affirming it, radio source ranked second with 252 sampled population affirming it while cell phone ranked the least with 9 sampled population affirming it. This shows that the major source of climate change information for ADP workers was conference organized by both the government and non governmental organizations.

**Table 1: Sources of climate change information for ADP workers**

S/N	Sources	SA	A	D	SD	Total
1	Radio	122	130	16	7	275
2	Newspaper	45	39	156	35	275
3	Television	21	11	235	8	275



4	Cooperative societies	103	75	67	30	275
5	Billboards	111	140	20	4	275
6	Cell phones	0	9	220	46	275
7	Internet	130	79	51	15	275
8	Bulletins	109	70	60	36	275
9	Non Governmental Organizations (NGOs)	120	130	17	8	275
10	Universities	3	56	193	23	275
11	Agricultural Research Institute	96	146	19	14	275
12	Meetings	100	123	10	42	275
13	Seminars	111	140	20	4	275
14	Conferences	120	135	13	7	275
15	Symposium	130	81	49	15	275
16	Farmers Association	102	76	64	33	275
17	Monthly Training Review Meeting	84	97	55	39	275

As revealed in Table 2 of the study, moderate knowledge ranked the highest with 72.7% of the sampled population, high knowledge ranked second with 16.4% of the sampled population and little knowledge ranked the least with 10.9% of the sampled population. This revealed that majority of the sampled population have moderate level of knowledge in climate change issues.

**Table 2: Level of knowledge in climate change issues**

Options	Frequency	Percentage (%)
Little knowledge	29	10.9
Moderate knowledge	194	72.7
High knowledge	44	16.4
<b>Total</b>	<b>275</b>	<b>100</b>

As shown in Table 3 of the study, moderate relevance ranked the highest with 72.7% of the sampled population, little relevance ranked second with 16.4% of the sampled population and highly relevance ranked the least with 10.9%. This revealed that majority of the sampled population believe that climate change knowledge is of relevance to ADP workers across the study area.

**Table 3: Relevance of climate change to ADP workers**

Options	Frequency	Percentage (%)
Agree	275	100
Disagree	0	0



Level of relevance		
<b>Little relevance</b>	44	16.4
<b>Moderate relevance</b>	194	72.7
<b>Highly relevance</b>	29	10.9
<b>Total</b>	<b>275</b>	<b>100</b>

Table 4 shows the perception of ADP workers on the causes of climate change in Niger State. The perceived causes of climate change include bush burning, cutting down of trees, burning of firewood for cooking, over grazing of farmland, ozone layer depletion and use of fertilizer/herbicide/pesticide as indicated in Table 4 of the study.

**Table 4: Perceived causes of climate change in the study area**

Causes	Strongly agree	Agree	Disagree	Strongly disagree
<b>Bush burning</b>	41%	56%	3%	0
<b>Cutting down of trees</b>	51%	49%	0	0
<b>Burning of firewood for cooking</b>	29%	47%	20%	4%
<b>Over grazing of farmland</b>	34%	47%	18%	1%
<b>Ozone layer depletion</b>	11%	63%	10%	16%
<b>Use of agro chemicals</b>	27%	56%	17%	0

As shown in Table 4 of the study, cutting down of trees ranked the highest perceived cause of climate change with 100% sampled population, bush burning ranked second with 97% sampled population, use of agro chemicals ranked third with 83% sampled population and ozone layer depletion ranked the least with 74% of the entire sampled population. This revealed that the major perceived cause of climate change is cutting down of trees.

Figure 4 shows the perceived indicators of climate change across the study area. The perceived indicators include excessive sunlight/heat, high humidity, irregular rainfall pattern, intense thunderstorm, drying up of stream/river, drought and increased flood occurrence as indicated in Figure 4 of the study. Irregular rainfall pattern ranked the highest with 29% of sampled population, excessive sunlight/heat ranked second with 21% of sampled population, increased flood occurrence ranked third with 19% of sampled population and drought (meteorological drought) ranked the least with 5% of the sampled population. This revealed that irregular rainfall pattern was the major perceived cause of climate change in the study area.

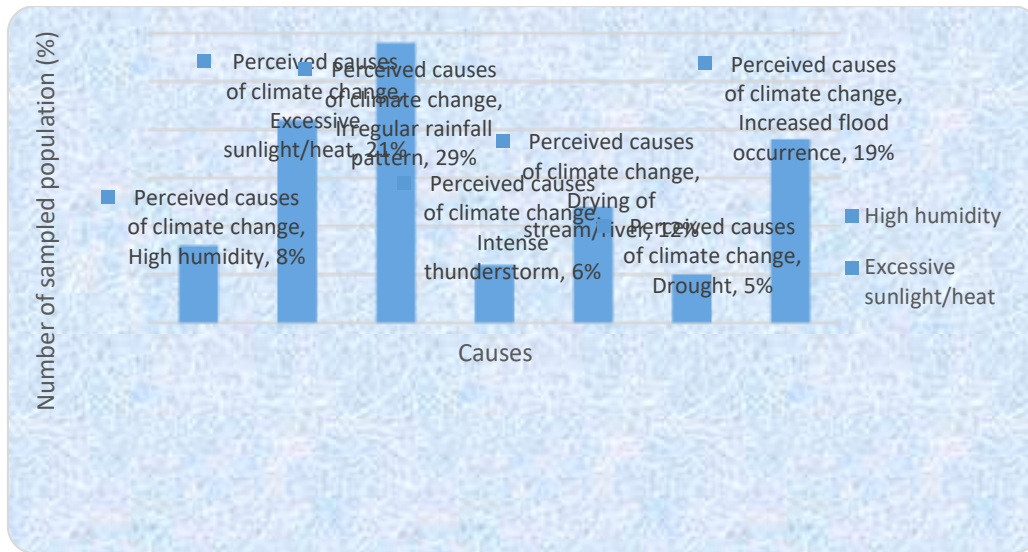


Figure 4: Perceived causes of climate change in the study area

Figure 5 shows the perceived effects of climate change across the study area. Reduced crop yield ranked the highest constituting 35% of sampled population, decreased in soil fertility ranked second constituting 20% of sampled population, increased crop pests and diseases ranked third constituting 17% of sampled population and loss of aquatic organisms ranked the least constituting 7% of the sampled population. This shows that reduced crop yield was the major perceived effect of climate change in the study area which is a factor of decrease soil fertility and increased crop pests and diseases in the study area. This agreed with the finding of Ibrahim (2017).

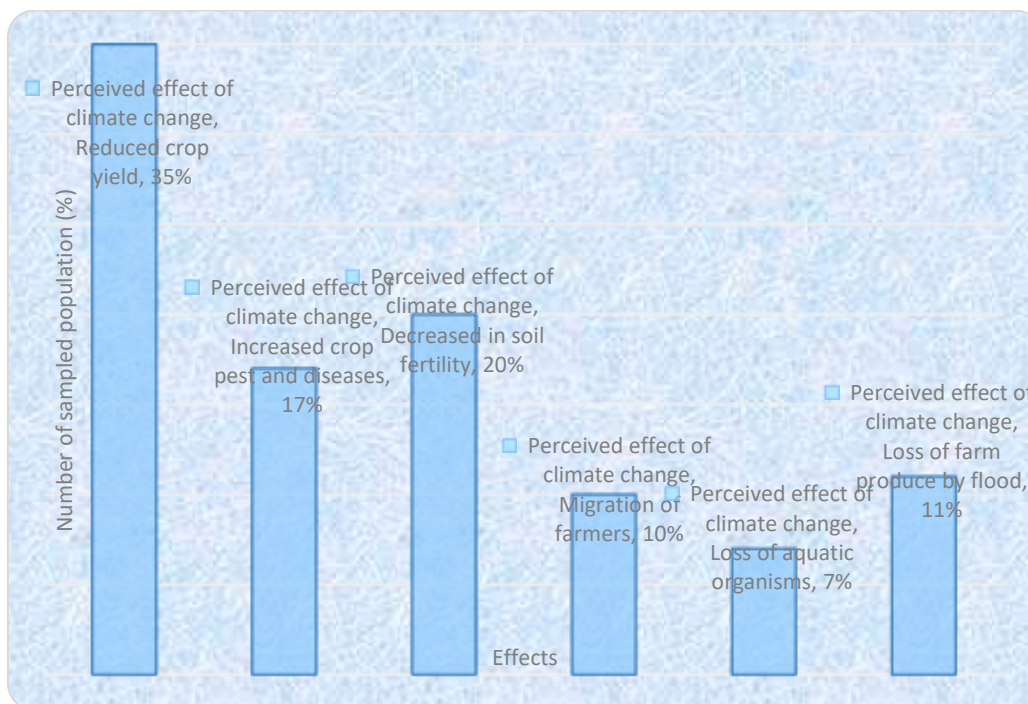


Figure 5: Perceived effects of climate change in the study area





As shown in Table 5 of the study, the perceived constraints in accessing climate change information include insufficient fund to support myself for training, inadequate financial support from my organization to attend climate change conferences, inability to access financial support from other funders outside my organization, Organization's rejection of my application to travel for trainings and excessive workload and limited time to attend workshop/seminars/conferences. Inability to access financial support from other funders outside my organization ranked the highest perceived constraints with 89.8% of the sampled population affirming it, inadequate financial support from my organization to attend climate change conferences ranked second with 83.5% affirming it, insufficient fund to support myself for training ranked third with 77.8% affirming it and the least perceived constraint was excessive workload and limited time to attend workshop/seminars/conferences with 33.7% affirming it. This revealed that the major perceived constraint was inability to access financial support from other funders outside my organization and the least was excessive workload and limited time to attend workshop/seminars/conferences.

**Table 5: Perceived constraints in accessing climate change information by ADP workers**

Constraints	SA	A	D	SD
<b>Insufficient fund to support myself for training</b>	51.3%	26.5%	15%	7.2%
<b>Inadequate financial support from my organization to attend climate change conferences</b>	43.2%	40.3%	12.5%	4%
<b>Inability to access financial support from other funders outside my organization</b>	48.5%	41.3%	7.5%	2.7%
<b>Organization's rejection of my application to travel for trainings</b>	7.2%	35.5%	27.6%	29.7%
<b>Excessive workload and limited time to attend workshop/seminars/conferences</b>	13.2%	20.5%	51.3%	15%

### **Conclusion**

The world leaders have for some years now been brainstorming on what or how to contend with the biggest threat of the moment, irregular change of climate otherwise known as climate change. This changes is negatively affecting the overall survival of human race and other living organisms on the surface of the earth, because lives of all living organisms depends on water, humidity, air, soil to survive. The air pollution occasioned by emission of gases from factories, vehicles, domestic use of fire woods, etc greatly affects the Ozone Layer and the earth crust thereby causing reduction in rainfall, humidity, and increases carbon dioxide concentration on earth which in turn lead to poor agricultural produce. However, the machinery put in motion by the government at all levels, international organizations and NGOs in the state to create awareness and encourage ADP workers to utilize given information yielded good results as the ADP workers level of awareness, access and utilization levels of information on climate change



are moderate, therefore the State has no reason not to be at the fore front of this governments economic diversification with agriculture as the focus, thereby improving the socio-economic activities of its populace who are literally farmers.

The paper concludes that agricultural extension agents in Niger State are aware of climate change but lack sufficient knowledge about it, and thus require training on a variety of climate change-related topics, most notably basic climate change concepts, the use of cultural practices to mitigate and adapt to climate impacts, and environmentally friendly management practices to reduce climate change impact within the study area. Extension agents face significant financial barriers to obtaining climate change training. Governments at all levels should increase their budgetary allocation to agriculture and provide accessible credit facilities to farmers to enable them insure their farms so as to minimize the burden of loss as a result of effects of climate change.

### References

- Abaje, I. B. & Giwa, P. N. (2017). Urban flooding and environmental safety: a case study of Kafanchan Town in Kaduna State. A paper presented at the golden jubilee (50th anniversary) and 49th annual conference of the Association of Nigerian Geographers (ANG) held on 15th –19th October, 2017 at the Department of Geography, University of Abuja, Gwagwalada-Abuja.
- Abdulhamid, A. (2015). Climate, Droughts and Food Security in Kano Region – Nigeria. *Techno Science Africana Journal*, 11(1), 8-15.
- Eitzinger, J., Orlandini, S., Stefanski, R. & Naylor, R. E. L. (2010). Climate change and agriculture: Introductory editorial. *J. Agric. Sci.* 148(1), 499–500.
- Elum, K. and Mamman, M. (2016). Access and Utilization of Climate Change Information and Support Services among Vulnerable Communities in Agatu L.G.A., Benue State, Nigeria. *Federal University Gusau International Journal of Science for Global Sustainability*, 2 (2), 46-63
- Ibrahim, M. (2017). Climate Change? What Climate Change? Nigerian Farmers not being change on the food security and livelihoods of small-scale farmers in Kenya, Nigeria, Senegal and Zimbabwe reached on Awareness. Part of a special project that explores the impact of climate GODAI/NIGERIA, 5 July. Available online @ [http://www.CLIMATE%20%20CHANGE%20INFO/IRIN%20\\_%20Climate%20change%20%20What%20climate%20change%20awareness.html](http://www.CLIMATE%20%20CHANGE%20INFO/IRIN%20_%20Climate%20change%20%20What%20climate%20change%20awareness.html)
- Leeuwis, C. (2006). *Communication for Rural Innovation: Re-thinking Agricultural Extension*, 3<sup>rd</sup> ed. The Netherlands, Publishing, Pp 27.
- Madzwamuse, M. (2016). Climate Change Vulnerability and Adaptation Preparedness in South Africa. Available online: [https://za.boell.org/sites/default/files/downloads/HBF\\_web\\_SA\\_28\\_2.pdf](https://za.boell.org/sites/default/files/downloads/HBF_web_SA_28_2.pdf) accessed 9<sup>th</sup> December, 2021.
- Nkomwa, E. C., Joshua, M. K., Ngongondo, C., Monjerezi, M. & Chipungu, F. (2014). Assessing indigenous knowledge systems and climate change adaptation strategies in agriculture: A case study of Chagaka village, Chikhwawa, Southern Malawi. *Phys. Chem. Earth*, 67(1), 164–172.
- Odey, E. (2016). Mitigating Climate Change in Nigeria: African Traditional Religious Values in Focus. *Mediterranean Journal of Social Sciences* 7(6), 299-308.
- Ola, S. S. (2019). Factors influencing agricultural extension officers' knowledge on practice and marketing of organic agriculture in North West Province. *South Africa Life Science Journal*, 1, 22-29.
- Sagoe, R. (2006). Crops research institute, kumasi: A report prepared for environmental protection agency (EPA), Accra-Ghana, accessed from [rgn1@psu.edu](mailto:rgn1@psu.edu) on 17th April, 2011.
- Terdoo, F. & Adekola, O. (2014). Perceptions, knowledge, adaptation and socio-economic cost of climate change in Northern Nigeria. *J. Agric. Sci.* 6(1), 60–71.