INTERNATIONAL JOUNAL OF: BUILT ENVIRONMENT AND EARTH SCIENCE

TIMBOU-AFRICA ACADEMIC PUBLICATIONS
INTERNATIONAL JOURNAL, NOVEMBER, 2022 EDITIONS
VOL. 11 NO. 4 ISSN: 1881-2167

EFFECT OF CLIMATE CHANGE AND ENVIRONMENTAL DEGRADATION, MITIGATION AND ADAPTATION AMONG THE PEOPLE OF YOBE STATE, NIGERIA

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ABSTRACT

Climate change environmental degradation and human activities have become a major challenge in Nigeria and have several direct and indirect impacts on health, and are a massive threat to human development and in some places it is already undermining the achievement of the Millennium Development Goals (MDGs) and the international community's efforts to reduce extreme poverty. The issue of climate change is global and Nigeria is not excluded from its threat. Environmental degradation, climate change impacts are extremely upset and shocked due to their vulnerability and low coping capability. The Sources of data used

Introduction

Climate change and environmental degradation has emerged as one of the most devastating environmental threats and has become the major challenge globally. It is important to assess the awareness regarding climate change and Environmental Degradation in the general population to manage the mitigation activities. Climate change and Environmental Degradation are serious challenge facing the entire world today; there impact felt in all facets of life they poses a serious threat to poverty eradication and sustainable development, particularly in the developing countries including Nigeria, thereby reaching the Millennium Development Goals (MDGs) difficult. Without addressing climate change achieving the eight MDGs will be burdensome. The reason is that MDG No. 1 (Reducing poverty and Hunger) which is pivotal to all the remaining seven is seriously being affected by the climate change (Adebayo, 2010).Every human being relied on the environment for existence, sustenance and survival. Climate change arises from the activities of man and has become the subject of debates and discourse among experts, According to odey (2012). Evidence has also revealed that climate change is considered the most serious threat to the survival and sustainable development of humanity and the environment. It can also refer to a change in climate which is formed by human activities and coined as an increase in average global temperature, which is caused by natural event and human activities such as mining, farming, burning and others that can alter the atmospheric composition of the earth which lead to global warming.

in the study are, primary and secondary source of data. The primary includes observation, interview and questionnaire while the secondary used related literatures and journals to justify the findings. Thus, about 500 structured questionnaires were used to source data from respondents. The study found that the primary cause of the menace include burning of fossil fuel, greenhouse emission, increase in temperature, rainfall, extreme weather. These increased health risks such as chronic sickness, Sickle Cell Anemia more also Malaria, high blood pressure, skin cancer, Cerebra Meningitis were also direct consequences of climate change. Lastly, the study found that very few in the study area are using local adaptation method to limit the menace of climate change and environmental degradation through Multiple Cropping, Adjusting Farming, Applying Irrigation, Tree Planting and changing Cropping. It concludes by identifying the reasons for the effect of climate change. Finally the study recommends that Government should raise awareness on the adverse effect of climate change which is common among the vulnerable in Nigeria, Implement laws and regulations based on the existing regulations on land use.

Keywords: Climate change, Degradation, Environment, Effect, Mitigation, Adaptation, Yobe, Nigeria

Nigeria being a developing country with a population of about 180 million in the sudano sahelian zone (Abdussalam *et al.,* 2014) is vulnerable to a countless number of climate change impact in the forms of temporal shifts in recurrent climatic events such as excessive rainfall, drought, elevated summer temperature, changes in tidal regimes and heights, desert encroachment among others. Evidences have shown that climate change impacts on Nigerians arise from various climate change-related causes such as increase in temperature, rainfall, sea level rise, impact on fresh water resources, extreme weather events, flooding, drought in the north and increased health risk. It is considered as the most expansive global environmental economic and political problem facing humanity (George, T.O. and Ozoya, M.E. 2014). Thus climate change and environmental awareness are always considered as a part of formal environmental education that helps the development of a sense of responsibility through the Creation of informed awareness. Such awareness is necessary to guide people behavior towards concerted ameliorative actions (McMillan *et al.,* 2004; Kuhlemeier *et al.,* 1999; O'Connor *et al.,* 1999). Consequently, public climate education has already been emphasized by the world policy makers (UNCED, 1992).Widely disseminated information about environmental degradation, vulnerability and impact has already increased the interest among people (Pekel and Ozay, 2005). Climate change and environmental degradations affects vulnerable groups because of a variety of factors including low adaptive capacity, limited resources, and poverty. In general, climate change and Environmental Degradation tends to exacerbate differences among various groups. The vulnerable and socially marginalized groups such as the poor, children, women, the elderly, and indigenous peoples tend to bear the brunt of environmental change (BNRCC, 2011). In the specific environment of Nigeria, children and women are more vulnerable to the effects of climate change than men primarily as they constitute the majority of the country's poor and are more dependent for their livelihood on natural resources that are threatened by climate change.

Human activities on the environment have resulted in the Continues and serious degradation of the land and as well the ecosystem. Human beings use the environment as a resource bank Rapid population growth and urbanization is of great concern to the sustainability of cities. The more people are there on the earth, the greater the impact on the environment and pressures on resources. As such, the unwise use of the natural environment due to ignorance, poverty overpopulation and greed among others has led to deforestation, degradation of the environment and climate change. Currently, deforestation constitutes one of the global development challenges, specifically, it is the most serious long term environmental problem facing the world and Nigeria is not an exception. Adebayo (2010) express that illiteracy and poor living conditions are the main causes as well as consequences of environmental degradation. The high level of poverty and illiteracy in Africa directly linked to the current level of environmental pollution and degradation in the continent. The poor and the illiterate are often lead to more reckless environmental behavior which in turn breeds more environmental problems and leads to poverty. In Yobe state of Nigeria, Traffic conjunction, burning of fusil fuel, desertification and increase in number of dry days, decrease in annual rainfall and increase in maximum temperature are all evidence of climate change many social, biological and geo physical systems are at risk from climate change. The major challenge facing the state is how to mitigate and adapt to climate change and environmental degradation. Changes in climate factors have significant consequences for the agricultural activities in the study area. The high temperature and low rainfall climatic condition of the environment increase high rate of evaporation and reduce soil moisture which inadvertently reduces farming activities as it causes shrinkage of surface water for instance Lake Chad and other secondary seasonal rivers in Komadugu region. Change in rainfall pattern and intensity leads to decrease in agricultural productivity in most part of the northern state (livestock and crop production) as it causes erratic weather occurrence such as drought and heat stress which causes shortage of water for livestock and farming in the sahelian region. Despite the number of documented literatures on climate change related issues, the effects of climate change and environmental degradation mitigation and adaptation in Yobe state were mostly limited, there are many research studies conducted on the effect of climate change in Nigeria based on the knowledge gap identified on climate related issues however few to mention are studies by F.M. Onu and M.E. Ikehi (2016) Mitigation and adaptation strategies to the effect of climate change on the environment and agriculture in Nigeria. Moreover T.E. Olagunju, S.O. Adewoye, O.A. Opasola (2021) Climate Change Impacts on Environment, Human Displacement and Social Conflicts in Nigeria, However all these research mentioned were not done in the same study area and are different methodologies, a research conducted by U.S. Onoja, U.M.E. Dibua and A.A. Enete (2021) Climate change causes, effects and mitigation different study area but touches adaptation aspect. Research conducted by Abdullahi, Yusuf and Kamoli (2021) effect of climate change on human health, they touches some part of the study area but did not touches the entire state, they also used primary and secondary data for their research, and they do not put more emphasis on the Degradation, mitigation and adaptation. In this view, this research bridges a gap by assessing the Degradation adaptation and Mitigation, determining the adaptation and Mitigation measures, examining the effect on the community and identifies the control measures to manage the menace.

STUDY AREA AND METHODOLOGY

Study Area

Yobe state is located in the north east zone of Nigeria, with a latitude 12^0 00' N and longitude 11^0 30' E covering a land area of about 45,502 Square kilometers (KM^2), with a population of about 2,321,591 people (Galadima, 2014) is a state that is endowed with vast Agricultural, fishing and livestock development potentials. While Yobe state is an agricultural state it also has rich fishing ground and mineral deposits of gypsum in Fune L.G.A. The state's agricultural

products include gum Arabic, groundnuts, beans and cotton. The state is also said to have one of the largest cattle markets in West Africa, located in Potiskum. Despite these Yobe state, like most Nigerian state is still faced with food insecurity. The drive to achieve the food security and national development objectives as espoused in the Agricultural production, storage and marketing as well as research and development imperative (Galadima, 2014)

Data Type and Variables

The systematic survey was conducted in Yobe State to assess the effect of climate change and environmental degradation among the people of Yobe State, Nigeria. Mixed method approach was utilized for the research. Considering the vulnerability of climate change in Yobe state, systematic random sampling technique was adopted to select the study sample area. Five (5) Local governments have been selected randomly based on climate vulnerability. Thus, about one hundred (100) questionnaires was dispatch randomly in each of the selected Local Government Areas. Structured interviewer questionnaire was arranged for those who cannot read nor write. Also, focus group discussion was organized with each of the community members. The Sources of data used in the study area are, primary and secondary sources of Data. The primary source includes field survey for the physical observations of the environment, interviews, and the use of a structured questionnaire while the secondary sources include the use of related literatures and journals to justify findings.

Sampling Technique

The study population covers both urban and rural male and female population of the study area including patients found at the hospitals and health care centers in the course of study, Also people from the general public were also participated in the study to enable them express their views and opinion on climate change impact. Thus, the study population was distributed accordingly in the population cohorts (Children, adult and aged people).

RESULTS AND DISCUSSION

This table presents the findings of this study in summary. A total number of 500 questionnaires were administered to respondents to answer. Analysis and Findings as indicated in the data and table below, from the list of environmental problems provided refer to table below for interpretation of the codes.

Table 1: Showing codes used in table 2: below

Study areas (L.G.A)	Codes
Damaturu	A
Gaidam	B
Gashua	C
Gujba	D
Patiskum	E

Socio-Demographic data of five selected LGA's of Yobe state

The data revealed that Patiskum has the highest percent of respondents from 41 and above age group with a valid percent of 43%, and lowest number of respondents is from Gaidam from

41 and above age group with a valid percent of 3%. The highest percent of female respondents was recorded in Damaturu with a valid percent of 39% and the lowest percent recorded is male respondents from Gujba with a valid percent of 7%. The highest percent of Not Married (Single) respondents from the study areas was recorded in Damaturu with a valid percent of 39% and the lowest percent recorded is in Damaturu with 0% of Divorced women. The highest percent of respondents recorded in the study areas with Degree and valid percent of 38% was in Gaidam and the lowest percent was in Damaturu with a valid percent of 0% having Primary. The highest percent recorded 72% Civil Servant in Damaturu town and the lowest percent recorded in Damaturu with 4% Artisant. The highest percent of respondents recorded was in Gaidam with a valid percent of 24% responding to the awareness on Environmental degradation and climate change issues in the study areas saying there is awareness and the lowest percent was in Gujba 17% and Patiskum 17% saying there is no awareness. The highest percent of respondents responded to the Benefit of climate change issues in the study areas was in Damaturu with a valid percent of 36% indicating No Benefit and the lowest percent indicating No Benefit from Gujba with a valid percent of 9%. The highest percent of respondents responded to the Environmental Issues in the study areas are from Damaturu responded with waste Disposal as their problems with a valid percent of 35% and the lowest percent was from Gujba with 3% indicating waste Disposal. The highest percent of respondent's respondent to the Activities taking place and related causes of climate change and environmental Degradation in the study areas was from Damaturu Indicating Burning of fossil fuel as their problems and the lowest percent was from Gujba indicating Burning of fossil fuel with a valid percent of 4%. The highest percent of respondents responded to the Level of their Relationship with Climate change and Environmental Degradation was from Damaturu indicating Bad and Aggressive with a valid percent of 48% and the lowest percent was from Gashua indicating Bad and Aggressive with a valid percent of 5%. The highest percent of respondents responded to the adaptation and mitigation strategies of Climate change and Environmental Degradation in the study areas was from Gaidam indicating Doing Prayers with a valid percent of 67% and the lowest percent was from Damaturu, Gashua and Patiskum with 0%.

Variables	freq of A	%	freq of B	%	freq of C	%	freq of D	%	freq of E	%
AGE										
16-20	14	25%	17	30%	11	19%	5	9%	10	17%
21-25	21	26%	15	18%	13	16%	9	11%	24	29%
26-30	31	33%	15	16%	8	8%	12	13%	28	30%
31-35	39	35%	22	20%	15	14%	10	9%	24	22%
36-40	33	32%	18	18%	17	17%	11	11%	22	22%
41 – Above	13	23%	7	3%	4	17%	8	14%	24	43%
SEX										
Male	102	33%	88	28%	43	14%	22	7%	57	18%
Female	73	39%	27	14%	25	13%	22	12%	41	22%
Marital Status										
Married	99	37%	40	15%	28	11%	28	11%	70	26%
Single	63	39%	34	21%	16	10%	14	8%	36	22%
Widow	2	7%	7	25%	7	25%	4	14%	8	29%
Divorced	0	0%	6	14%	11	25%	13	29%	14	32%
EDUCATION										
Non formal	3	8%	6	17%	12	33%	7	20%	8	22%
Primary	0	0%	6	29%	5	24%	7	33%	3	14%
Secondary	15	17%	11	12%	12	14%	29	33%	21	24%
NCE/Diploma	11	11%	14	15%	29	30%	21	22%	21	22%
Degree	32	24%	39	30%	44	33%	3	2%	15	11%
M.Sc/Ph.D	22	17%	48	38%	21	17%	2	2%	33	26%
OCCUPATION										
Petty Trading	8	10%	22	20%	29	24%	20	20%	19	20%
Civil Servant	58	72%	43	40%	32	27%	24	25%	45	47%
Farmer	11	14%	25	23%	35	30%	34	35%	24	25%
Artisan	3	4%	18	17%	22	19%	20	20%	8	8%

Source: Field Survey, 2022

TIJBEES
ISSN: 1881-2167

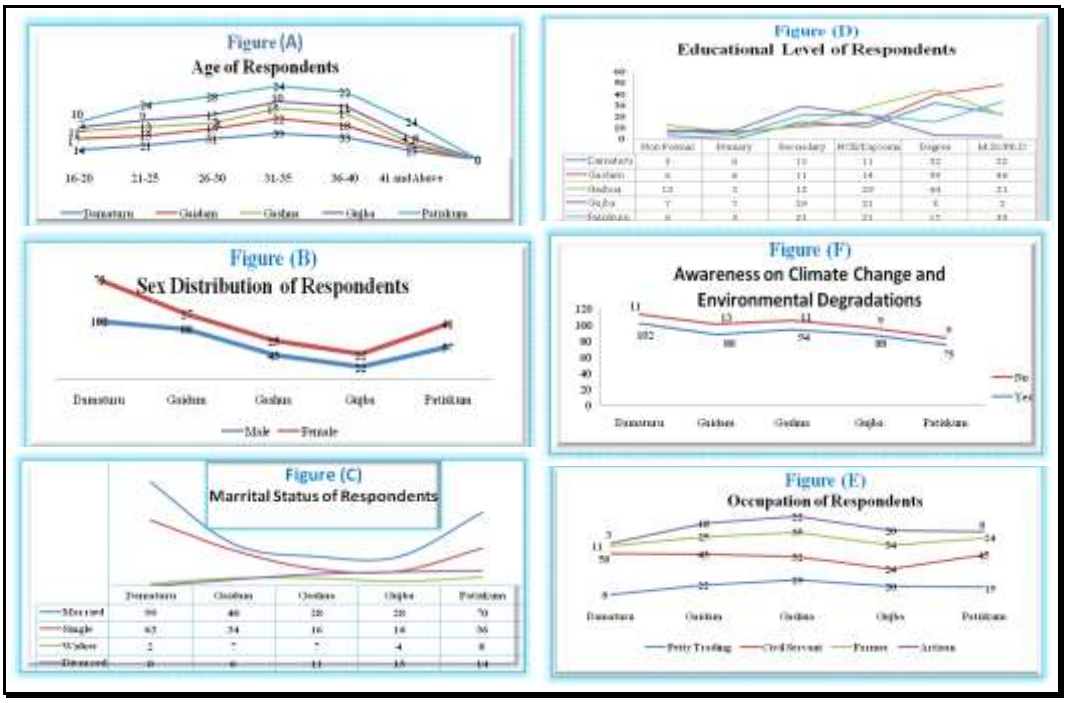
Variables	freq of A	%	freq of B	%	freq of C	%	freq of D	%	freq of E	%
AWARENESS LEVEL										
Yes	102	23%	88	19%	94	21%	88	20%	75	17%
No	11	21%	13	24%	11	21%	9	17%	9	17%
BENEFIT OF CLIMATE CHANGE ISSUES										
Earn money	19	12%	36	23%	33	21%	31	19%	39	25%
No Benefit	123	36%	89	26%	44	13%	30	9%	56	16%
ENVIRONMENTAL ISSUES										
Dry Land	19	32%	11	19%	9	15%	7	12%	13	22%
High rate of casualty	22	31%	16	23%	14	20%	11	15%	8	11%
Spread Disease	28	32%	13	15%	18	20%	11	12%	19	21%
Introduce Poverty	17	29%	11	19%	9	15%	10	17%	12	20%
Hunger	21	21%	15	15%	10	10%	21	21%	32	33%
Draught	1	11%	3	34%	2	22%	2	22%	1	11%
Air Pollution	2	12%	6	28%	4	35%	3	19%	1	6%
Waste Disposal	20	35%	12	21%	5	9%	2	3%	18	32%
Water Pollution	5	28%	4	22%	3	17%	2	11%	4	22%
Flooding	4	33%	3	25%	2	17%	2	17%	1	8%
Erosion	2	18%	3	27%	1	9%	1	9%	4	37%
ACTIVITIES TAKING PLACE AND RELATED CAUSES										
Burning of fossil fuel	27	51%	12	23%	8	15%	2	4%	4	7%
Green house emission	30	39%	19	25%	12	16%	7	9%	8	11%
Increase in temp.	19	16%	42	35%	33	28%	14	12%	11	9%
Rainfall	11	13%	22	27%	23	28%	16	19%	11	12%
Extreme Weather	54	32%	26	15%	28	17%	16	9%	45	27%
LEVEL OF RELATIONSHIP										
Good and Cordial	25	30%	17	20%	13	15%	9	11%	20	24%
Bad and Aggressive	201	48%	98	24%	23	5%	29	7%	65	16%
ADAPTATION AND MITIGATION STRATEGIES										
Multiple Cropping	9	7%	38	32%	45	38%	21	18%	6	5%
Adjusting farming	0	0%	16	22%	21	30%	12	17%	22	31%
Applying Irrigation	10	7%	33	25%	41	31%	15	11%	34	26%
Plant Trees	13	52%	2	8%	2	8%	1	4%	7	28%
Changing Cropping	7	18%	13	34%	5	13%	4	11%	9	24%
Do Nothing	32	29%	17	15%	19	17%	25	23%	18	16%
Do Prayers	0	0%	2	67%	0	0%	1	33%	0	0%

Source: Field Survey, 2022

Socio-economic characteristics of the Respondents deals with analysis and interpretation of the information collected from respondents residing within the study area. However, the analysis was done based on the information gathered through the questionnaire. The analysis and interpretation of the findings are presented under sub–headings as being designed on the questionnaire. In the **figures below, (A)** the age structure of the respondents are shown. The age groups were drawn into 5- year class intervals of 16-20, 21-25, 26-30, 31-35, 36-40 and 41-above in order to ensure adequate representation. The age group of the respondents within the interval of 16-20 recorded 57 Respondents making 12%. Age structure of 21-25 recorded 82 Respondents with a valid percent of 16% whereas age structure of 26-30 recorded 94 Respondents making 19%, the highest count of the respondents age group fall in the category of 31-35, recording a number of 110 Respondents with a valid percent of 22%. This implies that the structure of the respondents is concentrated at this age group revealing youthful age of the respondents with 36-40 recording 101 respondents with a valid of 20%, 41 and above

recorded 56 respondents with a valid of 11%. This shows that respondents from Damaturu are willing to participate in the survey with a highest valid number of 151 Respondents and 39 respondents are within the aged group of 31-35 years. The lowest number of respondents is in Gujba with a valid number of 55 respondents, and 5 respondents are within the aged group 41 and above age group.

(n=500)

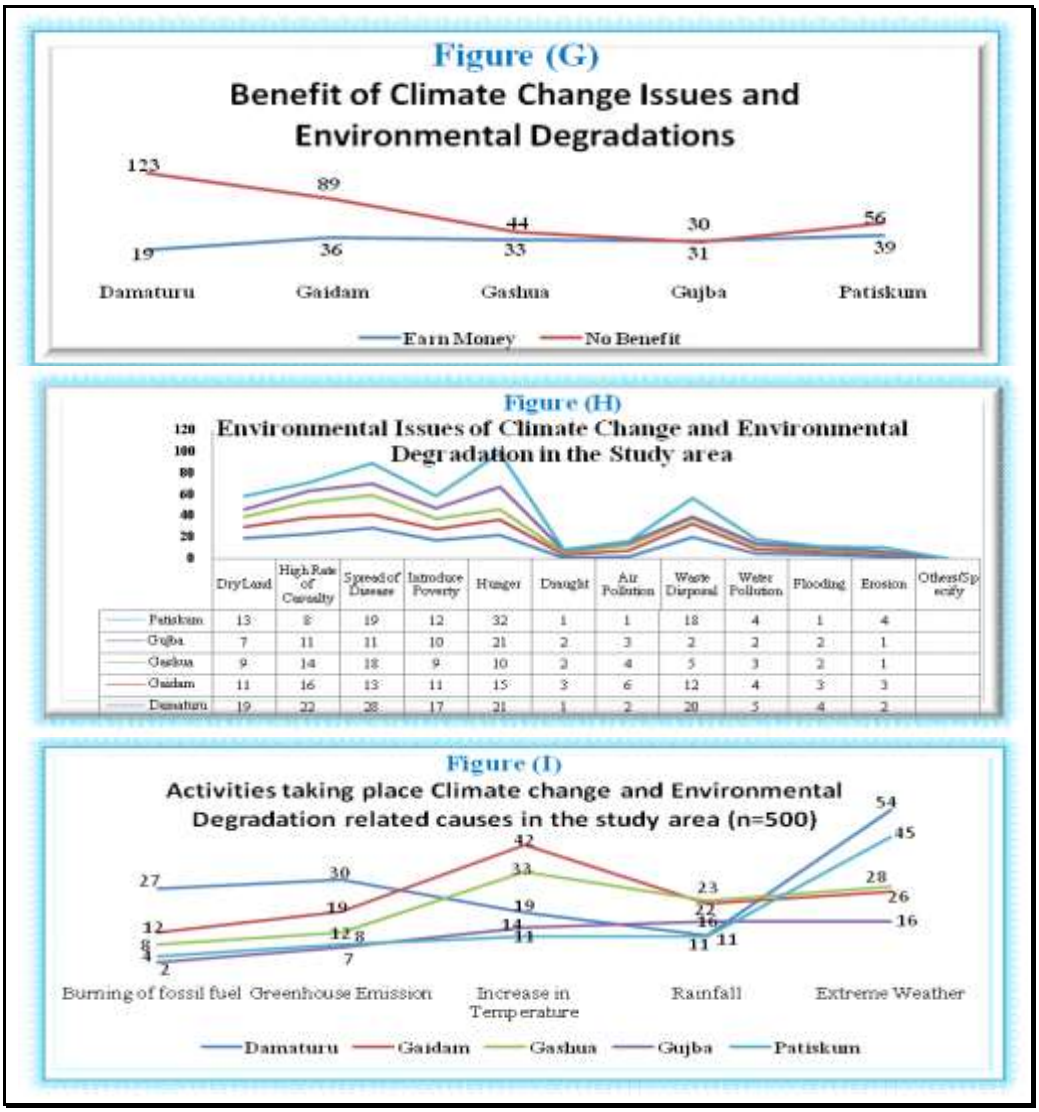


Source: Field Survey, 2022

Figure (B) Above shows the gender of the respondents, with valid percent of 62% male and 38% female. The reason way male respondents is higher than that of females is because female in the Northern part of Nigeria are shy to participate in such kind of research due to the nature and culture of the environment. Damaturu has the highest count of male respondents with 102 respondents and Gujba has the lowest male respondents with 22 respondents and female respondents in Damaturu has the highest count among the females in the study areas with 73 respondents, Gujba having 22 female respondents. This shows that respondents from Damaturu are willing to responds to this survey both male and female. **Figure (C)** shows the marital status of the respondents, with 53% Married, 33% Single, 5% Widows and 9% Divorced. Damaturu having the highest married participant of 99 respondents in the survey while Gujba, Gashua having lowest married participant of 28 respondents each. **Figure (D)** Above shows the literacy Level of respondents; the study revealed that the majority of the respondents were educated, with 126 of the respondents having M.Sc and Ph.D, 133 respondents having B.Sc, 96 with NCE and Diploma, followed by the secondary school with 88 of the respondents, then 21 respondents attended Primary school and lastly 36 of the respondents informal education. **Figure (E)** shows the respondents occupations with 20% Petty Trading, 40% civil servants, 26% farmers, 14% Artisan therefore majority of the respondents in the study areas of Damaturu, Gashua, Gujba, Potiskum and Gaidam are doing something for a living. **Figure (F):** Indicate that

447 Respondents with valid percent of 89% have much awareness on climate change and Environmental Degradation issues through head line of National Television, Damaturu having the highest number of respondents on awareness level of climate change and environmental degradations with a number of 113 respondents saying they were aware of the menace. In fact, they are much aware that climate change and environmental degradation is already happening; it is clearly in different ways people are already experiencing its impacts, it is an immediate and urgent concern; it is a threat to sustainable development; and there are research

institutions in various levels that look into this issue. Though there is no difference observed, whereas 53 Respondents with valid percent of 11% in the study areas are not aware of the menace, Gaidam having 13 respondents saying they were not aware of the menace of climate change and Environmental Degradation therefore the data indicate that awareness level about climate change and environmental degradation is relatively high, but this does not guarantee exposure as people tend to be selective on whether or not to participate in the programs.



Source: Field Survey, 2022

Figure (G): Above shows the perceptions of the respondents on benefit of climate change and environmental degradation on human being and the environment, 158 respondents in the study areas with a valid percent of 32% respond that they earn money on the issues of climate change and environmental degradation, while Potiskum having the highest number of respondents of 39 and followed by Gaidam having 36 respondents saying they earn more money in the issue of climate change and environmental degradation, with that most of the communities in the study areas earn money on the issue of climate change and environmental degradation and the other side recorded 342 Respondents with a valid percent of 68% respond that there is no Benefit on Climate change and environmental degradation issues in all the study areas, Damaturu recorded about 123 respondents saying that there is no benefit in the issues of climate change and environmental degradation while 30 respondents recorded from Gujba saying there is no benefit too. As most people in the rural areas use fuel wood to cook and build their houses and shelters, this caused environmental degradation in the communities. Furthermore, the act of cutting down trees without replacement for re-generation purpose has great implication especially to the rural population. For long, green vegetation (forest) are already under great pressures arising from increasing populations and growing economic wealth leading to greater demand for forest resources. Climate change has added to these pressures, through direct impacts of the changing climate on forest growth and development and through greater demands on forests by populations adjusting to climate change.

Furthermore, environmental mismanagement attitude has become one of the common habits among the population of urban dwellers in the study areas of Damaturu, Gujba, Gaidam, Gashua and Potiskum. This has being reflected in method of littering and dumping of non-bio gradable and recyclable waste inappropriately. Thus, despite the influence of climate change and environmental degradation on human activities in Yobe state most of the population lack awareness on the causes of detrimental environmental changes in the community especially the rural population whom they mostly lack adaptation strategies to such vulnerability to health, agriculture and socioeconomic activities. They mostly utilized only local adaptation due to the incapability to acquire modern techniques and adaptation skills from climate change expert at low level. The magnitude and frequency of climate and environmental mismanagement has expanded from micro-scale to global scale with intensive direct and indirect impacts, Yobe state being one of the states at fringes of the sub Saharan Africa is challenge with the menace of environmental deterioration, considering the seasonal change of weather throughout the year. Dry wet and cold season changes in weather proliferated with poor environmental management has posed serious environmental challenges in the community which most people are not aware of it. Heat waves increases during the summer season in northern fringes of the state including Gaidam, Gashua and Yusufari buffers proliferate the risk of morbidity and mortality. For instance during the summer season of March, April and May the frequency of high temperature health relate illness increases. Hospital, clinic and health care centers in Yobe state records high number of cases of high blood pressure, heat stroke, heat rashes, heat syncope, meningitis and heart cramp whose symptoms are indicated with dizziness. Thus, November-February winter season is always link with hypothermia climate related health illness such as Flu, asthma, arthritis, heart attacks and back pain which symptoms are reflected with sore throat, dry and dusty air, cracked lips and foot, cough and catarrh. Thus climate extreme such as windstorm, dust-storm, floods and guily

erosion during the wet season led to the destruction of hundred houses and properties in most part of the state. Thus, agricultural activities dwindle in northern part of the state. Changes in climate factors have significant consequences for the agricultural activities in the study area. The high temperature and low rainfall climatic condition of the environment increase high rate of evaporation and reduce soil moisture which inadvertently reduces farming activities as it causes shrinkage of surface water (for instance Lake Chad and other secondary seasonal rivers in Komadugu region). Change in rainfall pattern and intensity leads to decrease in agricultural productivity in most part of the northern state (livestock and crop production) as it causes erratic weather occurrence such as drought and heat stress which causes shortage of water for livestock and farming in the sahelian region.

Geographic impacts

Climate change in the study area affects the nature and characteristics of freshwater resources on which many Nigerians depend on, extreme weather condition will also affect the ability to fish which lead to poverty and hunger. Rainfall variation and heat stress can adversely affect food production and result in food shortages (Abdulkadir *etal*., 2017; Elum *et al*., 2017; Ebele and Emodi, 2016; Enete IC, 2014). The availability of inland fisheries is also threatened by increased salinity and shrinking rivers and lakes (Ebele and Emodi, 2016; BNRCC, 2011).

Health Risk Associated with Climate Change

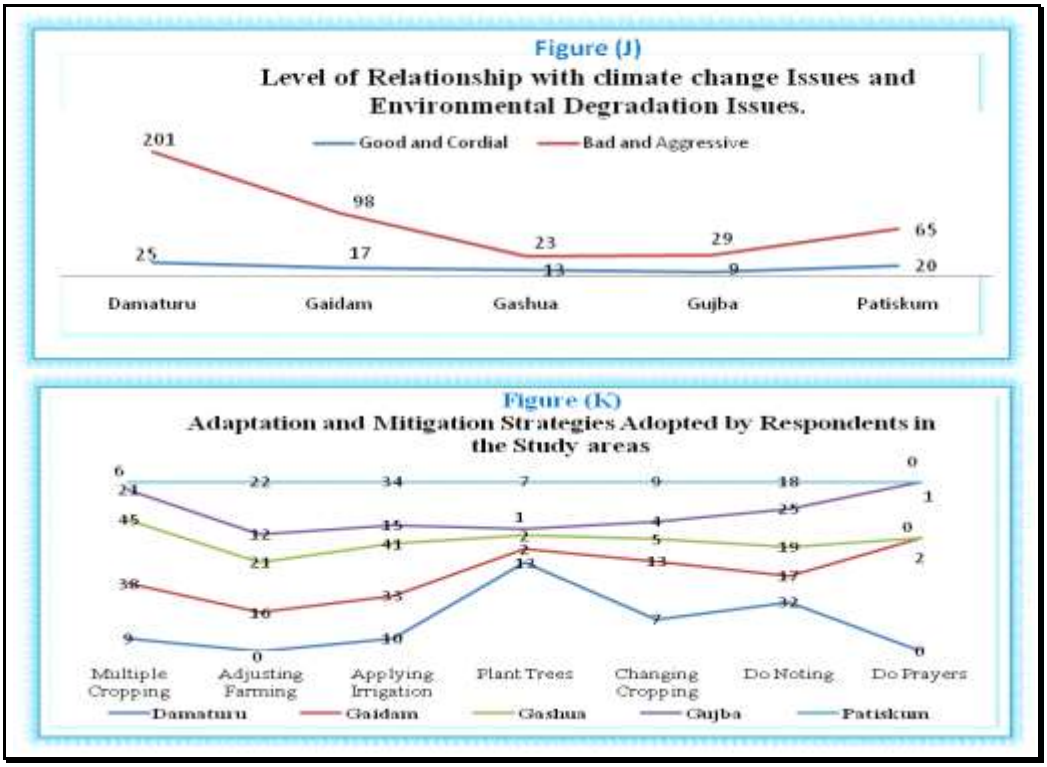
Health Risk incidence associated with climate change were also identified as direct consequences of climate change in the study areas, a Focus Group Discussion by Medical Personal indicate that most of the disease incidence are recorded in the month of April and August due to the variability of temperature and increase in rainfall, the temperature in the month of August will increase the number of Chronic Sickness which majority of the people experienced. The most significant disease outbreak is associated with Malaria, High Blood Pressure, Skin Cancer, Cerebra Meningitis, and Sickle Cell Anemia.

Figure (H) Above shows the perceptions of respondents on the effect of climate change and environmental degradation in five local government areas of Yobe state, 12% of the Respondents respond that most of the issues in their communities are dry Land while Damaturu along having the highest number recorded with 19 respondents followed by Gashua 13 respondents and Gujba recorded the lowest number with 7 respondents, and other side recorded 14% in all the study areas with high rate of casualty Damaturu having 22 respondents and Gaidam having 16 respondents while Potiskum recorded the lowest count of 8 respondents, 18% spread of diseases which Damaturu recorded 28 respondents and potiskum recorded 19 respondents and Gujba also recorded a lowest number of 11 respondents, 12% introduce poverty among them Damaturu with the highest count of 17 respondents while Gashua only 9 respondents having the lowest count, 20% Hunger while Potiskum recorded 32 respondents and followed by Damaturu with 21 respondents the lowest count is Gashua with 10 respondents, 2% Draught Gaidam with 3 respondents followed by Gashua with 2 Gujba 2 Damaturu and Potiskum 1 respondents each, 3% Air Pollution Gaidam having 6 respondents while Potiskum with 1 respondents, 11% waste disposal Damaturu with 20 respondents while Gujba 2 respondents, 4% water pollution Damaturu with 5 respondents and Gujba with 2 respondents, 2% flooding Damaturu having 4 respondents while potiskum having only 1 respondents, 2% erosion while Potiskum recorded 4 respondents Gujba and Gashua 1 respondents each Gaidam with 3 Damaturu with 2 respondents. Among them Damaturu is the

most affected by dry land while Gujba is the lowest, Damaturu experience high rate of casualty and potiskum with lowest, Damaturu having high rate of disease while Gujba with low, potiskum with high rate of hunger and Gashua with low rate, Gaidam with high rate of draught while Damaturu and potiskum with low rate, Gaidam with high rate of Air pollution while potiskum with low rate, Damaturu with high rate of waste Disposal while Gujba having low rate, Damaturu with high rate of water pollution and Gujba with low rate, Damaturu experience high rate of flooding while Potiskum with low rate, Potiskum with high rate of erosion while Gujba and Gashua having low rate. Based on the Responses the effect of Climate change and environmental degradation are not the same in all the five LGA's Damaturu, Gaidam, Gashua, Gujba and Potiskum but Damaturu is the most affected LGA by Climate change and environmental degradation in Yobe state while Gujba and Gashua are the least affected LGA's. Nigeria has a tropical climate with two precipitation regimes, low precipitation in the North and high precipitation in parts of the Southwest and Southeast. This can lead to drought, aridity and desertification in the northern part of the country, flooding and erosion in the Southern part of the country, (Akande *et al,* 2017; Nkechi *et al*., 2016). Analysis in the study area shows higher degrees of vulnerability to climate change and environmental degradation as shown in the figure above. This also assert that Vulnerability analysis demonstrates that states in the north experience higher degrees of vulnerability to climate change than those in the south (Madu, 2016; Federal Ministry of Environment, 2014).

Human Contributions

Figure (I) shows that Fifty three (53) out of the number of respondents indicate that burning of fossil fuels is one of the major problems we are facing, Out of it Damaturu recorded 27 respondents with the highest count while Gujba with 2 respondents, Humans activities contribute to climate change and environmental degradation because we depend on fossil fuels for our energy needs. Climate change happens because we are burning fossils and that increase gases such as CO_2, methane and some other gases in the atmosphere. Seventy six (76) Respondents also indicate that Greenhouse Emission has increased to an alarming rate in all the study areas Damaturu recorded the highest number of respondents with 30 respondents while Gujba with the lowest count 7 respondents therefore the industries, transportations and burning of fossil fuels for energy and agriculture is increasing in Damaturu and its environs. 119 of the respondents indicate that they experience increase in temperature while Gaidam having the highest number of respondents with a valid number of 42 respondents while potiskum recorded the lowest with 11 respondents, 83 respondents indicates rainfall out of which Gashua recorded the highest number of respondents with a valid number of 23 respondents while Damaturu and Potiskum with the lowest count of 11 respondents each. And 169 also indicate extreme weather out of which Damaturu count the highest number of 54 respondents followed by Potiskum with 45 respondents while Gujba recorded the lowest number of 16 respondents, with that Damaturu is the most affected LGA by burning of fusil fuel, green house emission and extreme whether this also contributes to climate change and Environmental Degradation in the study area, therefore with that Nigeria depends on fossil fuels such as coal and transportation. That makes it very difficult to stop using fossil fuels and switch to other alternative way of energy, because we solely depend on fossil fuels to large degree.



Source: Field Survey, 2022

Figure (J) Shows level of relationship with climate change issues and Environmental Degradation issues 17% of the respondents having a good and cordial relationship out of it Damaturu recorded the highest number with 25 respondents and Gujba with the lowest count 9 respondent, while 83% also respond badly and aggressive out of which Damaturu recorded with a highest and valid number of 201 respondents while Gashua recorded the lowest number of 23 respondents therefore the data indicate that level of relationship is relatively very bad as most people use the forest to cut down trees as their fuel wood without planting but this does not guarantee exposure as people tend to be selective on whether or not to make used of the forest resources. **Figure (K)** shows the major adaptation and mitigation strategies practiced by some few community members in the study areas, were multiple cropping. Though most of the people are not full time farmers, they are also engaged in part time farming majority of the respondents with a valid number of 119 indicate that Multiple cropping is the Adaptation and Mitigation Strategies adopted by most people out of which Gashua recorded the highest count of 45 respondents while Potiskum with lowest number of 6 respondents, 71 of the respondent also indicate that Adjusting Farming is also another way of Adopting climate change in the study areas which Potiskum recorded the highest number of 22 respondents and the lowest number is Damaturu with 0 respondents, while 133 respondents is the highest number of respondents that mention Irrigation farming contribute in adopting and mitigation of climate change with the highest number of 41 respondents in Gashua while lowest respondents from Damaturu with valid count of 10 respondents, 25 respondents mention Tree planting out of which Damaturu having the highest count of 13 respondent while Gujba having the lowest valid number of 1 respondent, 38 respondents mention Changing Cropping Gaidam having the highest count of 13 respondents while Gujba having the lowest number of 4 respondents, 111

of the respondents mention that they are doing nothing out of which Damaturu having the highest count of 32 respondents while Gaidam with the lowest number of 17 respondents, and 3 of the respondents suggested prayers is the only solution to adopt and mitigate the issues 2 respondents from Gaidam while 1 from Gujba. Therefore with that the indigenous people of Gashua L.G.A apply adaptation and mitigation measures to tackle the challenges of climate change and environmental degradations than the others study area.

Mitigation and Adaptation Strategies to Address the Impact of Climate

It can be seen from the above that the people of Yobe state of Nigeria are faced with myriads of environmental problems caused by Human activities, climate change and environmental degradations. Adaptation is learning to cope with the impacts of climate change as reported by Gwary, (2010). Adaptation in this regard, is the evolutionary process whereby population becomes better suited, to address the issue of climate change and promote sustainability in agriculture, health, environment, land degradation and many more. These depend largely on environment and any prolonged fluctuation in average weather can easily affect leaving organisms and Agricultural productivity. So therefore Tangible progress on implementation of strategies for adaptation and mitigation of the climate change, health, agriculture and environmental degradation sector need to be harnessed and pursue, there is need to employ skills and knowledge in order to reestablish climate change adaptation there is also a need to have awareness and access to knowledge of what climate change is, how it is impacting the community and how they can adapt it (BNRCC, 2011). It is important to train individuals in the state and equipped them with skills to address climate change risk and implement adaptation (Nkechi *et al.,* 2016). There is need to upgrade climate change knowledge among the people of Yobe State.

Adaptation knowledge:

Awareness on the importance of adaptation knowledge and its value for environmental management and sustainable development is also practice in some part of Damaturu, in order to improve adaptive practice and sustainable development in climate change adaptation and mitigation, adaptive knowledge should be documented.

Conclusion and Recommendation

Firstly, this study revealed that most of the people in the study area are aware of the climate change and environmental degradations the major adaptation strategies practiced by some few community members in the study areas were multiple cropping and irrigation farming among others. The climate change and environmental degradations are unfavorable factors in weather and environment; it also has an impact on human activities. Some of the effects are extreme weather, increase in temperature, rainfall and spread of disease. Secondly the study areas that are most affected by climate change and environmental degradation are Damaturu and Potiskum while the leased affected are Gujba Gashua and Gaidam local government areas of the state. These are the local governments that use local adaptation and mitigation strategies. Thus, based on the findings the study recommends that government should e*stablishment and implement laws and regulations,* in order to improve the system of policy adaptation and implementation based on the existing regulations on land use. It should create a policy on environment that promote the protection of land and pasture land and strictly control any redevelopment of land as well as promulgating and adopting laws to reduce

activities influencing climate change and environmental degradations. *Planting of crops, trees and fruits gardens according oasis region to local climate conditions for farmers to adapt to the impact of climate change, government should encouraged the farmers in warmer places to practice planting of crops frequently that can survive in their places. Government should encouraged and organized awareness campaign to the people on preventing aggravation of grassland desertification prevent further development of desertification by building artificial grassland, controlling grazing intensity, Strengthen the development of animal.* Government should in a more serious action implement strategies suggested in combating the impacts of climate change.

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