



Impact of Global Warming on Households in Zaria Local Government Area Kaduna State

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ABSTRACT

The study investigates the "Impact of Global Warming on Households in Zaria Local Government Area of Kaduna State". The objectives of the study are to determine the level of people's awareness and perception of global warming in the area, to determine the causal factors of global warming in the study area, to assess the socio-economic effect of global warming on household in the area and to identify measure to mitigating the effect of global warming in the area. Survey research design was used and population of the study was one hundred and forty one (140) respondents. The instrument for data collection was the questionnaire. The findings revealed human related respondents have knowledge on the global warming, that most of the casual factors of the global warming in the study area may include deforestation, air pollution, bush burning, urbanization, emission of greenhouse gases, over grazing and gas flaring among others. It was recommended that more emphasis on dissemination of global warming issues through the mass media is highly needed. Government should broadcast program to enlighten farmers and other individual on strategies to reduce factors that aggravate global warming and as well as showcase successful adaptation techniques adopted elsewhere that have local relevance and there is need for extension agents, policy makers and researchers to try and get farmers to effectively adapt to global warming. This can be achieved by providing free extension advice; information on early warning signals and improved farmer education to create proper awareness on global warming and effective adaptation processes that can be employed by farmers.

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INTRODUCTION

Global warming is the increase in temperature of the earth atmosphere which caused as a result of increase in the concentration of the greenhouse gases (Ibrahim, 2009). Global warming may be caused by the increase in the atmosphere carbon dioxide which is a greenhouse gas responsible for about half of the atmospheric heat retained by trace gases and also for 50% of the greenhouse effect. The rate and duration of the warming of the 20th century is larger than any other time during the last 1,000 years. the 1990^s

are likely to have been the warmest decade of the millennium in the northern hemisphere and 1998 is likely to have been the warmest year (Houghton et al, 2001)

According to Michael (2007) Greenhouse gases retain the radiant energy (heat) provided the earth by the sun in a process known as the insolation greenhouse gases occur naturally and without then the planet will be too cold to sustain the life. Global warming poses one of the most serious threat to the global warming will not only be felt many decades from now. it is already

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happening and its impacts are clearly by visible. the emission of carbon monoxide, nitrogen oxide, and volatile organic compound, among other species in addition to the change in the greenhouse gases (Noammohr, 2005).

Scientist believe earths is currently facing a period of rapid warming brought by rising level of heat trapping gases, known as greenhouse gases, in the atmosphere (mastrandrea,2007). Human have been emitting extra greenhouse gases which are the result of burning fossil fuel (like coal, oil and gas). In the next 100year carbon dioxide produced by man will cause a lot of more warming from as low as the degrees c to as high as 8 or 10 degree c : Human caused global warming may have already doubled the change of " kuller " heat wave like the one that scorched Europe in July – August 2003. Strong evidence indicates that the summer was the hottest in Europe in at least the past 500 year (Luterbacher et al, 2004).

According to Haviland and William (2003) House hold consist of one or several persons who like in the same divelling and share meals. It may also consist of a single family or another group of people it is the basic unit of analysis in many social micro economic and government model and is important to economic and inheritance. Peseran et al (2004) also opined that households' members other than members of the nuclear family, such as more distant relatives, friend foster- children, lodger's flat mates or long – stay guest or visitors. For much of the twentieth century, census data for example, did not distinguish sharply between house, hold and family, although the extinction has been much sharper since 1961, and usually now made in major sunset

According to Romero (2013) the impact of global warming on human and natural system are expected to be substantial a pledge was made in the Paris warming agreement to keep global temperature rise below 1.5^{0c} above pre – industrial levels. To address this challenge, much research has been devoted to identifying what different stake holders including public and private actors, can do to tackle the crises and reduce the risks and collaborative efforts across all scale are needed including small – scale actors like house

hold. Householder are a fundamental unit of analysis therefore they have become increasingly visible in climate research households have two man responses to address global warming. The first is through mitigation of greenhouse gases emission. Household consumption Creates significant environmental impact, contributing more than 60% of word wide green hold gas emission and 50% to 80% of total resources use therefore substantial emission reduction can be archived by modifying household behavior, the second response is through adaption. Household are considered to be vulnerable to a changing climate due to their exposure to climate event however households have the opportunity to manage the risk and opportunities posed.

According to the report of wood (2004) and the environmental health committee (2004), and have reached a worrisome level. Exhaustion from all combustion engine which contain these pollutants has adverse effect on the health status of the populace which in turn also effects their productivity adversely. taking it to the large environment, the combustion engines contribute to carbon dioxide accumulation in the atmosphere and are responsible for global warming (gulason 2006) transmission of air pollution such as carbon dioxide and methane which as greenhouse gas play notable roll in global warming as there shut in heat without returning theme as treed or thermal radiation there by contributing to the imaging global hazard.

Concerning the impact of global warming on indigenous communities, their traditional knowledge and biological diversity was also expressed at the annual meeting of the interagency sport group on indigenous issue (IASG) in Montreal in September 2007 (Adamu 2008).The IASG highlighted the fact "that indigenous people are often amount the world most marginalized and improvised poor peoples and will bear the burnt of the catastrophe of climate change and as such provide a human face to the climate change crises" they pointed out that " the most advanced scientific research has conclude the changes in climate will gravelly harm the health of indigenous peoples traditional lands and waters and that many of plants and animals



upon which they depend for survival will be treated by the immediate impacts of global warming. It was felt that such conclusion requires urgent and unprecedented efforts and interventions from the global community (Kule, 2010).

Despite the fact that these changes are impacting intensely on indigenous peoples and their community, they are very rarely considered in public discourse on global warming. Indigenous people are vital to, and active in, the many ecosystems that inhabit their lands and territory and therefore, in a position to help enhance the resilience of these ecosystems. (Health, 2010). In conclusion, indigenous people interpret and react to global warming impacts in creative ways, drawing on traditional knowledge and other technologies to find solutions, which may help society at large to cope with pending changes.

STATEMENT OF THE PROBLEM

Global warming is acting on our planet in a new and unexpected way by triggering earthquakes, tsunamis, volcanoes and volcanic eruptions etc. (Romero, 2013). Human activities have contributed to a number of the observed warming and change in climate; this contribution has principally been through the burning of fossil fuels which has led to the direction of warming. Human-induced forcing of the climate has highly contributed to a number of observed changes including sea level rise, change in climate extremes, (such as warm and cold days), decline in Arctic sea ice extent and to glaciers retreat (Hegerl et al., 2007).

According to both (2018), the common uses of wood for bioenergy resulted in increases of carbon dioxide (CO_2) in the atmosphere depending on fuel source and alternative fate of burned materials. Increased demand for woody biomass for fuel has raised concerns and produced conflicting statements about how to assess impacts on greenhouse gases used by households which mostly use traditional wood burning incompletely, leading to the emission of pollutants such as carbon monoxide, methane and nitrogen oxide. They also contribute to greenhouse gases with one.

Jensen, Overpeck et al. (2007). The effect of global warming may be physical, ecological, social or economic. Evidence of obscene global warming includes the industrial temperature rise, rising sea level and decreased snow cover in the Northern Hemisphere.

According to the Intergovernmental Panel on Climate Change (IPCC) (2004) (most of the observed increase in global average temperature since the mid-20th century is very likely due to the observed increase in (human greenhouse gas). Contribution of it is predicted that future climate change will include further global warming (i.e. an upward trend in global mean temperature). The IPCC fourth assessment report published in 2007. Revealed that serious environmental issues like global warming are related to the use of fossil fuel. Wood emits carbon dioxide which is being released naturally, but trees absorb carbon from the atmosphere through photosynthesis. Natural decomposition also emits methane, which doesn't occur when the wood is burned completely, so from an environmental point of view, burning wood residue for logging and processing is beneficial. In addition, wood fuel does not emit SO_2 unlike coal and oil, most wood fuel in Asia is used by households which mostly use traditional stoves. Schneider et al. (2007).

Available evidence shows that there are few researches on the impact of global warming on households in that area. For example, Santosh (2016) on households' economy and adaptive response in agricultural households' economy and coast of India. The study used primary data from 150 households; the result implies that access to climate change.

Another research was conducted by Adisu (2020) on global warming impacts on household food security and adaptation strategies in southern Ethiopia. The data collected were analyzed using descriptive and inferential statistics. Climate change over the last few decades was found to have a negative impact on food security status of households. Another research was conducted by Shinkafi (2014) on the potential impact of global warming on fisheries and agriculture in Nigeria. The study discovered that elevated water temperature affects



physiological process there by affecting spawning, survival of the juveniles, population size, production and yield.

From the fore going previous research above such as Santosh (2016), Adisu (2020) and Shinkafi (2014) used empirical research design and they focus on "impact of climate change on food security, House hold economy fisheries and aquaculture which were conduct at international level whose funding cannot be use for local area like the study area. this study used suncery research design to fill the existing gap in knowledge and to assess the impact of global warming on households.

The questions which the researcher seeks to answer includes:

1. What is the level of people awareness and perception to global warming?
2. What are the causal factors of global warming in the study area?
3. What are the socio – economic effects of global warming in the study area?
4. What are the measures taking to mitigate the problem of global warming in the study area?

Aim and Objectives of the Study

The aim of the study is to determine the impacts of global warming of households in Zaria L.G.A

1. Assess the level of people's awareness and perception of global warming in the area
2. Determine the causal factors of global warming in the study area
3. Assess the socio- economic effect of global warming on household in the area.
4. Identify measure to mitigating the effect of global warming in the area.

Scope of the Study

The study in terms of content focus on the level of awareness cause the socio-economic effect and measure to mitigation the surge of global warming in the study area. The spatial scope of the study is limited to the ward of Gyallesu, Tudun Wada, and Tudun Jukun, Zaria

city e.t.c the socio economic activities affected by global warming include farming, wood /fire wood collection, fishing, pretty trading civil service, craft e.t.c and research lovers the period of one year from 2020 to 2021

Significance of the Study

The study will be immensely significant to individual household in the area and in other areas with similar climate condition. The great effect of global warming to their life and environmental and non – governmental agency, the findings of this study will helps to creat awareness on the effect of global warming to the general public this study also help to determine feature climate expectation. It is important to understand how to climate is changing, so that we can prepare for the feature.

Global warming affect nearly every aspect of our life through changing of limnetic element it affects our food source, transport infrastructures, cloth we wear etc and so it has a huge effect on our livelihood, health and our feature and so feature and so the findings of these study will go along way to help us to understand the impact of global warming and to provide a possible solution to the it effect in Zaria and the world at large

Conceptual Framework

The conceptual framework of this study centre on concept of global warming. Greenhouse effect, households and warming and temperature.

CONCEPT OF GLOBAL WARMING

Global warming is the long-term heating of earth's climate system observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping, greenhouse gas levels in earth's atmosphere. The term is frequently used interchangeably with the term climate change, though the latter refers to the both human and naturally produced warming and the effect has on our planet. It is most commonly measured as the average increase in earth's global surface temperature (Oguntoke and Adeyemi, 2007).



Global warming is the phenomenon of increasing average air temperature near the surface of earth over the past one to two centuries. Climate scientists have since the mid-20th century gathered detailed observation of various weather phenomenon (such as temperature, precipitation, and storms) and of related influences on climate (such as ocean current and the atmosphere's chemical composition). These data indicate that earth's climate has changed over almost every conceivable time scale since beginning of geologic time and that of human activities since at least the beginning of the industrial revolution has been deeply work in to every fabric of global warming (Report of wood, 2004).

Global warming is the increase of average world temperature leading to what is known as the greenhouse gas effect contain in the atmosphere act like glass in a greenhouse, allowing sunlight through to heat the earth's surface but trapping the heat as it radiate back into space. As the green greenhouse gases build up in the atmosphere the earths get hotter. This process is leading to a rapid change in climate also known as climate change (Gislason, 2006).

Global warning occurs when carbon dioxide (CO₂) and other air pollutants collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. Normally this radiation would escape into space, but these pollutants, which can last for years to centuries in the atmosphere, trap the heat and cause the planet to get hotter. These heat-trapping pollutants, specifically carbon dioxide, methane, nitrous oxide, water vapour and synthetic fluonated gases are known as greenhouse gases, and their impact is called greenhouse effect (NASA, 2005).

Concept of Greenhouse Gases

According to Sharma (2011) greenhouse gas, any gas that has the property of absorbing infrared radiation (net heat energy) emitted from earth's surface and reradiating it back to earth's surface, thus contributing to greenhouse effect carbon dioxide, methane, and water vapour are the most important greenhouse gases. (To a lesser extent, surface level ozone,

nitrous oxides, and fluorinated gases also trap infrared radiation). Greenhouse gases have a profound effect on the energy budget of the earth system despite making up only a fraction of all atmospheric gases. Concentrations of greenhouse gases have varied substantially during earth's history, and these variations has driven substantial climate changes at a wide range of timescale in general greenhouse gas concentrations have been particularly high during warm period and low during cold periods.

According to Osobohien, (2017). Greenhouse gases are gases in earth's atmosphere that trap heat. They let sunlight pass through the atmosphere, but they prevent the heat that the sunlight brings from leaving the atmosphere. The main greenhouse gases are water vapour, carbondioxide. Greenhouse gases are those constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths the spectrum of infrared radiation emitted by the earth's surface, the atmosphere and clouds (Ahmed and Hassan, 2016).

Concept of Greenhouse Effect

This is the process by which radiative energy leaving a planetary surface is absorbed by some atmospheric gases called greenhouse gases. The sun is earths only external form of heat. It emits solar radiation mainly in the form of heat shortwave travels visible and ultraviolet (UV) energy. As this radiation travels towards the earth, about 25% of the radiated energy is absorbed by the atmosphere about 25% is reflected by the clouds and other gases back into space. The remaining radiation travels unimpeded to the earths and heats it surface the atmosphere acts like the glass in a glass greenhouse allowing much of the shortwaves solar radiation to travel through unimpeded, but trapping a lot of the long wave heat energy trying to escape back to space. The greenhouse gases transfer to energy to the surface and lower atmosphere and it is reradiated in all direction, including down towards the earth's surface. This process makes the temperature rise in the atmosphere just as it does in the artificial greenhouse (Paechler, 2007).



Concept of House Hold

According to Yusuf (2011), Define household as a comprises of one person living alone or a group of people, who may not be related, living (or staying temporary) at the same address, with common housekeeping, who either share at least one meal a day or share common living accommodation (i.e a living room or sitting room) Resident domestic servants are included. Members of household are not necessarily related by blood or marriage Perasan etal (2004) also opined that households may contain one or two or more nuclear families within them but also household members other than members of the nuclear family, such as more distant relatives, friends foster – children, lodgers, flatmates or long – stay guests or visitors. For much of the twentieth century. Census data for example, did not distinguish sharply between household and family, although the distinction has been much sharper since 1961, and is usually now made in major survey

According to Grosh (2000), citing a united nations study, note, “For the purpose of conducting a household survey the standard definition of a household is a group of people who live together, pool their money, and eat at least on meal together each day” Nevertheless, they remark in a footnote that sufficient flexibility should be incorporated in the definition to adapt to local context.

REVIEW OF LITERATURE

Causes of Global Warming

There are a number of causes of global warming including man-made causes. Understanding all causes and its impacts on societies and ecosystems are imperative in developing polities related to reducing our vulnerabilities to extreme weather and climate variation. Human and natural causes are driven of global warming which result in temperature and rainfall variability. All these ultimately lead to global warming. Anthropogenic theory and climate simulations models suggests that global warming might lead to an increase in either the frequency or intensity of extreme weather event s such as

hurricane, heat waves, storms and droughts (Oreskes and Conway, 2008).

According to Khandekar Etal (2005), Supplement that global warming lead to the increasing mean temperature of the earth, associated with extreme weather events such as melting of the polar ice caps, and the related phenomenon of rising global sea levels. All these result in famine starvation, population displacement / migration and political changes which many developing countries are experiencing. From the discussions, it can be conclude that the links between the causes and consequences of global warming are highly contested. Hence it could be the right time for the writer to examine such controversial issues and draw some conclusions and suggestion for the battlement of our planet. This means that, the urgency in addressing in global warming should be prioritized because it can hinder wider human development efforts and bring global political chaos (system et al., 2008).

Human causes according to Paehler (2007), The global is changing due to man-made greenhouse gases from burning fossil fuels for electricity, cars, trains, air crafts, homes flaring of gas at the oil field like in Nigeria Et cetera furthermore, Land – use and deforestation add pressure to greenhouse gases. Scientists believe humans activities contribute to global warming because we depend on fossil fuels for our energy needs, a large amount of global warming happens widely because we are burning fossil fuels and that increase gases such as carbon dioxide, methane and some other gases in the atmosphere. According to the Australian greenhouse office, the world depends on fossil fuels such as oil coal, and natural gas for 80% of its energy needs. Natural causes: - The earth's climate is grossly in influenced and changed through natural causes such as oceans current, volcanic eruption, the earth's orbital change and solar variation (Brown 2010).

Effects Of Global Warming on House Holds

Depletion of resources and change in climate condition remains as the major environmental challenges globally (Inter



governmental panel on climate change, [IPCC] 2007). But the effects of these challenges and susceptibility to these challenges however, are not the same across regions of the world. Some continents of the world (IPCC, 2007) Mesagan and Ekundayo, 2015). For instance, it is feared that Africa and indeed Nigeria, may have most insensitive impact of climate change than other region and indeed countries of the world and it is also the continents that is least prepared to handle these impact (Terr – africa 2004: world bank, 2010). Evidence have shown from literature that emission of greenhouse gases (GHG) like CO_2 and SO_2 are two main sources of global warming and their impacts are increasingly daily due to human activities (Botkin and Keller, 1997).

People's activities as a result of the combustion of fossil fuels, cement manufacturing and land use for agriculture purposes causes of carbon dioxide emissions which are basically gaseous substances (IPCC, 2007). Globally, there has been a serious concern about the cumulative increase level emission of gas which are been trapped into the atmosphere (Anderson et al. (2008) and Alege et al (2017) using the VAR approach opined that GHGE have been on the increase since the industrial revolution. One of the dangers posed by these GHGE is that it is results to the climatic changes, and this affects the environment negatively as well as hinders both human and economic activities adversely. Behera Et al, (2017); Jiang and li (2017) opined that increased emissions of GHGE threaten an economy because they can bring about a mess ice decline in agricultural output.

According to Oguntoke and Adeyemi, (2017), The adverse effect of gas emissions on human are quite all encompassing (NPI, 2006). Specifically, the pollutants have known adverse effects on human health especially children, who are most susceptible age group due to their peculiarities. Ozone, sulphur dioxide, nitrogen dioxide gaseous substances can cause an increase in respiratory tract illness, asthma attacks and a reduction in the functioning of the lung. In some communities, breathing and circulation hospitalization, cardiac death and even cancer of the lung are attributed to unpleasant

repercussions of air pollution. When the level of concentration of nitrogen dioxide (NO_2) is high, it can cause serious lung damage which results in shortness of breath and chest pain (Oguntoke and Adeyemi, 2017). Methane as an asphyxia is known to displace oxygen, and when the displacement is 18%, asphyxia can result in exposed person.

Level of GHGE into the atmosphere (which include carbon dioxide (CO_2) level have been associated with increase in climate change, a land hence expert have suggested lately on how to tackle climate change, which has to do with gradually reducing emission of G H G, for instance community to the reduction of gaseous emotion to 5% below 1990 points under the change categorize respond to global warming in to main folds, secondly, by adjusting the effect of global warming on heath. Many of the UNFCCC and the Kyoto protocol. These continues went ahead to adopt national policies and took equitant measures on the alleviation of global warming and reduce their overall GHGE (Protocol 1997; Klein et al, 2007).

Global Perspective of Global Warming

According to Pelham, Brett (2009) between 2007- 2010 the Gallup world poll surveyed individual in 143 countries. This poll queried whether the respondent knew of global warming. Those who had a basic concept of global warming didn't necessary conned it to human activities revealing that knowledge of global warming and the knowledge of that its human – induced are two separate things. Over a third of the world world's population were unaware. Of global warming. Developments cautious have less awareness. Then development and Africa, parts of Asia and the middle fast and a few countries from the former Soviet Union led in the opposite. Opinion with in the United Kingdom was divided

The first major worldwide poll, conducted by Gallup in 2008 – 2009 in 127 countries, found that some 62% of people worldwide said they knew about global warming. In the industrialized countries of North America Europe, and Japan, 67% or more knew about it (97% in the U.S 99% in Japan); In developing countries, especially in



Africa power than a quarter knew about it, although many had noticed local weather change. The survey results suggest that between 2007 and 2010, only 42% of the world's population were aware of global warming and believed that it is caused by human activity. Among those who knew about global warming, there was a wide variation between nations in behalf, that the warming was a result of human activities (Petham. Brett 2009)

According to LeviSebasian (2021) Adults in Asia with the exception of those in developed country are the least likely to perceive global warming as threat in development Asia countries like south Korea, perception of global warming are associated with strong emotional behalf about it causes Brittany (2015) in the western world, individual are the most likely to be aware and perceive it as a very or somewhat serious threat to themselves and their families, although, Europeans are more concerned about global change than those in the united states. (Thomas 2017)

The public in Africa, where individuals are most vulnerable to global warming while producing the least carbon dioxide is the least aware – which translates into a low perception that it is threat (Ray, Julie 2009) these venations pose a challenge to policy makers as different countries travel down different paths making an agreement over an appropriate response difficult. While Africa may be most vulnerable and produce the least amount of greenhouse gases, they are the most ambivalent. The top five emitter China, the United States, India, Russia and Japan are the most aware at over 85% of the population. Conversely, only two thirds of people in China and one thirty in India are aware Japan expresses the greatest concern, which translates into support for environmental policies. People in China and Russia and the United States, while varying in awareness, have expressed a similar proportion, concerned, but India faces challenges spreading this concerned, to be remaining population as its energy need increase over the next decade (Ray Jullie 2009)

An online survey on environment question conducted in 20 countries by IPOS MORL, "Global trends 2014" shows broad agreement, especially

on global warming and if it caused by humans though the U.S ranking is tried to denial campaigns A 2010 Survey of 14 industrialized countries found that skepticism about the danger of global warming was highest in Australia, Norway, New Zealand and the united states in that order correlating positively with per capital emissions of carbon dioxide (Booth, Kate 2015)

Evidence of Global Warming in Nigeria

Evidence of global warming in Nigeria Developing countries like Nigeria are least prepared for the impact of global warming. Global warming is real and evidence abounds in the count. Global warming is reality. Therefore, the nation should be proactive in her response to the phenomenon and its challenges and should not wait until much damage is done which will be very costly to correct. Developing nations like Nigeria should not fold their arms and waits for international donor agencies and research institutes to provide wholesale solution to global warming issues. They must take ups the challenge and seek much damage is done which will be very costly to correct. Developing nations Nigeria should not fold their arms and waits for international donor agencies and research institutes to provide wholesale solutions their global warming issues. They must take up the challenge and seek co-operation and collaboration with international agencies in other to create opportunities for technology transfer (Holdren, 2010).

Although the country has been lucky not to have experienced major global warming .Induced natural disasters, the effect of global warming is evidenced by rise in sea level and erosion along the nations, coast line, the weather pattern is no longer distinct in the country, there is witnessed of very hot weather conditions and high precipitations leading to flooding which rained crops in parts of the country creating food security, the latest being, Jigawa state (Adeyinka 2005); gully erosion has sacked in any communities especially in Edo and Anambra state, as a result persistent drought, the lake chad has almost dried up, while there had been persistent desert encroachment in the north (Holdren 2010). The

death of statistical data and non – collection environment al data in a systematic manner make it difficult to estimate in concrete terms the overall effect of global warming on agriculture and food supply, flooding and erosion, health risks disease, and their effect on the social and economic system of the country (Adeyinka 2005). A comprehensive audit of the environment is needed to quantify the effects of global warming and the level of degradation and loss of biodiversity, so we can start to put in place some mechanism for responding to these challenges (Holdren, 2010).

Conflict over the use of water resources among different economic sector has adversely affected the hydropower plants in kanji, Jebba and Shiroro which is the key to the security of electricity supply in the country and represent about one – third of the country's total installed electricity generating capacity. This also indicates the evidence of global warming in Nigeria. These plants have produced significantly lower energy leading to epileptic power supply as a result of excessive drought that lead to vapor transpiration affecting water volume and the capacity of power plants to produce optimally.

Incessant power outage the cost of doing business and hampers the pace of industrialization in the country (Holdren, 2010), industries that are dependent on climate sensitive resources or condition e.g. agro business construction, infrastructure, transportation, pollution, control are potentially vulnerable to changes in the climate. Conflicts with indigenous people relating to their displacement changes to their natural habitat (deforestation, pollution, degradation, etc.) and influences on their ancestral customs and modes of economic production. Conflict may also demand greater participation in decisions that affect the population directly (Volpe and Rossi, 2005).

Global Efforts in Mitigating Global Warming

This means that the measure must be taken by various nations to reduce rate and magnitude of global warming caused by human activities. According to IPCC (2006) the mitigation options includes reduction in burning of fossil fuels and reduction of greenhouse gases and soot from

the energy sector, reduction of deforestation, increases in a reforestation and afforestation modification of agricultural practice to reduction emission of greenhouse gases and build up soil carbon. Other mitigation according to Dayo (2001) includes geo – engineering to reverse the effect of global warming by creating cooling effect which will offset greenhouse gases from the atmosphere. It has been estimated that at present cost and benefit of mitigating global warming are approximately the same.

In general, the IPCC (2006) concludes without mitigating global warming will reach a point where it will be impossible for some natural systems such as ecosystem to cope and therefore may go into extinction. As for humans the cost of adaptation will be so prohibition that many will not cope. It is therefore essential to do a little of mitigation and a little of adaptation. Adaptation means that we should take measures to reduce the adverse impact of global warming on human life and the environment. Some of the options that are available includes: changing the cropping patterns stopping further development on wetland, flood plains and close to sea level: Developing crops that are resistant to drought heat and salt; strengthening public health and environmental engineering defense against diseases; designing and building new water projects for flood control and drought management; construction of dykes and storms surge barrier against sea level rise. (Holdren, 2010).

METHODOLOGY

The Study Area

The study area presents the location, geology, geomorphology, relief and drainage population and settlement, socio – economic and cultural condition.

Location and Size

Zaria lies on the high plains of Northern Nigeria between Latitude $10^{\circ} 55'N$ to $11^{\circ} 15'N$ of the equator and Longitude $7^{\circ} 50'E$ of the GMT (Fig.3.1). It is at an altitude of about 670m above sea level. The early history of house land is shrouded in the legend of an ancient king doms (Hausa Bakwai). Zaria L.G.A Share its north

eastern and eastern border with Kudan L.G.A and to the North Western border is Makarfi L.G.A to the south with Sabon Gari L.G.A and to the south west is Giwa L.G.A of Kaduna state (KUCPA, 2012). The core of the kingdom was surrounded by rock outcrops rising abruptly several hundred meters above the country side (Idris, 2004) and fortified by high city walls and gates (KOFA, 2010).

The urban area of Zaria is made up of Zaria city surrounded by a huge old wall called Ganuwar Amina. The colonial towns of Sabon–Gari, Tudun Wada, Samaru and many of her sub settlements which have grown over the year are the other areas. Tudun – Wada, Gyallesu, Wusasa, Tukur – Tukur and Saye are fully Hausa / Fulani dominant areas.

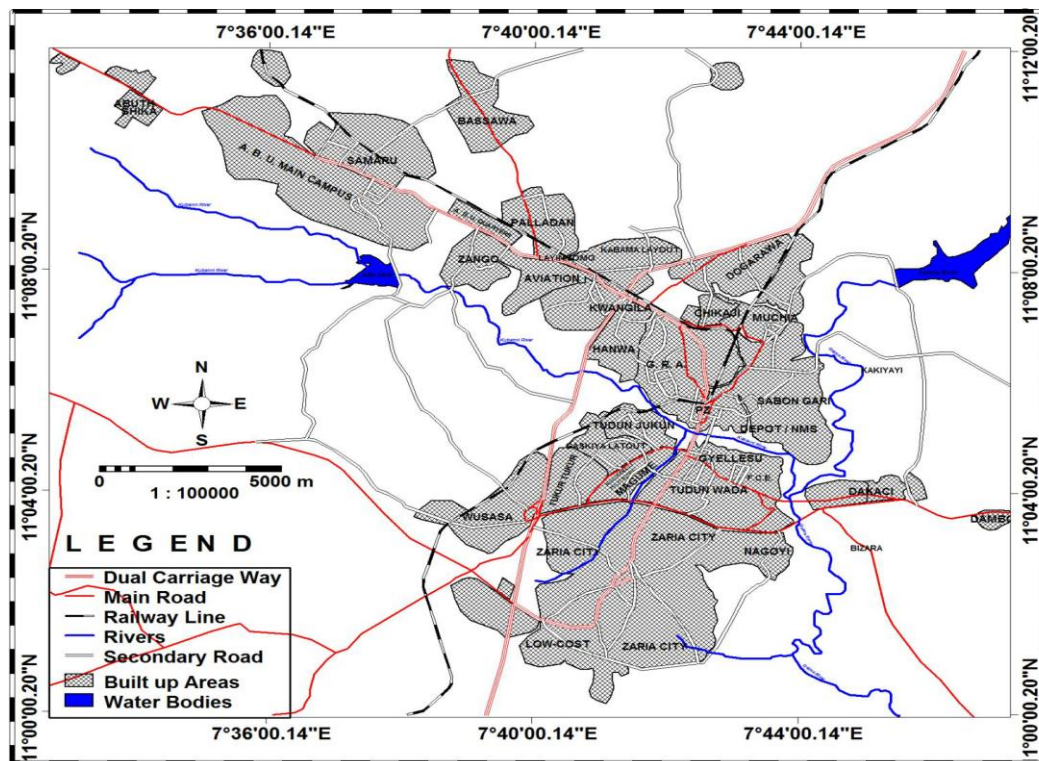


Fig. 3.1 Study Area Showing Selected Area
Source: Modified from Administrative Map of Kaduna state

Climate

The climate of the Zaria is dominated by seasonal shifting of pressure belts. The continental air mass blows south wards from the north east from November to march, during the harmattan sea while the tropical man time air mass blows north wards from the south west in way to September to create the rainy season, this developing monsoon characteristics during the northern Nigeria summer. Schwedt Ferger (2007)

observed that the local people distinguish four seasons as follows:

1. Bazara (hot and dry) ; Mid – February to mid- may the hot dry season of the harmattan
2. Damina (wet) : mid – may to the end of September the rainy season;
3. Kaka (dry) : October to mid – December, the harvest season, and
4. Rani (cold and dry) : mid – December, to mid – February, the cold dry season of harmattan.

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According to Hare (2001) Zaria has a tropical continental climate, which suggested by its latitudinal and continental location. The highest temperature do not coincide with the period of the highest sun which is June but occurs just before the onset of the rainy season in March / April. The mean daily maximum temperature shows a peak in April and October while mean maximum temperature is less in December / January due to the influence of cloud cover and cooler atmosphere. The total annual rainfall in the region is about 120cm. This low and seasonal character of rainfall make mark on the vegetation of the area which assumes various shades of green in the wet season and turns brownish or yellowish in dry season.

Relief Geology

The bedrock geology is predominantly metamorphic rocks of the Nigeria basement complex consisting of biotite gneisses and older granite. In the south eastern corner, younger granites and batholiths are evident. Deep chemical weathering and fluvial erosion influenced by the bioclimatic natural high undulating plains with subdued interfluvies (Wright, 2020). Also in lateritic ironstone especially in the northwest.

However, rocky granitic residual from inselbergs of varying sizes and shapes, and constitute the main local relief (relative relief is less than 150m) here and there with Kufena, Kagoro hills and Dusten – Wai Kaduna ring complex standing out very prominently. The valleys are shallow but wide, striding several tens of kilometers in to the headwater area of with sloping valley side; imperceptibly grading in to most to marshy alleviated bottom lands earn valley incisions and dissection of the high plains are evident in several areas, especially in Zaria region (Smith, 2010).

Drainage

Zaria area is basically drained by the Galma River being a major tributary of the river Kaduna, the Kubanni and Saye rivers. These rivers are characterized by high stream frequency and drainage densities. The Kubani rivers passed through the study area and its source is from the

Funtua water shed. The river Galma forms the main focus of the drainage stream in Zaria. Although the Galma carries water throughout the year, most of its tributaries such as the river Samaru dry up between January and June, the valleys of the stream to the north of Zaria are generally wide, shallow and not in use. The valley bottoms are alleviated and are singularly flat, wide and level. The soil in Samaru between 36cm and 119cm (Mortimore, 2010).

Soil and Vegetation

The main soil type of Zaria is the red soil as well as the heavier and more blackish soil. The laterite soils are shallow and of low medium fertility. The main feature is the accumulation of clay between a depth of 36cm and of 119cm (Klinkenberg 1970) cited by Sadiq (2010) there is evidence of down – wards movement of clay. The clay soils that are in the river valleys are formed from alluvial materials. They are less porous, and are called fadamas. The fadamas are of special importance. They are fairly rich in nutrients and have a good retention to excessive water supply which persists in the dry season. Many parts of Fadamas are therefore, used for the cultivation of Sugar cane, rice etc and during the dry season for vegetable Farming, usually called dry season farming (WINKENBERG 1970) cited by Sadiq (2010)

The relatively deep tropical ferruginous soils and climate conditions of Zaria are suitable for and sustain a good cover of savanna woodland (northern guinea savanna) with a variety of grasses, woody shrubs and short trees. However, increase in human population with its concomitant demands for grazing, subsistence cultivation, fuel – wood, and poor land management. Consequently, new plant communities are developing around the township and the densely nested villages of Zaria the present vegetation may this be described as parkland with annual grasses /shrubby cover interspersed with tree of special food and economic value such as shea butter tree (Jackson 1970) cited by Sadiq (2010).



People and Socio-Economic Activities

Zaria urban has increase in its population cover the years. At present, it is next only to the state capital based on the most recent population Zaria and Sabon – Gari local government. Area has a total population of 695,069 (federal republic of Nigeria (2007). This is quite increase when compared with about 110,000 population in 1970. urban Zaria being the study area a comprises manly the Hausa / Fulani as indigence and many other ethnic groups. The indigenes predominantly practice of restricting women at home and mostly at night. Family setting of the area are of two types a simple unit (nuclear family) consisting of married adult, his wife or wives and children, and a composite unit (extended family). Also known as economic unit, consisting of two or more male adults, usually married staying together in a compound setting in some cases they co-operate to secure income from the farm. In this complex unit members are ranked in order of decision-making power and subordinate having minor right while basic education are taken by the head of unit (Nwachokwu, 1990).

CONCLUSION

Based on the objectives of this study it was concluded that, farmers observed elements of global warming in the study area. Respondents refer to the global warming currently experienced as, bad compared to what was experienced 15 years ago or more in the study area. This finding is similar to the Kenyan study conducted by Ogalleh *et al.*, (2012). Also, respondents have observed increased temperature, incessant rainfall, dry spells during rainy season etc.

Impact assessment conducted reveals that farmers and individual are moderately aware to the impact of global warming. Given that the study area is an urban area and level of development is high, which makes the community quite to the impact of global warming. Various adaptive measures are being employed by the farmers. These include planting of drought tolerant crops, mulching of crops to reduce water loss, increase in the use of organic manure and planting of different varieties of crops amongst others. The

problems of climate change are already evident. Therefore, all should be done to properly address this issue for self-sufficiency in food production and for export, thereby enhancing virile economy.

RECOMMENDATIONS

Base on the findings from the study, the following recommendations are made:

More emphasis on dissemination of global warming issues through the mass media is highly needed. Government should broadcast programmes to enlighten farmers and other individual on strategies to reduce factors that aggravate global warming and as well as showcase successful adaptation techniques adopted elsewhere that have local relevance.

Also, there is need for extension agents, policy makers and researchers to try and get farmers to effectively adapt to global warming. This can be achieved by providing free extension advice; information on early warning signals and improved farmer education to create proper awareness on global warming and effective adaptation processes that can be employed by farmers.

There is need for Zaria local government council to partner with multilateral and international agencies to build capacities of farmers and others individuals in relevant areas so as to strengthen the ability to develop and implement adaptation strategies and plans that would reduce her the impacts of global warming. Some of these areas include, providing financial resources which will increase their ability to adopt crop, water and soil management strategies in response to global warming. Also, there is a need for international agencies, researchers and extension agents to provide programs such as female cooperative groups that support female from being extremely to global warming.

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