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Basic Education is Fundamental to Climate Change Adaptation in Dryland Communities: Case Study of Kabobi Village of Katsina State, Nigeria

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Abstract

In spite of global commitments to universal basic education, numerous objectives of such universal initiatives have not been achieved yet in many developing countries. Among such objectives that are rarely achieved through basic education is environmental education and notably climate change which our respondents in Kabobi Village of Katsina State showed less knowledge of. The aim of the study was to examine the role of basic education on climate change adaptation in the area. For that purpose, a list consisting of 102 respondents who possess basic education in the area as in National Policy on Education 2004 was compiled by a local resident who was employed as field assistant. The respondents were stratified based on their levels of basic education i.e non-formal literacy, primary and junior secondary levels as classified in the National Policy on Education. The respondents were served with questionnaires of 15 semi structured questions. Considering their different levels of basic education, knowledge of climate change and adaptation were obtained and processed and the results varied markedly. Result of the study indicated that about 67% of the respondents possess non formal education. These results suggest that basic education is key to climate change adaptation in developing countries such as Nigeria as virtually most adaptive strategies are age long insufficient ones that should be revised through education. The study therefore recommended that similar studies of climate change education should be sponsored so as to have vast knowledge on the concept and how it is perceived by the local people for target interventions and empowerment. This can be achieved through enhanced linkages among government agencies, tertiary institutions, research institutions, and financial houses, international as well as community stake holders.

Keywords

Basic Education, Climate Change Adaptation, Drylands, Kabobi Village, Nigeria

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1. Introduction

Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer (IPCC, 2014). Despite few skeptical views, (e.g Frank, 2008; Washington and Cook, 2011), there exists a widespread consensus among scientists that climate change is happening and is being driven by the unsustainable practices of mankind, especially the burning of fossil fuels, industrial pollution, deforestation, and land use changes (IPCC, 2007). Global attention on climate change was sort for the first time by the Brundtland Report, *Our Common Future*, which stated that the unsustainable development practices of humankind have pushed the world's climate to a warming trend (UNWCED, 1987). Climate change may be experienced as increased variability in temperature and precipitation, with an associated elevated incidence of extreme events such as drought and flooding (IPCC, 2007). Climate change is a reality (Boureima, 2013) and global climate change scenarios strongly suggest that drylands in West Africa are likely to

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become more arid (Cooper et al., 2008). In these areas for example, several global circulation models predict an increase in temperature, a decrease in rainfall and an increase in rainfall variability this century (Dobie, 2003).

Although authoritative statement regarding climate change was made by *Our Common Future,* public concern on the phenomena was nevertheless triggered by the unusual northern hemisphere heat wave and drought of the summer of 1988 (Christianson, 1999). However, in its Fourth Assessment Report, the Intergovernmental Panel on Climate Change (IPCC) stated with 'very high confidence' that human activities since 1750 have caused global warming and for the next two decades, says the IPCC, about 0.2 °C of warming per decade is projected. Among the 'many hard hitting effects', sea levels are expected to rise more than 50 centimetres by 2100. It is also likely that some 20 to 30 per cent of plant and animal species assessed will be at greater risk of extinction if the rise in global average temperatures exceeds 2-3 °C (IPCC, 2007). Climate change is a key causative factor in increased heat waves, flooding, droughts, intense tropical cyclones, rising sea levels and loss of biodiversity (Hulme, 2001).

Available evidences show that climate change will continue at global scale. Climate change will impacts all parts of the world, but the biting effects will be felt more by the developing countries, especially those in Africa, due to their low level of coping capabilities (IPCC, 2007; Jagtap 2007). Researches have shown that Nigeria is already being plagued with diverse ecological problems, which have been directly linked to the on-going climate change (NEST 2003; Ayuba et al. 2007). Odjugo and Ikhuoria (2003) depicted that climate change has started accelerating desertification by simply impacting negatively on plant species composition in North Eastern Nigeria (Ayuba et al., 2007). According to Odjugo (2005) erratic pattern of weather elements are observed in Nigeria and the number of rain days dropped by 53% in the north-eastern Nigeria and 14% in the Niger-Delta Coastal areas. These may not be the only impacts of climate change in Nigeria. This is a clear evidence of climate change because a notable impact of climate change is, increasing rainfall in most coastal areas and decreasing rains in the continental interiors (IPCC 1996). In the recent decades, the temporal events have become more obvious in Nigeria; the annual amount of rainfall has declined drastically, most especially in the ecologically disadvantageous region, i.e. the northern region of the country, a phenomenon attributable to the *climate change* (Idowu, 2011).

According to the United Nations International Panel on Climate Change, climate change is progressing and will have widespread effects on human life and natural systems (IPCC, 2007). Successful climate change adaptation requires appropriate knowledge, skills and behaviour change that education can provide (Kane and Yoga, 2000). By raising awareness and promoting knowledge and skills-development, education is an essential component and a catalyst for responding to global climate change. Its importance has been increasingly highlighted at the international level. In particular, Article 6 of the UN Framework Convention on Climate Change (UNFCCC) encourages Parties to promote, develop and implement educational, training and public awareness programmes on climate change and its effects. In addition, the United Nations General Assembly proclaimed the UN Decade of Education for Sustainable Development (DESD) 2005-2014, emphasizing that climate change is one of the key action themes of the Decade (UNESCO, 2009). In order to tackle further suffering, there is a growing quest for synergy between education and climate change adaptation due to concerns of inefficiency and ineffectiveness of the past approaches to climate change (UNESCO, 2005) and education is rooted in Agenda 21, the outcome document of the 1992 UN Conference on Environment and Development (the "Earth Summit"), which emphasizes its importance in achieving sustainable development (UNESCO, 2012).

Specifically, education can enable individuals and communities to make informed decisions and take action for climate change adaptation. This has been constituted in many world debates and forums about climate change since the popularity of the phenomena a century ago. In two major climate treaties, the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, articles calling on governments to support education for climate change are proposed (UNFCCC). This is complemented by the focus on education and knowledge as a priority for risk reduction within the *Hyogo Framework for Action: Building the Resilience of Communities and Nations to Disasters, 2005-2015*. In the global education community, several stakeholders, such as UNESCO, UNEP and UNICEF, are incorporating components of the climate change agenda in education. Education and research are key to building adaptive capacity, particularly if linked to practice through extension (AMCEN, 2011).

The education sector offers a currently untapped opportunity to combat climate change. To show its commitment to addressing the challenges of climate change, Nigeria was one of the first countries to sign and ratify the United Nations Framework Convention on Climate Change in Rio de Janeiro in June 1992 and yet no significant role is assigned for climate change education at all levels of the country's fight against the phenomenon. This study is aimed at coordinating all climate change related issues in the area that will assist the government with establishing appropriate policies to address climate change. Yet Dobie (2003) concluded that

remote communities are seldom well served basic educational services, and their populations suffer as a result. Medugu (2009) noted that despite this huge implication of climate change response measures for Nigeria's economy, it is appalling that there is no visible demonstration of the preparedness of the government to tackle this issue.

2. Climate Change Adaptation: Why the Drylands

Climate change impact threatened to be a worst disaster of present time because it tends to reverse all mitigation and adaptation efforts especially in the drylands which is ravaged with many constraints. According to the 4th IPCC Assessment Report, there is already evidence that Africa is warming faster than the global average, and this is likely to continue (IPCC, 2007). With the growing consensus among scientists, policy makers and development practitioners that climate change poses complex challenges to world, what more of the drylands that are lost at the policy levels. Recent scientific information since the Inter-governmental Panel on Climate Change (IPCC) 4th Assessment Report confirms the world is on course for levels of warming that will be catastrophic for drylands. Drylands are predicted to be heavily impacted by climate change (United Nations Environment Management Group, 2011) although the drylands of Africa, exclusive of hyper-arid zones, occupy about 43 per cent of the continent, and are home to a rapidly growing population that currently stands at about 325 million people (UNCCD/UNDP/UNEP, 2009).

The UNCCD – the main convention dedicated to drylands and related issues of desertification, land degradation and drought – does not currently have a dedicated observing system or a stable, long-term, scientific advisory body to provide relevant, accurate and timely information to the various decision-makers, managers and stakeholders committed to the sustainable development of drylands (Akhtar-Schuster *et al*. 2011). Coupled with the fact that, over millennia people of the drylands have lived with variable rainfall and frequent droughts using a range of coping strategies, but changing circumstances mean that these traditional methods must be capitalized upon and enhanced, strengthening the adaptive capacity of global drylands to manage environmental change, including climate change is imperative.

Adapting to climate change entails taking the right measures to reduce the negative effects of climate change (or exploit the positive ones) by making the appropriate adjustments and changes" (UNFCCC, 2007). Adaptation therefore aims at reducing vulnerability to climatic change and vulnerability of communities, regions, and nations to climate variability, and in promoting sustainable development (IPCC, 2001). Existing adaptation strategies may not work under future changes and consequently more work on adaptation preparedness would be required. Improving communication between research communities and users is a pre-requisite for an effective adaptation strategy. Moreover, it is important to identify mechanisms for ensuring the adoption and incorporation of climate information including forecasts into the livelihood strategies of different stakeholder groups (Washington et al., 2004). According to Ifejika (2010) increasing efforts are needed if adaptation is to be seen as a dynamic, continuous and non-linear process. Inhabitants of drylands in Africa have learnt, over millennia, to cope with permanent water scarcity, variable inter- and intra-seasonal rainfall and the recurrent risks of weather-related shocks (Campbell, 1977; IAASTD, 2009) thus adaptation requires still more efforts on improving education.

3. Study Area

Kabobi village is located in Kaita local government of Katsina State at approx. 40.22 kilometres North-East of Katsina town. It is located between latitude 12^0 53.6^I N and 12^0 53.7^I N and Longitude 007^0 35.11^I E and 007^0 35.12^I. Kabobi shares a common border with Dan Matyawa a typical dry land village in the Maradi Deppartment of Nigeria Republic.

The climate of the study area is the 'Aw' type as determined by Koppen in which distinctive wet and dry seasons are caused by the fluctuations of the ITCZ (Inter-tropical convergence zone) or the ITD south to north to bring rainy season and north to south to bring dry season. The amount of rainfall and the duration of the rainy season increases southwards from about 250mm/yr or 300mm/yr and 3 – 4 months annually. Temperature in the area varies according to the season of the year. It is generally cool in the morning, hot in the afternoon, and very cool in the evening. Maximum temperature range is between 29^0C and 38^0C but harmattan season (November to February) lowers temperature to about 18^0C and 27^0C in the noon.

Table 1. Facilities in Kabobi Village as at January 2015.

Type of Facilities	Amount	Type	Remarks
No of Schools	1	Primary	Few blocks with few no-resident teachers
No of Clinic	1	Dispensary	Only one CHEW, 2 non-resident voluntary staff
No. of Improved Water Points	2	Boreholes	Built by a politician

Source: Field work (2015)

Kabobi village is so remote and shares common border with

Danmatyawa in Niger Republic. A part from the two water points, people of the area mentioned that they hardly could remember government intervention. Table 1 below further justify these assertions and many more.

With the widespread change in resource sharing patterns in various parts of the Nigeria, for years people of Kabobi village have two blocks of classroom as school. The village is just 42 km away from Katsina City and laudable concern attests not only to the concentration of a vast number of schools and social amenities in the urban areas whilst the village has only one source of healthcare centre which is epileptic as at the time of our survey. This shows that little has been done to explore the necessary enabling impetus which education has to offer. Schools can lead by example by strengthening mitigation programmes (e.g. new techniques of briquetting) or by integrating new programmes (e.g. school gardens) while the clinics can raise awareness on climate change related health problems.

4. Methodology

This section discusses the population frame, techniques of data collection as well as methods of analysis.

Population

Data obtained from National Primary Health Care Unit of Kaita local government showed that the estimated population of Kabobi Village is 2900 as at September 2014. For the purpose of the study, a population frame of 102 respondents of the area who possesses basic education certificate as contained in the National Policy of Education 2004 was drawn. The identification of members of the population frame and compilation of the list was made in January 2015 by a local resident who was employed as field assistant. The respondents were stratified based on their levels of basic education i.e non-formal group, primary and junior secondary levels of education as classified in the National Policy and represented in Table 2.

Table 2. Characteristics of Respondents.

Age Range	No. of Respondents	Gender of Respondents	Levels of Education	Non Formal Primary	Junior Sec.
Less than 20	08	6 males, 2 females	04	04	00
21-30	31	All males	15	11	05
31-40	28	All males	18	08	02
41-50	27	All males	23	04	00
51-60	08	All males	08	-	-
60+	00	-	-	-	-
Total	102	100 Males	68	27	07

Source: Field work (2015)

Ages of the respondents fall between 15 to 60 years in line with the local tradition of the area that only individuals of 15+ years are allowed to speak to outsiders on any issue.

Data Collection

Questionnaires were served to a total of 102 respondents with the help of a local assistant and retrieved a week later. A questionnaire consisting of 15 semi structured questions was used for data collection. Data collected was primarily qualitative thus it is presented in tables, pie chart and bar graphs.

5. Results and Discussion

This section presents the results of the study and discussed it appropriately.

Levels of Education of the Respondents

At present the respondents are undergoing daunting challenges including poor access to Education. This has weakened their level of awareness of major environmental problems affecting the drylands. To most respondents, the village is endowed with huge potential for education which is being threatened by both lack of nearby school and remoteness.

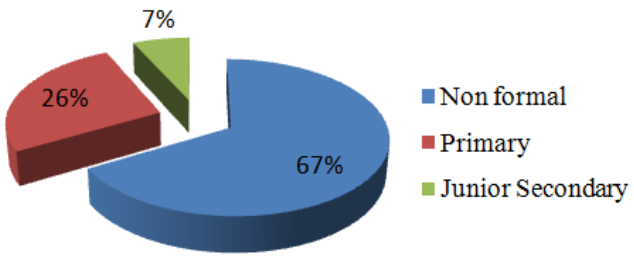

Figure 1. Levels of Education of Respondents in Kabobi Village.

Evidence from the literature indicates that the study is in consistence with result of many studies which demonstrated that the level of education among rural dwellers (especially dryland people) has maintained unprecedented low in Northern Nigeria. Result in table 2 has evidently justified that despite growing number of initiatives by governments at all levels and the international commitments (MDGs), overwhelming majority of the respondents possess non formal education in the area. It is not surprising to have a level of climate change awareness so low in the village; less than 40% of the respondents who cannot describe the climate

change very well are aware of its impact in the area. With this low level of education in the area, one would imagine how people will create new ways of adapting to climate change. However, because there is a clear education lapse in climate change adaptation and mitigation strategies, vulnerabilities and risks of climate change are very high in the area.

Studies have also shown that gender and education tend to predict perceived climate risks (Agho et al. 2010; Wolf and Moser 2011). In relation to climate change specifically, recent research suggests that general empowerment of populations through universal primary and secondary education is not only essential to poverty alleviation and economic growth but also to reducing vulnerability to natural disasters (Lutz, Muttarak, and Striessnig, 2014). O' Connor et al. (1999) found that higher education was associated with less perceived risk as a result of climate change, while Agho et al. (2010) find that those with a university degree were more likely to think that global warming would increase.

Awareness of Climate Change among Respondents

Climate change has been claimed to have low salience as a risk issue because it cannot be directly experienced by many. Climate change is an area that is in dire need of publicity to help the public make informed decisions in its adaptation and mitigation. Figure 2 shows how level of awareness of climate change vary according to years of respondents. It proved to us that basic education has strong correlation with public awareness of climate change.

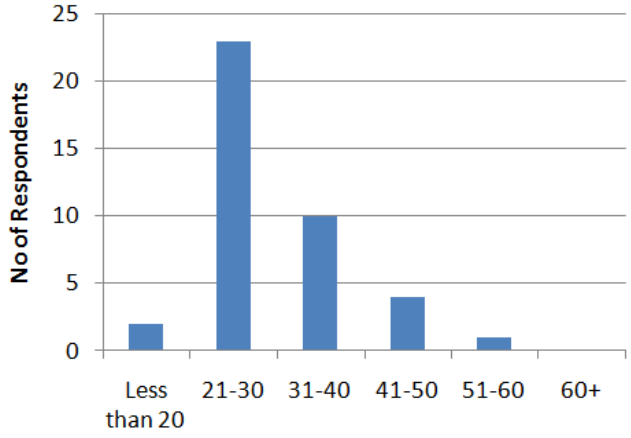

Figure 2. Level of awareness according to Respondents n= 40 (only those aware of climate change).

Result in figure 3 showed that largest fraction of respondents aged 21-40 are aware of climate change in the area while no respondent above 60 years as well as fewer below 20 years claimed knowledge of the phenomena. The general result is not new because the majority of respondents who stated they have knowledge of climate change were found to be young people who have less economic and intuitive muscle to adapt to harsh times in the area. These are set of people (21-40 years) that mostly migrate to the cities in search of better life; but recently failure to remit to families has become widespread in the area.

Doss and Morris (2001) opine that the perspectives of the indigenous people, the way they think and behave in relation to climate change, as well as their values and aspirations have a significant role to play in addressing climate change. Despite their awareness of changing weather patterns, people in Africa, are particularly misinformed about global climate change (Taderera, 2010). The low level of awareness on climate change across sub-Saharan African countries is attributed to limited awareness campaigns on one hand and the fact that African countries have got too many problems ranging from poverty to political conflicts on the other hand (UNFCCC, 2007) hence climate change is never a priority issue.

Sources of Information of Climate Change

Sources of information regarding climate change determine how well people accept most decisions affecting the phenomena. It is clear that climate change awareness requires prerequisite; first good communication channels as well as educated people who will eventually want to know about the phenomena.

Table 3. Sources of Climate Change Information of Respondents of Kabobi.

Sources	No. of Respondents	Percentage (%)
Radio	27	68
Television	02	05
School	00	00
Contact with Persons	06	15
Via mobile phone	05	12
Total	40	100

Source: Field work (2015)

n= 40 (only those aware of climate change)

Overwhelming majority of respondents (68%) mentioned that they source information of climate change from the radio. This shows strong attachment to radio device as only way of accessing information. No respondents mentioned school as source of information of climate change. It is not surprising to find out that the information on the phenomena has not been sourced from the school because no part of the National Policy on Education or any component on Nigeria's curriculum contain climate change. With the current low levels of literacy and gaps in reconciling policies of education with current events, it's not surprising to note that the general public are still ignorant about climate change. This may be in consistence with many findings that climate change is still not known by most Africans (e.g Idowu et al., 2015). This result show that other means such as personal contact and use of mobile phone may be good sources of

information on climate change if well utilised.

Climate change has been claimed to have low salience as a risk issue because it cannot be directly experienced. Being a statistical phenomenon (as climate is defined in terms of average weather), climate is not straightforwardly observable as indicated in studies for example (Moser and Ekstrom, 2010). Leiserowitz et al. (2014) contended that a large majority of the general public wants to know more about the topic of climate but do not know where to turn for credible information. Unfortunately, the public discourse on climate science, climate change, and society's possible responses has become polluted (Rapley et al., 2014), greatly complicating attempts at communication. The study above indicated the need to have a reliable source of climate change information which could be school in this context.

Impact of Climate Change in the Area

IPCC (2007) holds that climate change will have a strong impact on Nigeria; particularly in the areas of agriculture, land use, energy, biodiversity and health as well as water resources. Below are key areas which climate change has affected in the area.

Table 4. Effects of Climate Change on People of Kabobi Village.

Impacts	No. of Respondents	Percentage (%)
Crop Failure	18	17.64
Food Insecurity	20	19.60
Genetic Erosion	07	6.86
Increase in Migration	30	29.42
Loss of Vegetation	15	14.70
Low Productivity of Animal	12	11.78
Total	102	100

Source: Field work (2015).

Result in table 4 show those socio-economic variables such as migration of the youth (productive age group); crop failure and shortage of food are the most devastating effects of climate change in the area. Other effects are on vegetation loss and genetic erosion which are not so evident but still strongly impacting as observed by the respondents. Migration as climate adaptation will increase population pressure and the balance of poor/ non-poor, and will destabilize property rights systems.

The most devastating adverse impacts of climate change in Nigeria and other subtropical countries includes frequent drought, increased environmental damage, increased infestation of crop by pests and diseases, depletion of household assets, increased rural urban migration, increased biodiversity loss, depletion of wildlife and other natural resource base, changes in the vegetation type, decline in forest resources, decline in soil conditions (soil moisture and nutrients), increased health risks and the spread of infectious diseases, changing livelihood systems, etc (Reilly, 1999).

Nigeria is one of the countries expected to be most affected by the impacts of climate change through sea level rise along her coast line, intensified desertification, erosion and flooding disasters and general land degradation (Medugu, 2009). Consequently food products in many part of the country are becoming more expensive, in some cases scarce, severely compromised, exacerbating food security problems and malnutrition; poverty, hunger, diseases; and communal conflicts resulting from the lost of 92, 000 hectares of land to drought and desertification (Commission for Sustainable Development, 2008).

Climate Change Adaptation Strategies of the Area

It is important to note that the adaptation options outlined in this paper are not an exhaustive list, but are indicative of a range of wide measures at the disposal of the respondents. Thus, while these options are presented, they may be different among respondents; though many are applicable across two or more people. Despite increasing adaptation challenges, international attention continues to focus on policy issues while adaptation is a key priority for more vulnerable developing countries.

Table 5. Local Strategies of Climate Change Adaptation in Kabobi Village.

Strategies	No. of Respondents	Remarks
Old		
Mixed Cropping	40	Simple, rewarding
Early Planting	30	Simple but demanding
Seed Banking	14	Simple, not effective
Keeping Small Ruminants	18	Difficult, rewarding
Total	102	
New		
Agroforestry	30	Profitable, crucial
Local Savings Scheme	28	Requires extra care,
Poultry Keeping	19	rewarding
NTFPs Entrepreneurship	12	Too demanding,
Seed Diversification	13	rewarding
		Less effort, eke
Total	102	livelihood
		Difficult, few benefits

Source: Field work (2015).

Several old and emerging local strategies of climate change adaptation are reported in the area. These range from intuitive generational techniques to innovative methods brought to the area via contacts and diffusions over long time. Mixed cropping and early planting are mostly patronised techniques of the area. These techniques are intuitive strategies that do not require much cost of operation and may not suffice in the future.

In many cases, adaptation activities are more local (that is district, regional or national) issues rather than international (Parry et al., 2005). This is because different communities in different geographical locations and scales are exposed to different levels of vulnerability and possess varying adaptive

capacities, thus they tend to be impacted differently, and thereby exhibiting different adaptation needs (Ndesanjo, 2009). In line with Boko et al., (2007) that as a result of high poverty rates, changing socio-economic and political circumstances and demographic growth, traditional coping strategies are increasingly becoming insufficient. Consequent to lack of proper knowledge of the phenomena, many traditional adaptive knowledge and livelihood strategies practised in drylands for centuries no longer suffice or are inefficient (Boko et al., 2007). Majule et al. (2008) noted that adaptive capacity to climate change varies within communities due to various factors including variation on wealth among social groups, age, gender and sex.

Contemporary techniques such as agroforestry and local schemes are practised as promising strategies in the area. Informed people of the area believed that adaptation to climate change requires individuals to understand the implications of climate change on their lives. Already climate change rate is gradually exceeding the adaptive capacity of a broad range of crop and forage varieties, animal breeds, and tree populations used Nigeria, ten years earlier than the prediction of IPCC, climate model prediction of 2020 (IPCC, 2007). This makes international researches and reports such as UNCCD/UNDP/UNEP (2009) to conclude that it requires individuals to assess the risks such changes hold for their identity and future, and to make informed decisions on how to adapt their livelihoods, homes and communities.

Local Perceptions on the Role of Education on Climate Change Adaptation

Understanding public perceptions of climate change is fundamental to both climate science and policy. To date, most studies addressing climate change education have been based on higher levels of education. Over the last two decades, however, a growing body of scholarship has focused on understanding public perceptions of global warming and climate change, including how people recognize, understand, and respond to risk (O'Connor et al. 1999; Agho et al. 2010).

Table 6. Role of Education on Climate Change Adaptation.

Roles	No. of Respondents	Percentage (%)
Positive	05	04
Non	57	56
Don't Know	40	40
Total	102	100

Source: Field work (2015)

Most of the respondents supported the idea that Climate Change Education should be included in basic education because it's inclusion is fundamental to local and global adaptation initiatives. The 40% that are undecided on the role of education on adaptation are mostly the elderly respondents who still see no reality of climate change from local stance. Hence they could never support any argument surrounding such discuss not even to recommend appropriately. This is not far from the results of many studies conducted in Africa on perceptions of Climate Change among local respondents that it's still not real.

Constraints to Adaptation in the Area

- Lack of recognition of indigenous technologies that have adaptation potentials,
- Marginalization of drylands dwellers at policy levels,
- Inadequate institutional support to diversify rural income,
- Limited subsidies, credit and technical support to local actors,

6. Conclusion

People of Kabobi Village commonly express climate change inform of decrease in annual rainfall, erratic distribution of rainfall and decrease in number of rainy days, delayed arrival of monsoon and an increase in temperature. Peoples' perceptions of climate change and experience of extreme events matches closely with the inferences drawn from scientific data analysis in various studies (e.g Odjugo, 2010).

Of course climate change has become global phenomena of our time that is the good reason which compels Ban Ki-moon to assert that "climate change is the defining challenge of our age", at CMP 3, Bali, Indonesia. Climate change adaptation needs proper blend of various geographic, climatic, human, social, traditional, historic factors and perspectives. Education can play an important role in facilitating adaptation to the challenges posed by climate change. It can help reduce the vulnerability of communities and improve their capacity to adapt to changes in their social, economic and ecological environment, and an uncertain future.

This work has established the fact that climate change adaptation needs a requisite knowledge of contemporary ideas and practices brought by the 21st century. Most importantly, it requires individuals to make informed decisions on how to adapt their lives and livelihoods to the effects of climate change and reduce risk and vulnerability. Education for adaptation plays a key role in enhancing the resilience of communities, in particular, in rural areas where livelihoods are dependent on the weather. Education programmes can help to raise awareness of changing farming requirements and incorporate climate information into the decision making of rural communities.

Though extended parts of Nigeria are flooded with schools, her literacy levels continue to show gloomy trend since last decades. In their various efforts, facets of the Nigerian government tend to combat climate change through

establishment of policy mechanisms at technical, financial and institutional levels and several projects and programmes while forgetting to target educators and students. One important mechanism through which education influences human well-being is neurocognitive development. Learning basic literacy, numeracy, and abstraction skills enhances cognitive capacities through raising the efficiency of individuals' cognitive processes and logical reasoning (Baker et al., 2012). Accordingly, because preventive action is initiated by stressors, such as perception of risk, followed by assessments of one's ability to respond to the threat, the more educated tend to have greater risk awareness because of better understanding of the consequences of their actions, e.g., as found in several case studies.

Recommendations

Based on the findings of the study, it was recommended that;

1. Basic education curriculum should be revised to include climate change syllables in indigenous language. This can be achieved through the integration of local stake holders in policy formulation and implementation.
2. Better early warning systems and better communication gadgets should be mounted and/or made available to local managers for easy dissemination of ideas.
3. More attention for entitlement changes (e.g. land, water and forest rights) and for conflict prevention between groups with different identities (e.g. farmers/herders) should be given. This can be achieved through better governance of rural resources and change of policy approach.
4. Dryland landscapes should be integrated more effectively into global adaptation strategies through adequate development assistance and carbon-financing, livelihoods improvement as well as knowledge sharing.

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