Climate Change Adaptation Practices of Rural Farmers in Benue and Kano States of Nigeria

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ABSTRACT

Global climate change impacts have recently become the most devastating human problem become climate change causes remain substantially unabated. Rural farming communities in Nigeria have suffered varying degrees of climate vulnerabilities resulting in wanton destruction of live and property. To offset ravaging impacts of climate change, rural communities in Benue and Kano State developed coping strategies in the form of deforestation for arable agriculture, firewood marking, logging, charcoal production, furniture/wood working and wanton exploitation of non- forest resources. These coping strategies rather destroyed the landscapes and increased vulnerabilities in the communities. Climate change adaptation pilot project component of the "Building Nigeria's Response to climate change" (BNRCC) Project was experiment in Daudu and Falgore communities of Benue and Kano State respectively to alleviate the increasing vulnerabilities of the rural communities. The locals adopted various sustainable climate change adaptation initiatives to build resilience. Reduce poverty and improve living conditions of the vulnerable population especially women, youths and children. The success of these adaptation activities has generated wide scale replication among several farming communities around primary beneficiary sites in Benue and Kano States of Nigeria. This paper examined the successful climate change adaptation initiatives of the BNRCC pilot project being replicated in other farming communities in Benue and Kano States and the challenges faced by the farmers in implementing those adaptation initiatives.

INTRODUCTION

Daudu and Falgore communities in Benue and Kano State respectively were selected as sites for implementing "Building Nigeria's Response to climate change (BNRCC)" pilot project in 2009. The BNRCC pilot project was attracted to the communities by a non-government organization known as Green watch Initiative. The organization had previous knowledge of the adaptation needs of these mainly agrarian communities. Vulnerability assessment was done to identify most affected and less influential stakeholder, climate change event, impact and community responses, vulnerable group/features, community structure, resources and most vulnerable area in the community (BNRCC,2010). Community- driven and gender sensitive approaches were used to facilitate the adoption of sustainable climate friendly adaptation practices which were established in Daudu and Falgore communities in Benue and Kano State respectively. The BNRCC pilot project beneficiaries experienced high crop yield, reduced poverty and increased living condition the success stories motivated neighboring communities to replicate the successful climate change adaptation practices to build resilience and reduce vulnerability.

Prior to the introduction of the adaption project, rural communities in Benue and Kano State were experiencing severe impacts of climate change culminating in declining agricultural productivity, increasing morbidity and mortality, drought, flooding and increasing energy demand. These and the chain of causal reactions were known to have aggravated poverty and negatively affected livelihood of the people especially woman, youth and children (BNRCC, 2010). Coping strategies used by the locals included wanton deforestation for charcoal production and fuel wood, tradition arable farming, logging and exploitation for non-timber forest products (FAO,2007;NEST, 2004). These coping strategies provided short term relief to the farmer but ended up devastating more of the environment and inflicting severe damage on the people (IUCN,2006). Climate change impact had substantially destroyed lives and properties due to extreme famine, flooding, drought, erosion, biodiversity loss and conflict arising from competition for scarce

resource (UNEP,2005) word Development Repost (2010) had repost that in the absence of clear near term climate change mitigation programmers, climate change events would continue to deepen vulnerabilities, erode hard-won gains and seriously undermine prospects for development. The repost of inter-government panel on climate change (IPCC,2007) established that ever if all climate change causes were halted immediately, the carbon footprints in circulation would inflict climate change calamities on humanity for the next 50 years, hence for enhanced resilience's building and climate change adaptation practices in the communities.

Climate change adaptation initative being implemented in Daudu and Falgore communities

According to BNRCC (2010) the successful climate change adaptation practices being replicated by rural farmers in Benue and Kano state includes the following:

i. Climate change sensitization: Rural farmers in Benue and Kano state are highly sensitive to climate change events and they reacted positively to climate predictions/daily weather forecast by organizing their tasks to fall within favourable periods. Annual rainfall/climate predictions by Nigerian meteorological agency (NIMET) assist farmers in planning the time of cultivation, planting, fertilizers applications, harvest, etc.

ii. Use of improved crop varies: farmers have substituted low-yield traditional crops with early maturing, drought/pest resistant and high yielding crop varieties, in Benue state, crop mostly produced include yam, rice, groundnut, maize, soybean, cassava, potato, guinea corn, beniseed, pepper, tomato, and vegetable. In Kano state maize, rice, groundnut, sugar, onions, vegetable and pepper are produced in large quantities using improved varieties.

iii. Cash crop production: orchard of improved varieties of cash crop like orange mango, oil palm an guava are established by farmers to in Benue state as a means of accruing perennial income with less effort. In Kano state orchards of *Acacia spp* and orange are being developed by some farmers to augment family income.

iv. Dry season farming: farmers along perennial streams and rivers in Benue and Kano state practice dry season farming using engine water pumps to irrigate their farms. Crops mostly grown include early maturing rice, onions and pepper. In some communities of Kano state, dry season irrigation is achieved through the use of irrigation canals and engine powered wash wells.

v. Low cost wood efficient stoves: various kind of low cost wood-efficient stoves are used by households for domestic cooking in Benue and Kano state. The stoves use less wood/charcoal and cook faster than conventional wood-burning stove that use more wood. The use of these stoves has reduced wood exploitations and consequently lowered the rate of deforestation in the communities.

vi. Livelihood diversification: falling fish catches and crop failure had led to an upsurge of various livelihood activities such as fish and poultry farming, animal husbandry and bee-keeping in order to diversify family income.

Challenges to effective practice of climate adaptation initiatives by farmers in Benue and Kano states

Despite widespread replication of climate change adaption initiatives by rural farmers in Benue and Kano states, there were still challenges to the effective practice of these adaptation initiatives, and these includes the following:

i. Conflict due to competition for resources: there are increasing cases of conflict among farmers themselves and between farmers and pastoralists over land and water resources, conflicts arising from competitions for arable land and scares water points have led to the wanton loss of lives ad properties with several internally displaced people talking refuge in camps especially in Benue state. Farmers in those communities are unable to farm and therefore face severe food shortage and malnutrition.

ii. Post-harvest losses: farmers experience high yield from cultivation of improved crop varies, but loss over 40% of the produce due to spoilage as a result of lack of processing and storage facilities, hence, gain accruable from climate change adaptation practice are lost to post harvest spoilage, farmers of perishable crops are most times unable reap the fruits of their labor.

iii. Use of pesticides and herbicides: there is widespread application of pesticides and herbicides to control pest and weed on the farmlands in Benue and Kano state. The chemicals with their high level of toxicity are absorbed by crops and finally transferred to man through food chain. Parts of the chemicals settle in the soil and also in the ground water which have concomitant effect on soil micro fauna. Increase cases of renal failures and liver disease are attributed to excessive exposure to bio-degradable chemicals.

iv. Prevalence of coping strategies: illegal logging, commercial fuelwood exploitation and charcoal productions were still on the rise in Benue and Kano state. These have resulted in massive deforestation and gradual incursion of aridity. Some farming families still indulge in these activities despite early warning measures.

v. Frequency if climate change impacts: farmers' resilience is often overwhelmed by frequent incidence of climate events like flooding, heat waves. Prolonged drought and epidemics which destroys crops, livestock, lives and property, as well as the environment.

vi. Financial barriers are one of the key barriers that restrict farmers in Benue State to climate change adaptation strategies (Peterson, 2013). Financial barriers are largely related to budget deficits experienced in many States across nation (Adejuwon 2004). Every form of adaptation entails some direct or indirect financial costs. For instance, the uses of improved varieties of crops has been reported as one of the key adaptation strategies for farmers in Benue State (BNRCC, 2010).

vii. Adequate information on climate change characteristics is a very powerful tool that can be used to enhance the adaptation strategies by farmers in Benue State this is particularly important for Nigeria (IPCC,2007) and Benue State, where there are few considering that most farmers in Benue State depend on rain-fed agricultural systems. Hence, lack of appropriate climate information could be critical for food security in the area Evan though NIMET has been providing the state with climate information, it usually come in the form of seasonal forecasts that may not be useful in long-term planning of agricultural activities (Ziervogel *et al*., 2010). This has often lead to food insecurity in the state. The information barriers to climate change adaptation action by the farmers in the state, may be similar to finding by Adger *et al* (2009), who suggested that information and awareness on climate change adaptation strategies could potentially serve as barrier to successful implementation of adaptation practices. Flood. preparedness involves the development of emergency plan and early warning systems that have the capacity to provide real-time climate information to aid decision making on flood. Providing early warning system and climate risk information for flood. Mitigation has been acknowledged by major international conferences. One of the key policy priorities at the world summit on Sustainable Development was the provision of early warning system that are affordable and locally available to the people so as to enhance timely responses to incidences of flood. Successful implementation of climate adaptation strategies requires that farmers do not only have sufficient knowledge about the available options, but have adequate capability to assess the available option so as to make informed decision on the best adaptation strategies (Lee, 2007).

viii. The lack of appropriate information on climate change characteristics could be related to the lack of adequate and state-of – the art equipment at meteorological department across the state. Many of the weather stations are ill-equipped to produce real-time scale climate information for adaptation .this prevents the time predication and forecast of the rainfall pattern to enable farmers to make informed decision farmers in Benue State use their indigenous and agro-ecological knowledge, based on the past experience, to form complex mental models of the climate with which they forecast the weather.

The Way Forward

Provision of credit facilities for climate adaptation strategies in the state. Government should liaise with bank to extend credit facilities to farmers. Because most farmers in the state cannot provide the necessary collateral that bank demand for the provision of credit. It is significant to stress that it is most desirable to give financial assistance to farmers at the beginning of the farming season e.g. provision of flood resistance crops, provision of fertilizers, hire tractors to prepare their farm land and purchase involved in granting credit facilities and loan to farmers should be initiated well in advance of the farming season.

Development of early warning system and effective communication channels for climate adaptation: Nigerian government should invest heavily in early warning systems on drought and floods to aid farmers in planning their farming operations. Effective communication of information on climate change strategies adaptation is essential for adaptation by farmers as communication increases understanding and awareness (Moser, 2011). In this regard appropriate communication mechanisms including the use of local radio stations broadcasting in local dialect could be used to ensure that such climate information and warnings reach the intended farmers.

Improving human capital development to facilitate climate adaptation: Nigeria has low expertise in climate research (NEST,2004). Hence, there should be concerted efforts to improve the overall human capital development in order to improve quality research into climate-related hazards. The role of extension services in agricultural adaptation to climate change has been documented in Nigeria (Mustapha *et al*., 2012). Efforts should be made by policy markers both at national, satate and local government levels to improve farming practices by strengthening the capacity of extension officers through increased staff number and training of staff with different specialists linked to different crops, especially staple crops such as maize, rice vegetables and cassava that hold great prospect for food security in the state in particular and to the country as a whole.

Appropriate institutional and Policy Environments: Appropriate institutional and Policy environments should be created for climate adaptations. Supportive institutional framework at the local, state, national and international levels is critical in enabling successful climate change adaptation strategies to the farmers in the rural communities of Benue State. In addition, there is a need for proper coordination amongst the various institutions involved in climate adaptation programmes. There should be close collaboration between the meteorological services and extension services for forecasts to be made available to farmers for climate change adaptation actions in the state.

CONCLUSION AND RECOMMENDATION

Climate change adaptation initiatives adopted by farmers in Benue and Kano States have assisted in building resilience to climate change impact and development alternative income source for the families. However, the quantum of challenges faced by farmers while implementing these adaption approaches has the capacity to undermine all the gains recorded in the process if not immediately addressed. It is therefore recommended that concerted efforts should be made by relevant governmental and non-governmental agencies in addressing these observed challenges and mitigating climate change causes. Halting climate change causes will substantially reduce poverty and improved quantity of life of the people.

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