

## Extension's role and stakeholders' intervention in climate change advocacy

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### Abstract

The world's agricultural system has been terribly affected by climate change and consequently the future of agriculture, its practices and productivity is hampered. Hence, this paper presents the agricultural and environmental problems associated with climate change and seeks to proffer possible solutions through the intervention of extension services and stakeholders. It focuses on the role of agricultural extension and its immense import in influencing crop production practices that will ensure sustainability and improve soil management. To effect a change in a diverging economy with critical climatic conditions, it becomes imperative that scientific, technological and conceptual policy practices that will reduce negative environmental impacts must be integrated and implemented.

**Keywords:** Agricultural advisory services, Agricultural production practices, Climate change, Mitigating factors

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### Introduction

Recent empirical evidences have shown significant changes in agricultural systems. These changes invariably are as a result of climate change and other environmental factors. Although several research studies have been carried out, for example by (Agwu (2009), Ajetomobi (2010), Apata (2010) and others but most of their work centered on actual and projected impact of climate change, not so much work have been done on coping mechanism, adaptation and mitigations strategies. Beyond broad generalizations, the impact of climate change is more widely felt in the developing countries due to their greater vulnerabilities and lesser ability to mitigate effects on climate change (Sajjad, Yung, Ishaq, et al., 2017). Corroborating this, IPCC (2015) remarked that climate change in Africa is exacerbated by low levels of adaptation and mitigations.

Climate change often result into high frequency and intensity of extreme weather events such as high temperatures, frost, droughts, flood and storms, declining water resources and loss of biodiversity. As global temperature rises, there are changes in areas suitable for agriculture and how much of the world's land that can be used. For example, a rise in temperature in the range of 5-7°C in the last 100 years has drastically altered the natural vegetation of the environment (IPCC, 2007). Other indicators of climate change are rainfall, evaporation, drought and wind. More than 95 percent of the agricultural production in sub-Saharan Africa is rain-fed (Simelton et al 2013). Yet, according to IPCC (2013) and IPCC (2014) there are uncertainty about future rainfall patterns in southern Sahara, Guinea coast and Sahel. Saul (2015) also noted that climate change is already having impact in Nigeria.

### Extension Role and Its Intervention in Climate Change Advocacy

In Africa, increased demographic pressure is creating

scarcity of land and reduced periods of fallow. According to Narain (1985), it was believed that there is no available technology by which the traditional farmer can adjust to the reduced fallow periods and experienced a more intensified agriculture. Up till now, the erratic nature of the weather makes cultivation and management of crops on the field difficult. In their study, Enete and Amusa (2010) highlighted the critical challenges faced by the Nigerian agriculture as it tries to adapt to climate change. The challenges are lack of requisite education, information and training necessary to adapt to climate change. A report from UNDP confirms that the level of awareness about climate change is low in Nigeria, and it was noted that if care is not taken, it will wreak havoc on the daily lives of its citizen.

Prokopy, Bartsels, Burniske and Power (2017) however found that farmers are beginning to understand that practices that worked in the past are no longer viable in the light of changing weather patterns. Therefore, attaining self-sufficiency in food production is a major problem with the present climatic and environmental condition. They also found that farmers acknowledged the impact of local climate (increasing frequency weather events driven from outside their region) on agricultural practices. This recognition they believe will provide fertile ground for agricultural extension to assist with climate change adaptation now and in the future. Hence, extension workers have an increasingly important role to play if farmers are to learn to adapt and build resilience.

Therefore, extension service providers have an enormous, significant and urgent role to play especially as the unpredictability of climate change has brought new dimension to agricultural research and development (AGRA, 2017). Extension advisory service is vested with the task of promoting the use of best practices that will assist

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smallholder farmers and communities in developing countries to be resilient and cope with the risk of weather extremities caused by climate change. Extension has as one of its major mandate to educate and disseminate information on land use systems like terracing, contouring, crop rotation, soil compacting, building soil organic matter, and conservation tillage. Extension role also include teaching on avoidance of practices that may result into flooding of farmlands, discouraging mono cropping which aggravates pests and diseases that thrive on the new intensive crops. But all these will have their roots in participatory extension approaches.

Hence, there is an extremely important role for extension service providers to play now and in the future of climate change communication. The approach to be employed must put farmers at the centre, though it requires facilitating skills, listening and teaching skills, and ability to be flexible and responsive. Unfortunately, AGRA (2017) discovered that government has tended to ignore extension's work and this is a big problem that will deter its prompt intervention in climate change related information transfer. The funding of agricultural research from federal government budget, which is always the main and now virtually the sole source of funds has also been in regression since the collapse of oil prices in the early 1980s (Enete and Amusa, 2010).

#### **Stakeholders'role in Global Environmentally Sustainable Agriculture**

The response to climate change is about more than what government can do. Industries, research institutions, universities, non-governmental organization (NGOS), private sectors, government organizations, media, communities and individuals all have a role to play. Synergy of these groups is needed to provide support for adaptation and mitigation innovation. Stakeholders' participation involves process whereby all those with a stake in the outcome of a project can actively participate in decision on planning and management. Crispino (2011) advanced that an active participation of enlightened and empowered citizen, communities and other stakeholders would be required for successful implementation of the plans. Similarly, Aloni, Daminabo, Alexander, and Bakpo (2015) affirmed a growing consensus that timely and broad based stakeholder involvement is a vital ingredient for effective environmental assessment, project planning, appraisal and development.

However, IFAD (2013) suggested an institutional policy reforms that needs to articulate a framework for private sector engagement and market access development and incorporate sustainable extension service delivery. In addition, there is need for policy frame work that will provide a suitable environment for continuity and effectiveness in agricultural programmes on climate change. More importantly, policies in the spheres of agricultural risk management, adaptation and mitigation must be adopted and implemented. Research should be based on actual farmers' activities so that its findings can be relevant and easily adoptable. It will also be expected that there is a focus on development of technologies appropriate for farmers. IFAD (2013) had recommended the need for core strategy choices that would ensure that the poor and marginalized are drawn into the policies.

And to effectively manage the impact of climate change, it may require researchers to work with other stakeholders to create a shared understanding of the issues, and develop a range of potential options. Researchers may also aim to be

stakeholders in on-going and long-standing processes. Corroborating this, Prokopy, Barttels, Burniske and Power (2017) reveals a new research approach in which agricultural stakeholders become active participants in the generation of scientific knowledge. Besides, the national government should provide an enabling environment by integrating climate change in sectoral policies to facilitate access to climate change information for decision making. In essence, for effectiveness, climate change adaptation in particular will need to take place at the local and regional level. For example, BNRCC (2017) reveals its aims to help build informed responses to climate change in Nigeria by enhancing capacity at the community, state and national level.

#### **Towards Resilience in Production Systems and Livelihood**

Of recent, there is a growing emphasis on the constraints climate change imposed on agricultural production. FAO (2016) found evidences that climate change has already negatively affected wheat, rice, soy beans and maize yields. Climate-related crop failure is already causing economic losses and undermining food security and these are likely to become more severe as global warming continues. More food is needed in the future but climate change may mean less food production potential and the poor people will be hit the hardest. There have been predicted future economic losses and increase in risk of hunger due to climate change. Enete and Amusa (2010) asserted that the developing world already contends with chronic poverty and food crisis. CBN (2012) reported a decline in agricultural production in Nigeria from 7.2% in 2007 to 5-7 % in 2011. Amanchukwu (2015) maintained that many Nigerians even farmers are aware that climate change is severely affecting livelihood due to changes in rainfall patterns. And since climate change affects crops and regions differently, it is expected that agricultural productivity will decline because of the fluctuating weather patterns. Similarly, Akinbobola, Adedokun and Nwosa (2015) revealed the impairing effect of climate change on agricultural production. Apart from reduction in production, Apata (2016) noted that migration and relocation of some arable crop farmer is another negative effect of climate change. Hence, achieving sustainable food security in a world with a growing population, changing diets and continuously changing climate becomes a major challenge (CGIAR, 2011).

Coupled with this is another notable problem of mismanagement of the environment which invariably leads to fall in production and productivity. Decreased productivity is also as a result of the rapid population growth and decreased per capita food production.

Tackling agricultural production problems, including climate and environment induced problems, is therefore a necessary prerequisite for increasing per capita food production. However, Simmons (2004) had succinctly stated that it is not possible to deal with food insecurity unless investment in agriculture and productivity increase drastically. Hence, more attention should be paid to the climate-related production problems of farmers and efforts must be made to alleviate them.

To promote productive agriculture that conserves and enhances natural resources, partnership that links research and action for low-income agricultural producers and consumers must be practiced.

For example, rural women represent one-quarter of the world's population and they make up around 43 percent of agricultural labour force in developing countries. These women are mostly smallholder farmers who are more exposed to climate change risk than men. The nature and intensity of poverty and vulnerability to risk is also gender-specific. Hence, creating an enabling environment for agricultural production is now necessary and mandatory. There is a dire need also to mitigate the potential negative effects of environment on agricultural production. Emphasis should be laid on why we need to sustain the environment, improve and integrate management of land, water and related biological resources.

Mitigating the impacts of climate change for increased rural and agricultural production requires concerted and coordinated efforts of the extension agents, stakeholders, government and the farmers. The mitigation measures have to do with limiting and controlling climate change (Saul, 2015). Drastic changes in farming practices will remarkably reduce the negative effects of climate change on agricultural system. Therefore, the urgency of dealing with climate change induced problems provides a new impetus for paradigms of integrated research, policy and action. There is need for both local and global policy-linked research to accelerate sharing of information on agricultural practices and technologies for adaptation and mitigation. In addition, government must take necessary measures through extensive methods that will ensure safe environment and increased agricultural productivity.

### Conclusions

Therefore in order to increase rural agricultural production, it is important to consider challenges such as lack of information to small-scale farmers on mitigating measures to limit and control climate change. Therefore, it was suggested that governments should give agricultural and rural development practical and idealistic goals with formulation and implementation of consistent policies on food system that will reduce the negative environmental impact on agricultural production. However, the choice of these policies will still depend on social and political realities for rural development.

Also, there is the need for identification of well targeted community based interventions necessary to meet the emerging challenges, mitigate the effects of climate change and increase crop productivity in order to meet the food and fibre need of the growing population. Lastly, strengthening national and local institutions that provides information and support should be an integral component of development strategies for climate change.

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