Policy Axes that can uphold Agricultural Innovations for Climate Change Adaptation & Food Security in Central Africa: Case of Cameroon, Equatorial Guinea and Central African Republic

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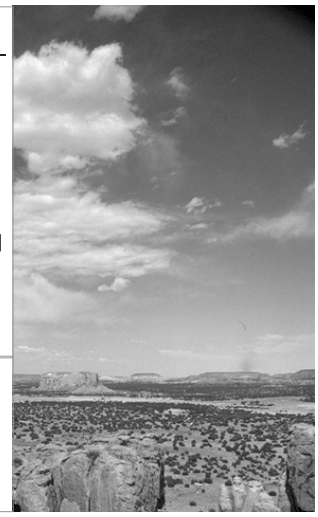

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1. Introduction

For a long time climate change debate revolved around whether climate change exists. However, it has been incontestably proven that the climate is changing and this change is accompanied by both desirable and undesirable effects. The undesirable effects of climate change far outweigh the desirable effects; and any discussion on climate change tends towards the negative impacts. In most cases, discussions are streamlined towards mechanisms to pre-empt or cope with the negative effects of climate change and mitigate their impact. This is more visible in agriculture in Central Africa, where agricultural system is dependent on climatic conditions. Plant diseases and pest infestations, as well as the supply of and demand for irrigation water, are also influenced by climate. The key uncertainty is how agricultural outlook would be in Central Africa in the midst of future climatic change and how it will impinge on food security.

This write up accordingly focuses on policies that can promote agricultural innovations adapted to climate change and food security in Central Africa with particular emphasis on Cameroon, Central African Republic and Equatorial Guinea. It underscores the peculiar characteristics of climate change, highlights the policy gaps and ends with proposals to bridge the policy gaps.

2. Characteristics of Climate Change

To understand the policy gaps and adequately propose policy improvements, it is necessary to contextualize these policy responses within the framework of climate change characteristics. This is important because climate change has distinctive characteristics that influence the benefits and costs of policy responses. Panell, D.J (2010) has substantially expounded on the characteristics of climate change that need to be considered when formulating policy geared towards adaptation. We review four of these policies that are relevant to the Central African context.

2.1. Climate change is slow

According to the Intergovernmental Panel on Climate Change (IPCC), climate change will occur slowly over the coming century and beyond (IPCC 2007); and farmers will have time to adapt to the change as required. This slow change implies that there is time to develop new farming technologies, plants and systems that are better adapted to the new climate.

2.2. Climate change is highly uncertain

Uncertainty is the single most important attribute of climate change as a policy problem (Panell, 2010). For example, there is uncertainty about the relationship between greenhouse gas emissions and global climate because factors other than greenhouse gases (e.g. volcanic activity) also affect climate. This has been historically corroborated by the fact that, climate has changed without changes in atmospheric carbon dioxide concentration, or prior to changes in carbon dioxide (Monnin et al. 2001). Uncertainties related to climate change are invariably pervasive, large and difficult to resolve. This makes it difficult for farmers

to confidently predict climate change and the expected benefits and costs of pre-emptive adaptations

2.3. Climate change is small relative to climate variability
In the short term, the predicted degree of climate change is small relative to year-to-year weather variations or medium-term cycles. Even in the long term, the predicted degree of climate change would not stand out from historical weather patterns when viewed at time frames of, say, a decade or less. This adds to the difficulty of interpreting information from observations of climate and weather, and so will delay the ability of farmers to confidently reach conclusions about climate change.

2.4. Climate change is spatially heterogeneous
Climate change impacts vary in different parts of the world to the extent that it may be adverse in some areas but beneficial in others. This interacts with uncertainty and slowness to increase farmers' difficulty in interpreting the extent of climate change impacts in different locations.

3. Policy Gaps and Options

There are two main types of climate change adaptation options: autonomous adaptation and planned adaptation. Autonomous adaptation is the reaction of farmers to weather patterns. For example, change of planting and harvesting dates in response to changing precipitation patterns. Planned adaptation measures are conscious policy options or response strategies, often multi-sectoral in nature, aimed at altering the adaptive capacity of the agricultural system or facilitating specific adaptations. For example, deliberate crops selection and distribution strategies across different agro-ecological zones, substitution of new crops for old ones and resource substitution induced by scarcity. The policy options we propose below fall within the scope of planned adaptation measures which should be heralded by governments of Central Africa.

3.1 Re-invigoration of Extension Services
Public agricultural extension and advisory systems is the main conduit for disseminating the information required for such decisions. However, in Central Africa, these systems have declined, their resources curtailed and their services outsourced to private sector or dropped. Where extension services are functional, focus has been on inputs (seed and fertilizer) to the detriment of market or commercial services. Effective adaptation to climate change by farmers requires policies that will increase the capacity of farmers to make both short and long term planning decisions and technology choices.

3.2 Networking and Agricultural Information Management Systems
In Central Africa, farmers have poor access to climate change information especially as it relates to agriculture. This creates a void that undermines the capacity of farmers to adapt to climate change. In most cases measures proposed by researchers and government officials have not benefitted the farmers because they are not aware of the constraints faced by the farmers. Networking and a functional information management system can close this information gap and consequently build trust and confidence among stakeholders. This will facilitate and improve the dissemination and access to scientific information that is essential for climate change adaptation. In addition, it will help mainstream the adaptation concerns into policy.

3.3. Planning
The general welfare of any country's citizens is the primary concern of the government. Governments therefore need to plan in order to enhance the process of adaptation to climate change. Climate change being a gradual phenomena, it may be possible to plan for holistic adaptive orientation to climate change that takes into account societal problems other than

climate change. This will justify and make relevant public spending in other domains of public interests.

3.4 Research and Development

Research is usually skewed towards the development of improved plant or animal species and novel farming systems that may be better adapted to changed climate conditions. Given the unpredictable future of climate conditions, such research needs to increase resilience across a range of potential climate conditions, rather than attempt to respond to particular climate prediction. To be adopted quickly, the technologies produced by this research will need to outcompete with current options under current climatic conditions. Most research carried out in this domain has long lead times. It may take 10 to 20 years for commercially viable varieties of novel plant species to reach the stage of widespread availability. Substantial changes to known species allowing novel applications (adaption to a new regional setting) can usually be achieved more rapidly, but rarely in less than a decade.

3.5 Provision of Incentive

Incentive payments should be given to farmers who have demonstrated ability to innovate climate change adaptation measures for increased food productivity and food security. Since most of the measures are autonomous, it is important to provide incentives as this can guarantee sustainability of innovations.

3.6 Infrastructure

Climate change may prompt a need for investment in infrastructure. In relation to agriculture, the most commonly discussed type of infrastructure relates to water storage and delivery. In Central Africa where there exist abundant water resources, storage may not be primordial. Delivery through irrigation schemes and improvement of roads will be beneficial. Communication infrastructure should be extended to the rural areas where most farmers are located. This will facilitate networking through mobile phones and as such enhance rapid information dissemination and exchange.

3.7 Finance

In Central Africa, public spending on agriculture is usually low (below 25% of the GDP). Majority of agricultural investments comes from private domestic sources including from farmers themselves and loans. Remittances from abroad significantly supplement domestic private funding. Sustainable development of agricultural innovations for climate change adaptation and food security is costly and requires large scale investment (FAO.2010). Meeting these financial challenges requires innovation, cooperative action and political will to urgently and adequately address current and projected shortfalls for adaptation and mitigation. Private financing alone is inadequate and public financing cannot single-handedly sustain the efforts. Public-private partnership is the gateway to sustainable funding.

4. Conclusion

This paper sought to find policies that can promote agricultural innovations for climate change adaptation and food security in Central Africa. Given the characteristics of climate change and policy gaps as shown above, it is imperative to pursue policy options to promote agricultural innovations adapted to climate change and food security in Central Africa. The following have been proposed:

1. Institutional and financial support is required to enable farmers make transition to planned adaptation strategies and improve on automated innovative strategies.
2. Strengthened institutional capacity (e.g. extension services) is needed to improve on the dissemination of climate information to agricultural stakeholders.
3. Greater network among agriculture, food security and climate change stakeholders is necessary at regional, national and international levels.

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