

salinity in East Africa agriculture.

3. Modalities for productive co-existence of farmers and pastoralists should be ensured to capitalize on the advantages of pastoralism in sustaining the natural environment.

4. Increased attention and appropriate action should be focused in deciphering how traditional gender roles and gender-differentiated vulnerabilities of many populations are impacting on men and women and the root causes in a bid to design better strategies for adaptation.

5. Appropriate links should be established and fostered among Public Private Partnerships to ensure sustainable agroforestry systems and carbon marketing

Recommended Reading

AfDB (2009) African Development Bank Data Platform, Tunis, Tunisia: African Development Bank
Emma T. Liwenga, Abdulai Jalloh and Hezron Moga (2014) Review of research and policies for climate change adaptation in the agriculture sector in East Africa. Future Agricultures Consortium (FAC). Working Paper 104. FAC, Brighton, UK. Pp45

FAO (2010) Climate Change Implications for Food Security and Natural Resource Management in Africa, paper presented at the Twenty-Sixth Regional Conference for Africa, 3-7 May, Luanda, Angola: Food and Agriculture Organization

Government of Burundi (2007) National Adaptation Programme of Action, Bujumbura, Burundi: Ministry for Land Management, Tourism and Development

Government of Kenya (2002) First National Communication of Kenya to the Conference of Parties to the United Nations Framework Convention on Climate Change, Nairobi, Kenya: Ministry of Environment and Natural Resources

IPCC (2007) Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge, UK: Cambridge University Press

World Bank (2007b) Accelerating Development Outcomes in Africa: Progress and Change in the Africa Action Plan, Washington, DC: The World Bank

About AfricalInteract : AfricalInteract is a platform enabling research-to-policy dialogue for adaptation to climate change among a broad range of African stakeholders in sub-Saharan Africa. These include civil society, researchers, policy-makers, donors, and the private sector working on adaptation to climate change in the agriculture and health sectors as well as urban areas with water and gender as cross cutting issues. The overall objective of AfricalInteract is to develop a platform for the effective and efficient transfer of information to policy makers, with the ultimate aim of enhancing the resilience of vulnerable populations. AfricalInteract is funded by the International Development Research Centre (IDRC) and coordinated by the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) under the auspices of the Forum for Agricultural Research in Africa (FARA). The regional focus of AfricalInteract is based on the Regional Economic Communities in the four sub regions of sub-Saharan Africa. Focal organizations coordinating regional activities are as follows: The Association for Strengthening Agricultural Research in East and Central Africa (ASARECA) – East Africa; Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) – Southern Africa; Commission des Forets d’Afrique Centrale (COMIFAC) – Central Africa; and Energie-Environnement et Developpement (Enda) – West Africa.



AfricalInteract

Policybrief

Enabling research-to-policy dialogue for adaptation to climate change in Africa

Research and Policies for Climate Change Adaptation in the East Africa Agriculture Sector

Context and Importance of climate change in East Africa Agriculture

Agriculture remains a key factor in East Africa, for spurring growth and lifting large numbers of people out of poverty. Rain-fed farming dominates the farming system in East Africa, and only a small area is irrigated (Rosegrant et al. 2002). Climate change is expected to challenge the adaptive capacities of many different communities, and overwhelm some, by exacerbating existing problems of food insecurity and water scarcity (Brown 2007). Severe droughts, floods and extreme weather events, associated with the climatic variability phenomenon of the El Niño Southern Oscillation, are occurring with greater frequency and intensity in the East Africa, worsening the state of food security and threatening all the other drivers of economic development in the region.



Climate models for the East African region show that rainfall regimes will change but these changes will vary with season and region. Warming is estimated at approximately 0.5°C per century since 1900 (Hulme et al. 2001). Temperature projections for East Africa indicate that the median near-surface temperature during the 2080–2099 periods will increase by 3-4°C compared to the 1980–1999 period. According to National Adaptation Program of Action reports in East Africa, climate change is expected to increase the frequency and intensity of extreme weather events such as droughts, floods, landslides and heat waves in the region.

Policy Brief N° 05 2009

1

Policy Brief N° 05 2009

4



Research on adaptation to climate change in the East Africa indicate that smallholder farmers have observed changes in the amount and distribution of precipitation, associated with increases in temperature (Komba and Muchapondwa 2012). Farmers' responses have involved using short season and drought-resistant crops, employing irrigation, adjusting planting dates and planting trees to manage the potential negative impacts of climate change on agricultural yields. Studies on potential impacts of climate change on crops in East Africa show that in Tanzania, positive and negative impacts may occur on different crops in the same small holder farming system. Impacts on maize will be strongly negative, while impacts on coffee and cotton, significant cash crops, may be positive (Agrawala et al. 2003). Results of research on the economics of climate change in East Africa reveal that major rainfall deficient years and the major macro variables show a significant relationship between rainfall amount and GDP (Seitz and Nyangena 2009).

Climate change and variability can impose additional pressures on water availability, water accessibility and water demand in the East African region. A regional analysis of climate change within the East African region shows that the supply and quality of water will both be affected (Seitz and Nyangena 2009). Climate change may have an impact on fisheries, as has been demonstrated for Lake Tanganyika by O'Reilly et al. (2003). These researchers concluded that primary productivity in Lake Tanganyika may have decreased by as much as 20 per cent over the past 200 years. Recent declines in fish abundance in East African Rift Valley lakes have also been associated with climatic impact on lake ecosystems.

The results of research on climate change adaptation strategies in Africa, will inform policy formulation and decision making for climate change adaptation. It is critical that agriculture sector policies are appropriately informed by the existing body of knowledge, generated from scientific research, on climate change and climate variability. These policies should enable the respective sectors to build resilience against climate change and climate variability through adequate adaptation strategies in order to achieve climate change mitigation through the use of improved and innovative technologies and management practices.

Regional policies related to Climate Change Adaptation in East Africa

Through the United Nations Framework Convention on Climate Change (UNFCCC) support to the Least Developed Countries (LDCs) in Africa to undertake National Adaptation Programmes of Action (NAPAs) included several countries in East Africa. As a result of this initiative Tanzania, Uganda, Rwanda and Burundi have highlighted priority areas in support of climate change adaptation. These priority areas include (i) improving food security in drought prone areas through improved water availability and cropping of drought tolerant crops, (ii) integrated water resource management, (iii) seasonal early warning, (iv) land use planning, (v) intensive livestock grazing, (vi) emphasis on indigenous knowledge (IK) and (vii) supporting non-agricultural income generating activities.

In response to a directive by the East African Community (EAC) Heads of State made during the 11th Summit of the Heads of State held in Arusha, Tanzania in 2009, development of the East African Community Climate Change Policy (EACCCP) was initiated to produce a regional climate change policy and strategies to urgently address the adverse impact of climate change on agriculture. The Policy is consistent with the fundamental principles of the Treaty establishing EAC and the principles of international environmental law consistent with the EAC Protocol on Environment and Natural Resources, the Protocol on Sustainable Development of Lake Victoria Basin and the UNFCCC. The Policy addresses the adverse impacts of climate change in East Africa to manage the increasing threats of the negative impacts of climate change to national and regional development programs.

Key research findings to be considered for informed decision making in climate change adaptation in East Africa

There is a growing number of research initiatives related to climate change adaptation in the East Africa region as well as in other regions that have potential to contribute towards adaptation to climate change in the region. The World Agroforestry Centre (ICRAF) is promoting a number of initiatives related to climate change adaptation. By yielding a broad range of products, including fruits, fuel wood,

timber and resins, agroforestry helps farmers to diversify their incomes, providing them with greater protection against market failures and climate fluctuations. The use of nitrogen-fixing trees and shrubs increases soil fertility and crop yields. Trees also help farmers adapt to climate change, as perennial crops are better able to cope with droughts and floods than annual crops. Trees sequester much greater quantities of carbon than annual crops, and in some instances provide farmers with access to the carbon market. Atel (2012) reports that depending on how it is designed; agricultural carbon finance presents an opportunity for climate justice for smallholder farmers who are most vulnerable to climate change, while addressing the mitigation challenge. The triple win of higher yields, climate-resilient farming and carbon sequestration is theoretically possible.

A study by Seo and Mendelsohn (2006a and 2006b), indicated that higher temperatures are beneficial in small farms that keep goats and sheep because it is easy to substitute animals that are heat-tolerant. Large farms, however, are more dependent on species such as cattle, which are not heat-tolerant. During periods of prolonged drought, agro-pastoral systems are put under stress and the people and livestock that depend on these systems experience increased vulnerability including reduced levels of food security. Increased frequency of extreme weather events including floods and droughts may overwhelm the existing resilience of pastoral systems. Increased precipitation is likely to be harmful to grazing animals because it implies a shift from grassland to forests and an increase in harmful disease vectors, and a shift from livestock to crops (IPCC 2007).

Raising livestock on drylands through seasonal migration is a uniquely efficient way to make use of lands that are unsuitable for other forms of agriculture (Neely et al. 2010). Rangeland resources are typically heterogeneous and dispersed, with their variation tied to seasonal patterns and variable climatic conditions. However, many researchers studying pastoral systems have concluded that extensive livestock production on communal land is the most appropriate use of semi-arid lands in Africa.

Policy options for consideration in the East Africa region

East African countries have developed policies and established institutions/structures for environmental management and climate change issues, but mainstreaming climate change matters in sectoral plans and programmes remains incomplete. Most of the policies and strategies of East African countries that were formulated before the introduction of the National Adaptation Programme of Action (NAPA), do not specifically incorporate climate change issues. However, policies and strategies articulate matters that may contribute to climate change adaptation and mitigation, and they have to be implemented in the context of the changing climate, which has significant implications for sustainable natural resources management, sustainable development and community livelihoods.

Combining local and scientific knowledge systems is important for making climate information relevant locally and for empowering communities, and is further necessary to enhance adaptation in the agricultural sector. Local adaptive capacity is enhanced by including communication and use of climate information in adaptation planning processes, enabling communities to live with the uncertainty and risks that climate change presents

Climate change adaptation is an evolving and cross-sectoral concern, which requires proactive, collective and gender response adaptation policies and measures in the agriculture sector. Gender roles and privileges vary from one location to another. Informed adaptation planning requires detailed gender analysis of each community. Sex-disaggregated data should be collected where possible to understand how men and women are impacted differently and how adaptation strategies may affect them directly. Analyses should include effective participatory processes that are gender responsive.

1. East African countries should increase efforts mainstreaming climate change into sectoral plans and programmes, as well as ensuring synergy among relevant sectors related to climate change adaptation.

2. Adequate support should be provided for the out scaling of climate smart agricultural technologies such as short duration and drought tolerant varieties of key crops to address changes in the length of growing seasons, increased droughts and periodic water logging as well as increased temperature and