

Climate Change Impacts on Food Security in Tanzania: A Policy Perspective

By Julius Peter Gontako and Aida Alli Gilla

Summary

Climate change is one of the most important factors to be addressed in food security as it has great impacts on the productivity and availability of food. Like other countries, Tanzania is striving to adopt different measures that could help reduce the impacts of climate change and improve the food security status of its people. This policy brief explores the status of food security, policy and regulatory frameworks, and challenges facing food security as a result of climate change. It recommends that public and private institutions support the agriculture sector, develop clear land use plans and strategies, enhance climate change coping mechanisms, strive for community engagement, and mainstream climate change into agriculture policies and strategies.

Introduction

Climate change (CC) is emerging as one of the most dangerous issues affecting many important sectors in the world, one of them being the agriculture sector. According to the CCAP (climate change, agriculture, and poverty alleviation) initiative (2013), CC has greatly affected crop production and productivity, increasing temperatures, pests and diseases, and the loss of plant and animal species.

In Tanzania, more than 70% of the population lives in rural areas and depends on rain fed agriculture as their main economic activity (Mayaya et al., 2014). CC impacts such as unpredictable rainfall patterns, insufficient soil moisture, increase in soil temperature and other social economic factors are what constrain the agricultural productivity in most of the sub-Saharan African countries including Tanzania (Midega et al., 2015; Thornton et al., 2018)

Also, a report from (Johnson, Nyomora, and Lyimo 2020) shows that the interaction between CC and variability with post-harvest is reduced specifically because of the monthly rainfall changes and annual temperature increases. This is why the agriculture sector is still characterized by low productivity caused

by low and erratic rainfall, extreme temperatures, prolonged droughts, a high rate of evapotranspiration, the eruption of climate-related pests and diseases, and the low moisture-holding capacity of the soils, which increases the threat to food security.

However, such climatic impacts will not affect the region uniformly due to the country's diverse climatic patterns, from equatorial to semiarid and arid climates. That is why communities living in these different climatic patterns will be affected differently by CC, and they will be adapting their systems of production to match the shortage of rainfall and other CC factors. Thus, Tanzania has and will continue to have some of the most complicated production systems in the world. They include systems such as perennial farming systems, mixed crop farming systems, and agropastoral and pastoral production systems.

Policy and Regulatory Frameworks on food security and climate change

National Land Policy (1997)

The policy does not clearly state the exact land use technique starting at the village level that can be used in areas of conflicting land use. Furthermore, despite being granted the right to own land, the policy does

not provide clear guidance on how farmers should use their land.

National Agriculture Policy (2013)

The policy recognizes CC as the primary cause of low crop production and productivity, and thus supports the development of irrigation systems as a means of dealing with frequent and intense climate change to increase crop production and ensure food security. The policy focuses on establishing a cost-sharing and cost-recovery mechanism for the development of the irrigation system in the country. This will help the small-scale farmers who use drip irrigation systems as their reliable irrigation system, i.e., grape farmers.

National Environmental Policy (2021)

The policy has addressed how an increase in temperature due to climate change has affected agricultural production, especially crop yield, livelihoods, and the national economy since agriculture is the backbone of the economy.

Agricultural Sector Development Programme Phase II (ASDP II)

The program aims at transforming the agricultural sector (crops, livestock, and fisheries) towards higher productivity, a higher level of commercialization, and smallholder farmer income for improved livelihood, food and nutrition security, and a greater contribution to the GDP. The program strategy is to gradually transform subsistence smallholders into sustainable commercial farmers by enhancing and activating sector drivers, supporting smallholder farmers to increase the productivity of target commodities within sustainable production systems, and forging sustainable market linkages for competitive surplus commercialization and value chain development.

Climate Smart Agriculture Guideline, 2017

The guideline acknowledges how the decrease and variability in rainfall, frequent droughts, and increase in temperature as a result of CC have affected agricultural productivity since agriculture in Tanzania is mainly rainfed. Thus, the guidelines suggested different adaptation and mitigation measures to reduce

the vulnerability of agriculture to climate change and ensure food security.

National Postharvest Management Strategy (NPHMS, 2019-2029)

According to NPHMS, 2019–2029, climate change affects the effectiveness of the strategies due to an increase in extreme weather events that lead to an outbreak of pests and diseases and moisture that creates fungal growth during the storage of crops. The strategy acknowledges the impacts of CC on food security and plans on promoting interventions to reduce climate change effects affecting the effectiveness of post-harvest technologies such as pest and disease management and harvesting and drying.

Postharvest Management Strategy Implementation Plan (PHMSIP, 2019-2024)

To cope with the effects of CC on food security, the implementation plan aims to ensure the availability of relevant information and early warning signs and introduce innovative postharvest CC resilience technologies and infrastructures.

National Climate Smart Agriculture Program (2015-2025)

The program explains how the dependency on climate has great impacts on agriculture production due to extreme weather events and unreliable variability in rainfall, with some areas having more rain and some having less. CC is also described as having impacts depending on the crop.

Tanzania Health National Adaptation Plan (HNAP) 2018-2023

Extreme weather events such as floods and droughts, temperature increases, and alterations in precipitation patterns are explained to have become a threat to food security both directly and indirectly. Thus, HNAP came up with an operational framework for building a climate-resilient health system to help cope with these impacts.

National Climate Change Response Strategy 2021-2026

The strategy addresses the impacts of CC on agriculture production and identifies adaptation strategies for short, medium, and long-term adaptation activities.

Food Security Status in Tanzania

❖ Food Availability

For food production to take place, resources such as water and land are of great importance. Due to the growing population in Tanzania and climate change, the pressure and demand for natural resources have increased. The effects of climate change have resulted in prolonged dry spells and erratic rainfall, resulting in low harvests and livestock losses. A report from ACAPS Tanzania (2022) shows that there is a reduction in the purchasing power of households due to an increase in the prices of food as a result of harvest failure. Thus, households tend to cut down on meals as a coping strategy. Also, an estimated 17% of the population in Tanzania was expected to be classified at crisis food insecurity level or worse between May and September 2022.

❖ Food Use and Utilization

How households use and utilize food in Tanzania is seen to change from three meals, two meals and one meal per day (with 3 meals decreasing and 2 and one meal increasing per day) depending on the storage of the harvested food, water and sanitation which are risk factors affecting food and nutrition security. Also the increase in price of food in 2022 has led to shortage of food in some households

❖ Food Access

For food to be accessible, there is a need for reliable infrastructure. With the drastic changes in the climate in Tanzania, i.e., floods, infrastructures such as roads tend to be destroyed, making it difficult for the farmers to reach the targeted market areas. This has led to the destruction of crops, especially in rural areas, due to a lack of good storage strategies and places to store the harvested crops.

Impacts of CC on Food Security in Tanzania

Impacts of CC on food security include;

- Decrease in income level and household stability.
- Decrease in food availability and production.
- Discourage investments in agriculture projects and threatens food safety e.g., food-borne diseases during storage.
- Death of crops, livestock, and people due to droughts and floods which becomes a threat to food security.
- Increased risks of food storage due to droughts and floods.
- Increase in poverty level especially in rural areas since most of the rural people depends on agriculture as their main source of income.
- Increase of weeds and harmful insects in crops.
- Increase the price of food
- Diminishing of water supplies.
- Reduced crop quality and quantity
- Increased hunger and poor nutrition in more vulnerable households.

Challenges Facing Food Security as a Result of CC

Food and nutrition security face different challenges due to CC impacts;

- Price fluctuation due to unpredictable yield of some crops during the seasons.
- Pests and diseases as a result of CC have led to low and poor production of crops.
- Inability to proper diet diversity due to unavailability of different foods as a result of CC.
- Poor rural infrastructures such as roads and storage facilities lead to a lack of access to agriculture inputs and market linkage.
- An increase in temperature as a result of CC leads to poor growth of some crops.
- Increase in resource competition due to scarcity such as land and water between farmers and pastoralists

- Limited awareness of the impacts of climate change among farmers greatly hinders their coping strategies against climate change.
- Increase in prices of agriculture products and services such as manure, irrigation facilities, and fumigation.
- Lack of proper postharvest strategies in rural areas and small-scale farmers.
- The community should engage in other non-agriculture sectors.
- Providing the community with information on CC to alert them on what type of crops they should cultivate and when.
- Promote the use of climate-smart agriculture.
- Educate the local farmers on the proper storage mechanisms of the crops after been harvested.
- Knowledge and education on the best post-harvesting techniques/strategies.

Recommendations

- Support from government officials and NGOs including a wide range of initiatives such as training; assistance in improving access to the market or access to inputs.
- Mainstreaming CC into agriculture policies and strategies.
- Clear land use plan policies and strategies and proper division of land starting from village level to avoid conflicts between pastoralists and farmers.
- Implementation of plans suggested from different strategies such as NPHMS, Climate Smart Agriculture guideline, and PHMSIP aiming at reducing the impacts of CC on the agriculture sector starting from ground level.
- Providing the community with CC coping mechanisms such as; Drought resistant seeds, Early maturing seeds, crop rotation, storage mechanisms, land fallowing, and weed control

Conclusion

CC affects mostly the semiarid region's food security in Tanzania in such a way that those who already suffer from poverty and hunger become more vulnerable to the added threats. CC impacts food security in its four dimensions: availability, access, utilization, and stability, both directly and indirectly. We, therefore, need to address and emphasize more the best adaptation strategies and measures that will be suitable to the community at risk/being affected. Also, the policies (land policy, environmental policy, and agriculture policy) should be clear on how the land should be used and what techniques should be applied to help the farmers cope with the effects they encounter from CC. Furthermore, an assessment of the existing capacities and activities of local authorities concerning climate change adaptation and mitigation measures is necessary to cope with the challenges facing food security in the country.

For Further Reading

1. Msafiri Y. Mkonda and Xinhua He (Sustainability 2017, 9, 1490): Yield of the major food crops: Implications to food security and policy in Tanzania's semi-arid Agro-Ecological Zone
2. Namkunda Johnson, Agnes Nyomora and James Lymo. Journal of Agricultural Biotechnology and Sustainable Development (2020): Assessing the impacts of climate change and variability on maize post-harvest system at Kongwa and Kondoa districts in Tanzania.
3. IPCC. 2014b. Climate change 2014: impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea & L.L. White, eds. Cambridge, UK, and New York, USA, Cambridge University Press. 1132 p

4. Baruani Iddi Baruani and Donati Alex Senzia, May 2013: study to generate recommendations on how district agricultural development plans [DADPs] can address climate change adaptation and mitigation in relation to small-scale farmers
5. Tanzania Food Security and Nutrition Analysis System - MUCHALI Tanzania, February 2017: Comprehensive Food Security and Nutrition Assessment Report

Tongyi Environmental Services Company Limited (TESCL)

P.O.BOX 233, Dodoma, Tanzania.

Umoja street, 2nd floor, KATO PLAZA

Tel: +255 738 197 775;

Email: info@tongi.co.tz

website: www.tongi.co.tz

