

# Annual Agricultural Policy Conference (AAPC)

## Policy Brief 8

### Climate Change Adaptation and Mitigation Policies in the Crops, Livestock and Fisheries Sector



Organized by the Policy Analysis Group (PAG) in collaboration with ASLMs.

**Dodoma, June 6<sup>th</sup> - 8<sup>th</sup>, 2022**

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## BACKGROUND AND CONTEXT

There is compelling evidence that Tanzania is already experiencing the negative impacts of climate change. Changes in precipitation patterns, rising temperatures, and extreme weather events pose an increasing threat to the country's economy. Among other sector economies, the agricultural sector is at the forefront of experiencing climate change's brutal impact. The sector's heavy reliance on rainfall and natural resources intensifies its vulnerability and further complicates the country's efforts to improve sector productivity. Agriculture remains a key driver of rural development employing 61 percent of the population while contributing 29 percent and 24 percent to the country's GDP and export earnings respectively (URT 2021a, URT 2021b). The agricultural sector's economic contribution warrants immediate action towards climate change adaptation and mitigation.

Climate change has been among the top global agendas in 2021, highlighted by the successful conclusion of the United Nations Climate Change Conference COP26 in Glasgow, Scotland, and the United Nations (UN) Food Systems Summit at the UN General Assembly in New York. Tanzania has been at the forefront in supporting the climate agenda. This is evident in a speech by Her Excellency Samia Suluhu Hassan, the President of the United Republic of Tanzania, at the United Nations General Assembly (UNGA). The President emphasized how climate change affects food security, livelihoods, and income across the globe, especially in developing countries. She pointed out the economic burden developing countries like Tanzania have to shoulder as a result of the effects of climate change, stating, "Tanzania government spends 2 to 3 percent of GDP to mitigate and build the resilience of communities, and this is a lot in a country that is still fighting against poverty".



Participants at the 8<sup>th</sup> AAGPC

In line with the Global and National Agenda on Climate Change, the theme of the 8th AAGPC intends to further emphasize the importance of this agenda to the Tanzanian economy.

Agriculture's vulnerability to climate change is further exacerbated by its heavy dependency on natural resources such as water and energy resources. Sustainable utilization of these resources is vital for the growth and sustainability of the sector and the economy in general. The sector is the largest user of freshwater, utilizing 70 percent of total global withdrawal, while more than one-fourth of energy used worldwide is an input for food production, distribution, and consumption (FAO 2014). In addition, food production and supply chain simultaneously utilize approximately 30 percent of the total energy used globally (FAO 2019). This emphasizes the importance of the water-food-energy nexus to sustainable development as the demand for all the three increases. The expected increase in agricultural production will bear heavily on Greenhouse Gas emissions and climate change.

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Panelists and Presenters of Thematic Area 2 at the 8<sup>th</sup> AAPC (including virtual panelist)

Tanzania has one of the most extensive forest covers in Eastern and Southern Africa. The country has 35.3 million hectares of forests, out of which 16 million hectares comprise of reserve forests, 2 million hectares are forests in national parks, and the remaining 17.3 million hectares (49% of all forestlands) are unprotected forests on public land (URT 2012). Despite a relatively high amount of forest stands, all are under significant threat of deforestation. The country has an annual deforestation rate of about one percent, around 400,000 hectares, twice the world rate of 0.5 percent per year. Between 1990 and 2010, Tanzania lost 19.4% of its forested land, equivalent to about 8 million hectares. There is very little remaining primary forest in the country, and the high deforestation rate is likely to lead to increased clearings (Project Gaia 2015). The main reasons for deforestation include clearing for agriculture and settlement, energy needs, and over-exploitation of wood resources for commercial purposes. These activities contribute a significant share to the increase of CO<sub>2</sub> in the atmosphere at a time when carbon sink is progressively reducing. Consequently, temperatures are projected to rise by 1.40C – 3.60C by 2080 throughout the country. Precipitation trends

will remain uncertain, and annual precipitation is expected to decrease by up to 42 mm by 2080 (GIZ 2021).

Climate change and climate variability create a ripple effect as temperatures rise due to reduced forest cover. Water resources in the country are also becoming more vulnerable. In the form of lakes, the country's freshwater reserves store approximately 29,425 km<sup>3</sup> of all the world's freshwater resources. This is about 25% of the world's fresh surface water. The reserve also includes water dams with a capacity of over 1,000,000 m<sup>3</sup>, six of these dams are currently used for hydroelectric power generation. The country also has a significant annual average renewable water resource of 126,262 mcm<sup>1</sup> per year, amounting to about 2,300 m<sup>3</sup> per capita, above the globally agreed Falkenmark Water Stress Indicator of 1700 m<sup>3</sup>/cap/yr (URT 2019a).

Despite the abundant water resources, the increasing water demand in the key economic sectors such as agriculture, energy, and manufacturing, alongside rising population growth requirements, show the country is moving toward a water deficit status. Tanzania's economy is already suffering directly from a lack of water. A study estimated that overall GDP growth in 2011 was reduced from 7 percent to 6.4 percent due to drought affecting water and hydropower. A 0.6 percent reduction in GDP corresponds to a \$142 million in 2011 prices. Based on average GDP per capita figures, this is equivalent to the contribution to GDP of over a quarter of a million people (2030WRG 2014). The future projection for the per capita average renewable water resources is expected to decline to below 1,700 m<sup>3</sup> per person by 2035 (URT 2019a). An increase in surface water

1 Million cubic meters

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Moments at the 8<sup>th</sup> AAPC

availability, particularly in the dry season, could be achieved by capturing water in storage reservoirs in the rainy seasons and promoting efficient water use technologies for the agricultural sector like micro-irrigation schemes.

Tanzania's energy sources include hydropower, natural gas, coal, biomass, solar, wind, geothermal, biomass, and tidal waves. Of all these, the biomass energy resource, which comprises fuelwood and charcoal, accounts for 85 percent of total energy consumption, of which 75 percent is consumed in rural areas, heavily contributing to deforestation (URT 2020). Natural gas and hydropower are significant sources of commercial energy in the country, comprising 94 percent of the total grid installed capacity in the country. It is reported that Tanzania has an estimated 7491 MW potential for hydropower capacity (URT 2020); however, only a tiny percentage has been tapped. Climate change has been one of the major constraints to achieving this potential, as drought conditions have led to a

significant decline in water levels in most hydropower stations. In a recent statement issued by Tanzania Electric Supply Company Limited (TANESCO) at the end of 2021, a drop in power generation is attributed to the declining water levels in hydropower rivers and dams. Daily power generation has dropped by 345 MW, equivalent to a 21 percent drop in daily power production (Mwananchi 2021). Blackouts and power rationing due to low water levels in the hydropower dams have forced TANESCO to rely on gas-powered generators. Power rationing for domestic and industrial use makes Tanzania's economy more vulnerable to climate change-related disasters.

Climate change also jeopardizes food security and nutrition. Every 1°C temperature increase is associated with a 1.64% global increase in the probability of severe food insecurity, which in turn drives up malnutrition (Romanello, 2021). The relationship between climate and the agriculture sector (crops, livestock, and fisheries) puts the food

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system and environment at risk as crop yield, crop nutrients, crop composition, crop quality, and density are all affected. This negative relationship leads to the availability, accessibility, and affordability of nutritious food being further impaired. Additionally, climate change affects the availability of safe and clean water, which is critical in reducing water-borne related diseases and improving water, sanitation, and hygiene practices (WASH) for improved nutrition. Less clean and safe water leaves communities with limited food and consumable water choices, thus increasing various forms of malnutrition such as Dietary Related Non-Communicable Diseases.

There is urgency in understanding the connections between agriculture (growing enough food) and its primary resources. Balancing rising energy needs and providing enough water for all sectors and domestic use remains central to climate change response and sustainable economic development.

Responses to climate change include adaptation, mainly to reduce the vulnerability of people and ecosystems to climatic changes, and mitigation, to reduce the magnitude of climate change impact in the long term. However, neither adaptation nor mitigation alone can offset all effects of climate change. It is necessary to focus on mitigation by



Hon. Hussein Bashe, Tanzanian Minister of Agriculture entering the conference venue with USAID Mission Director, Kate Somvongsiri. On the left, SERA BORA Chief of Party, David Nyange

reducing the emission level of gases contributing to global warming and adaptation by supporting local communities in dealing with the impact. To this effect, there is a need for adequate information to guide effective decision-making and policy interventions that can harmonize the use of critical resources within the agricultural production. The 8th AAPC will serve as a timely initiative to stimulate discussions on climate actions within the agricultural sector.

**The 8<sup>th</sup> AAPC looks into climate change and the Agricultural sector within five themes. The themes are:**

- Climate Change and Food Security
- Adaptation and Building Resilience
- Livestock Systems and Climate Change
- Innovations Toward Climate Change Mitigation
- Cross-cutting Issues

**Regional and Global Experience: Policies for Climate Change Adaptation and Mitigation**

At a global level, the threat of climate change is being addressed by the United Nations Framework Convention on Climate Change (UNFCCC) and its treaties. UNFCCC’s long-term objective is to combat “dangerous human interference with the climate system,” in part by stabilizing Greenhouse Gas (GHG) concentrations in the atmosphere (UNFCCC 1992). To ensure its objective’s attainment and further strengthen the Convention, UNFCCC adopted the Kyoto Protocol in the early 1990s. The treaty put in place legally binding emission reduction requirements for industrialized countries. The Kyoto Protocol was superseded by the Paris Agreement, which entered into force in 2016, aiming to increase governments’ ability to adapt to climate change effects and mobilize sufficient finance.

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Since the establishment of UNFCCC, most industrialized nations and developing countries have implemented climate change-related policies. Global policy recommendations on reducing GHG have focused mainly on using economically efficient market-based policy instruments, such as carbon taxes, fuel excise taxes, and emissions trading systems (OECD 2021). Other market-oriented policy instruments that countries have used include taxes on carbon or energy, the removal of environmentally harmful subsidies, tradable permit schemes, and the Kyoto Protocol flexibility mechanisms. Experience has shown governments often face significant opposition from affected industries when implementing policy instruments that affect company revenues and incomes. Best practices that countries have used to address competitiveness have often included recycling tax revenues back to the affected sectors while having in place policy incentives to minimize GHG emissions.

African countries contribute marginally to the changing climate, with just two to three percent of global emissions. However, it stands out disproportionately as the most vulnerable region in the world. This makes adaptation to climate change a primary concern for African countries, as reflected in the predominance of adaptation measures in their Nationally Determined Contributions (NDCs) (WMA 2021). Priorities identified in the NDCs of African countries reflect the heavy dependency on agriculture in African economies. Most countries' national climate change responses indicate a need for policy instruments that ensure early warning systems to help them to respond to weather, water, and climate-related hazards.

Nonetheless, successful adaptation and mitigation measures for major sectors like the agricultural sector also require greater policy attention to accelerate the uptake of existing green technologies and practices. This is evident in Ethiopia, where farmers have adopted a range of green technology and its practices, including altering crop varieties, adopting soil and water conservation, and changing planting and harvesting periods.

A survey of 48 crops grown in the Nile River basin of Ethiopia showed that farmers who took up adaptation methods produced between 93kg-300kg per hectare, more than those who did not alter their farming techniques, reflecting a 10-29% difference in output (Joto-Africa 2009). Factors that increased farmers' capacity to adapt included:

- Access to early warning systems and information on food prices and weather (even with simple text or voice messages to inform farmers on when to plant, irrigate or fertilize. That is, enabling climate-smart agriculture)
- Access to a well-informed extension service
- Access to climate-smart technologies, including sustainable agro-mechanization technologies, improved inputs, seeds, fertilizer

Under the Africa Adaptation Program (AAP), initiatives at the regional level have led to 16 countries incorporating climate change considerations into government investment plans. Kenya, for example, adopted the Threshold 21 (T21) model, which was integrated into the Ministry of State for Planning, National Development, and Vision 2030 in the Macro-Planning Directorate. The model is uniquely customized for the long-term integrated development planning and scenario analyses of climate adaptation options under uncertainties. The model also allows

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the cost of adaptation to be quantified, which is a pre-requirement for attracting financing for adaptation. In Niger, climate change resilience has been integrated through its Economic and Social Investment Plan. While the Government of Nigeria has integrated climate change into national macroeconomic policies (UNDP 2018).

## KEY POLICY QUESTIONS FOR DISCUSSION

Based on the theme and sub-theme for the 8<sup>th</sup> AAPC, the following are some of the critical questions that will be addressed during presentations and discussions:

- 1) How has Tanzania positioned itself to tackle climate change?
- 2) Is the agricultural sector adapting to climate change?
- 3) How can stakeholders sustainably finance the cost of climate change?
- 4) What lessons could Tanzania draw from other countries on climate change adaptation and mitigation for the agricultural sector?
- 5) How effective are existing policies on climate change mitigation?
- 6) Are there legal, regulatory, and institutional frameworks in place to implement climate change adaptation policies?
- 7) Do significant sector policies adequately integrate climate change adaptation and mitigation strategies?
- 8) Is cross-sectoral planning on climate change mitigation evident?
- 9) What is the institutional capacity and knowledge at the national and local level addressing climate change?
- 10) Is there enough research and data to inform the development of adaptive strategies within the agricultural sector?
- 11) How is the nutrition sector prepared to deal with climate change?
- 12) Are there any climate change adaptation policies to curb malnutrition?

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## ABOUT AAPC and PAG

The Annual Agricultural Policy Conference (AAPC) is organized by the Policy Analysis Group (PAG) in collaboration with the Ministry of Agriculture. The PAG is an informal (community of practice) and a voluntary group that consists of members working on agricultural policy projects/initiatives, academia, and local and international policy think tanks. Established in 2013, the group has about 20 members and provides a platform for sharing information on policy research findings to enhance coordination, collaboration, and synergy. The PAG also aims at ensuring consistency in policy messaging.

The AAPC brings together over 150 participants from academia, research institutions, policymakers, advocacy groups, and development practitioners from Tanzania in the region and beyond. The Conference provides an opportunity to assess progress in implementing policy reforms under the Comprehensive Africa Agricultural Development Programme (CAADP) framework of the New Alliance on Food Security and Nutrition. In addition, the Conference discusses successes, lessons learned, identified remaining gaps, how to increase competitiveness within the alliances, and emerging issues that require attention.



PAG members are deliberating at a PAG retreat on the 21<sup>st</sup> of January 2022. ASPIRES Tanzania hosted the event in Dar-es-Salaam

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The Policy Analysis Group (PAG) include the following:

- Aga Khan Foundation (AKDN)
- Agricultural Markets and Development Trust (AMDT)
- Agricultural Non-State Actors Forum (ANSAF)
- Agricultural Sector Lead Ministries (ASLMs)
- Agricultural Sector Policy and Institutional Reforms Strengthening (ASPIRES)
- Alliance for a Green Revolution in Africa (AGRA)
- Dalberg
- Eastern Africa Grain Council (EAGC)
- Economic and Social Research Foundation (ESRF)
- Feed the Future Tanzania
- Financial Sector Deepening Trust (FSDT)
- International Fund for Agricultural Development (IFAD)
- International Food Policy Research Institute (IFPRI)
- International Livestock Research Institute (ILRI)
- One Acre Fund (OAF)
- Policy Link
- Research on Poverty Alleviation (REPOA)
- Sokoine University of Agriculture (SUA)
- Southern Agricultural Growth Corridor of Tanzania (SAGCOT)
- Tanzania Horticultural Association (TAHA)

- TAHA Fresh
- Tanzania Private Sector Foundation (TPSF)
- Trademark East Africa

**Development Organizations who have been close partners to the PAG and financial contributors to AAPC through the years include:**

- Food and Agriculture Organization of the United Nations (FAO)
- Japan International Cooperation Agency (JICA)
- The World Bank
- UN Women
- USAID

**PAG also recognizes the close collaboration of corporate organizations who have supported and financially sponsored AAPC through the years:**

- CRDB
- National Microfinance Bank (NMB)
- PASSTRUST
- Tanzania Agricultural Development Bank (TADB)

### NUMBER OF ATTENDEES

The 8<sup>th</sup> AAPC was a hybrid event that brought together a total of about 332 participants with 257 physically attending and about 75 participating virtually for three days. The participants came from producers (farmers, livestock keepers and fisherfolks), academia, research institutions, politicians, policy makers, financial institutions, advocacy groups, development partners and media representatives.

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## EMERGING ISSUES

Out of the seven thematic areas, specific papers presented, panel discussions, questions, and commentaries, some clear key policy issues emerged. These are summarised below.

### I. Mitigating the Impact of Climate change, Covid-19, and the Russian – Ukrainian War

- As a result of these disasters, food prices (edible oils, wheat, and rice), fertilizer and transportation costs have increased by 80-100% over the year
- There is a need to support the establishment of large-scale farms and promote block farming, production of edible oils (sunflower and palm), wheat, soybeans, and other grains
- Propose to earmark the western zone - Rukwa, Katavi, Kigoma, and Kagera, as a strategic zone to cultivate these land-intensive crops. This region has the potential to produce all the food products we import
- Large-scale farms will be a driving force toward the growth of the agro-processing industry
- Ensure that production is focused on increasing productivity while safeguarding the environment through Climate-smart agriculture
- The Government should speed up its plan of establishing fertilizer processing plants using the discovered gas reserves. This is a critical period because of the high price of fertilizer and since the negotiations for investing in gas processing plants (LNG) have begun. The plants will enable fertilizer to be affordable for farmers, increase productivity, and create jobs in the value chain
- An alternative to the high prices of wheat could be a product that blends wheat with affordable cereals like sorghum
- Let Tanzania see these challenges as an opportunity

### 2. Minimizing the Effects of Climate Change and Enhancing Resilience

- Tanzania's agriculture is largely dependent on rainfall because only 3.5% of agricultural land is irrigated
- We commend the Government and the Ministry of Agriculture for increasing its budget for irrigation
- The concept of irrigation is broad; it includes rainwater harvesting for small ponds/dams as well as rainwater harvesting in homes and farms
- Irrigation infrastructure and other water infrastructure in urban and rural areas should consider the availability of water to livestock as well
- Tanzania loses 25-30% of grain post-harvest. This means that in 9 million tons of grain, we will likely lose 2 to 3 million tons. It is therefore essential to invest in crop storage infrastructure and technologies
- Crop storage will reduce the effects of climate change
- We commend the Ministry of Finance for the tax relief on cold chains. There is also a need for tax relief on grain storage technologies such as - silos, PICS bags
- There is a need to accelerate the enactment of the Agriculture Act. This law would oversee the implementation of policies, strategies, and programs for agricultural sector development. Neighboring countries like Kenya and South Africa have had this law for several years. In the United States, this law is known as the Farm Bill (Act); it has 12 chapters and is amended every five years

### 3. Livestock Systems

- The number of livestock exceeds the capacity of the land. Tanzania has 33 million herds of cattle, whereas best practice suggests 2 hectares per cattle, implying 66 million hectares are needed. Tanzania has 40 million hectares of agriculture, of which 17 million

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are used for crops. The remaining 23 million hectares are not enough for livestock. There is a need to look at incentives for livestock keepers to reduce large herds

- The Government should set aside forest reserves for nomadic pastoralists similar to reserves for wildlife and forests. These designated areas should have infrastructures such as livestock baths, ponds and water wells, veterinary services, and modern rangeland management. During drought, supplementary feed should be available at livestock centers to reduce livestock mortality. These reserved forests should be managed by rangers to control livestock theft or encroachment
- Water infrastructure should also provide services to aquaculture
- We commend the Ministry of Livestock and Fisheries for establishing a special department that manages infrastructure for the livestock sector, including livestock markets, dips, etc. We recommend that this be the first step towards establishing a livestock infrastructure agency similar to other rural infrastructure institutions such as TARURA, REA, RUWASA, and NIRC.

#### 4. Youth Involvement in Agriculture

- Youth and children (aged under 35) make up 77 percent of the Tanzania population
- Youth face four major challenges, including; access to skills, land, capital, and markets
- We commend the Ministry of Agriculture for launching a strategic youth entrepreneurship program known as 'Building a Better Tomorrow (BBT)' or Build Today for a Better Tomorrow
- Financial institutions do not recognize customary title deeds (CCROs) because, legally, they are governed by the Village Land Ownership Act (Village Act). If the borrower cannot repay the loan, the farm will be sold to a village resident only. There is a need for

CCROs to be regulated by the General Land Act to enable land to be used as collateral. Youth can easily get CCROs than Title Deeds

- For the youth to benefit from block farming, it is crucial to have a contract farming management policy
- It is also essential to have a farmland leasing contract because many youth rent land
- These two regulations can be included in the Agriculture Act
- The beekeeping sub-sector provides employment for the youth. It is important to include this sector in the strategy to develop the agricultural and livestock sector

#### 5. Access to Capital and Technology

- There is a need to build the capacity of financial institutions to be able to lend to the agricultural, livestock, and fisheries sectors
- Regulation Number of the Bank of Tanzania, responsible for the Financial Institutions and Credit Regulatory Act, guides the recognition of non-performing loans. This regulation includes loans for all sectors without regard to agriculture's value chain and production seasons. By this logic, the breeder is forced to start repaying the loan even before the calf is born and sells milk. There is a need to review this regulation
- The Ministry of Finance should expedite the reform processes for the Secured Transactions Law, which will enable movable assets to be used as collateral for loans. Many youths do not own land but have movable assets like motorcycles (boda boda) There is a need to develop a strategy for using ICT in the agricultural, livestock, and fisheries subsectors. There are various ongoing efforts, but they are uncoordinated despite the initial positive results. Most youths prefer the use of technology in their activities

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## 6. Cross-Cutting Policy Issues

- It is crucial to consider the aspect of nutrition in the whole agriculture and food system
- Malnutrition among children under 5 is still high in Tanzania. For example, stunting is 32%
- Areas that are self-sufficient in food are the ones with the highest malnutrition
- Soil health is vital in increasing productivity. We commend the Ministry of Agriculture for initiating a program to strengthen extension services, including distributing motorcycles and soil health testing equipment. There is also a need to allocate a budget to fund soil specialists to speed up the nationwide soil health screening exercise
- The Government should improve infrastructure for transporting agriculture, livestock, and fisheries products to regional and international markets to reduce the dependence on ports and airports of neighboring countries. For example, unloading a 50,000-ton ship at the Dar es Salaam port takes 2,000 vehicles, thus, bringing congestion to the port, delaying ships, and increasing shipping costs. If a conveyor belt were built, it would bring great relief



Kate Somvongsiri, USAID Mission Director, addresses the audience at the 8<sup>th</sup> AAPC

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