FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Ghana Climate Change Policy Brief

AGRICULTURE SECTOR

Introduction

Agriculture is a key driver of Ghana's economy, contributing an average of 20 percent of the country's gross domestic product (GDP) and providing livelihoods for the majority of Ghanaians, especially in rural areas.[1] Given the sector's heavy reliance on rain-fed production systems—less than five percent of arable land is irrigated (Ministry of Food and Agriculture, 2021[2])—climate change and climate variability are grave threats to Ghana's agricultural production and productivity. Significant changes in temperature and rainfall patterns—including shifts in when seasonal rains begin and end—have shortened the growing season and pushed farmers toward heat-tolerant crops that require less water. Climatic changes are also exacerbating the impact of non-climatic agricultural stressors, including soil erosion and degradation, on agricultural production. In addition, extreme weather events such as floods can destroy crops and damage infrastructure in a matter of hours or days. To reduce these and other impacts of climate change on agriculture—and help realize global food security targets (e.g., Sustainable Development Goal 2)—Ghana must identify and implement climate-resilient interventions.

This policy brief on the agriculture sector—part of a broader climate change assessment—details: (i) the impacts of climate change on the sector, (ii) the constraints to addressing these impacts, and (iii) recommended interventions to reduce these impacts and deliver a climate-resilient agricultural sector in the future.

Climate Change Impacts on the Agriculture Sector

The assessment revealed several impacts that climate change is having on the agriculture sector. These impacts, which are summarized below, include impacts farmers are currently experiencing as well as impacts predicted by climate models under future conditions.

Lower productivity. All stakeholders—farmers and non-farmers alike—said climate change and variability negatively affect agricultural productivity given current agricultural practices. In particular, stakeholders cited shifting and irregularly distributed rainfall patterns as the main causes for reduced yields. Studies integrating climate and crop models predict the situation will only worsen. Maize yields in certain parts of the country, for example, are projected to decline by between nine and 39 percent under various scenarios (Fredua et al., 2019[3]).

Climate Change Assessment

This policy brief on the agriculture sector is part of the Ghana Policy LINK Activity's broader climate change assessment, which focused on six key areas—agriculture, water, energy, forest, coastal systems, and climate finance. The assessment methodology included a literature review as well as inclusive stakeholder consultations through interviews, focus group discussions, and sector workshops in Tamale and Accra. The Ghana Policy LINK Activity consulted 43 institutions and groups, including USAID and its implementing partners, other development partners, the Government of Ghana, academia, civil society organizations, farmer groups, the private sector, and the media. The policy briefs will be used to further engage stakeholders to prioritize transformative actions to achieve a climate resilient future.

1 Ghana Employment in agriculture - data, chart | TheGlobalEconomy.com

2 Ministry of Food and Agriculture 2021 Annual Progress Report.

3 Freduah, B.S., MacCarthy, D.S., Adam, M., Ly, M., Ruane, A.C., Timpong-Jones, E.C., Traore, P.S., Boote, K.J., Porter, C. and Adiku, S.G., 2019. Sensitivity of maize yield in smallholder systems to climate scenarios in semi-arid regions of West Africa: Accounting for variability in farm management practices. Agronomy, 9(10), p.639.

USAID FROM THE AMERICAN PEOPLE

Policy LINK
LEADERSHIP & COLLABORATION FOR BETTER POLICY SYSTEMS

Crop failure and livestock mortality. More frequent extreme weather events such as floods and droughts have increased the incidence of crop failure and livestock mortality. Droughts and extended in-season dry spells, in particular, were cited by stakeholders as the main causes of reduced yields and crop failures. Extreme weather also increases livestock mortality: droughts limit the availability of pasture and water while extreme rainfall produces standing water that can contribute to disease outbreaks among livestock (the latter impact could worsen, as climate models predict more short-duration intense rainfalls and rising temperatures).

Degraded soils. Despite being a non-climatic stressor, soil degradation was identified as an impact of climate change and climate variability. Changing weather patterns, mainly rising temperatures and more intense rainfall (often leading to flash foods), are increasing soil erosion and soil degradation, causing the loss of arable land and essential soil nutrients (e.g., nitrogen).

Pest infestations. While crop pests have always been a challenge, the incidence of pest infestations—especially fall armyworm—has grown in recent years, a fact stakeholders blame on rising temperatures. Recent scientific studies (such as Early et al, 2018[4]) have confirmed this linkage. With climate models predicting that temperatures will continue to rise, Ghana could face a dire situation of increasing pest infestations.

Restricted crop choices. Shifts in seasonal rain patterns—later onset and earlier cessation of rains—have shortened the growing season. Farmers have adapted by switching to crops that mature more rapidly. Climate models predict the continuation of this shorter growing season, which, coupled with increasing temperatures, will further limit the crops that can be produced. This decrease in crop choice has implications for both livelihoods and nutrition, as some nutrition-dense crops such as soybeans may become impossible to grow.

Reduced cocoa pollination. Stakeholders mentioned that changing rainfall and temperature patterns are reducing the population of insect pollinators, which, in turn, reduces the productivity and production of cocoa, an important crop in Ghana's agriculture sector. While farmers can hand/self-pollinate, this practice is expensive (due to high labor costs), making it unsustainable as a long-term solution.

Constraints to Addressing Climate Change in the Agricultural Sector

The assessment highlighted several constraints to addressing climate change in the agriculture sector. These are categorized into six main areas, as described below.

Outdated policies. While most of Ghana's agriculture sector policies and plans address climate change, they would benefit from broadened scopes and greater integration of climate-smart technologies and indigenous risk management practices. The Climate Smart Agriculture Plan (2015), the Seed Policy (2010), and the Fertilizer Policy (2010) are among the plans and policies that require revision.

"Climate change will only amplify the need for timely, accurate information on in-season weather variability, especially as the weather becomes more unpredictable."

Weak agriculture extension services. Ghana's agriculture extension services—which should support farmers as they adapt to climatic impacts—are technically weak. Extension agents have a limited understanding of climate-smart technologies, and most are not trained to interpret weather and climate information and advise farmers accordingly. Moreover, the number of extension agents is inadequate: the current agent-farmer ratio is 1:709, compared to a recommended 1:500 (Ministry of Food and Agriculture, 2021[5]).

Limited access to to appropriately packaged climate information services. Climate information services (CIS) and risk mitigation mechanisms enable farmers to make informed decisions about which crops to plant and when. They also help farmers understand the best agricultural practices for coping with climate change and variability. Climate change will only amplify the need for timely, accurate information on in-season weather variability, especially as the weather becomes more unpredictable. These services and tools are not only inappropriately packaged but can also be difficult to access. Often, smallholder farmers cannot afford technologies such as mobile phones that put real-time information at their fingertips; in addition, traditional and cultural norms limit women's access to CIS.

Limited access to agricultural insurance. Agricultural insurance is an essential part of a sound agricultural risk mitigation strategy. Even though farmers would benefit from insurance, they often lack awareness of its benefits and access to these services. Climate change—which will increase the risks inherent in rainfed agriculture—makes it more important than ever that this critical risk mitigation measure be more widely available and accessible.

4 Early, R., González-Moreno, P., Murphy, S.T. and Day, R., 2018. Forecasting the global extent of invasion of the cereal pest Spodoptera frugiperda, the fall armyworm. bioRxiv, p.391847.

5 Ministry of Food and Agriculture 2021 Annual Progress Report

Limited engagement and awareness. The policy-making process, including for agriculture and climate change, does not sufficiently include key stakeholders, especially those most affected by these policies, such as farmers, vulnerable groups, and the private sector. As a result, these stakeholders are not aware of these policies' provisions or benefits. For example, there is limited engagement of local actors in developing or introducing agricultural technologies and practices, especially those that build on indigenous knowledge and practices. Climate change amplifies the need for the inclusion and participation of all stakeholders in the policy process.

Limited access to land. Ghana's complex land tenure system makes it difficult not only to access land for agriculture but also to practice sustainable intensification. Multiple sales (i.e., selling the same land serveral times) and difficulties in obtaining titles for agricultural lands are examples. Traditional and cultural norms also limit access to land, especially for women. These challenges, coupled with climatic changes such as high temperatures, low rainfall, and droughts, have led to increased cultivation on marginal, less productive lands.

Recommended Interventions

To reduce the impact of climate change and climate variability on the agriculture sector and increase the resilience and capacities of vulnerable groups, stakeholders recommended the following interventions:

Policy reviews. Stakeholders recommended revising relevant agriculture sector policies to integrate concrete approaches and strategies for addressing climate change. The Climate Smart Agriculture Plan of 2015, for example, needs revision to identify and promote climate-smart production technologies and practices that achieve both mitigation and adaptation targets. The Seed Policy of 2010, meanwhile, should outline approaches to facilitate the production, marketing, and increased accessibility to certified, stress-tolerant seed (e.g., drought tolerant and early maturing seed). And the Fertilizer Policy of 2010 should be revised to promote the production and use of organic fertilizers.

Climate information and agronomic advisory services. Stakeholders recommended developing and scaling innovative strategies to increase access to CIS, especially among smallholder farmers (including women), who may be unable to access these services on an individual basis. Strengthening the capacity of farmer-based organizations to provide better services to their members, for example, could be a strategy for connecting vulnerable farmers to CIS. Messages disseminated through rural radio, mobile phone-based interactive voice response systems, and/or churches and mosques could also help equip farmers with timely climate information and advisory services.

Agricultural insurance. Stakeholders recommended strategies to raise awareness of the benefits of agricultural insurance among smallholder farmers, who are especially vulnerable to climatic changes. These strategies, which also seek to make insurance more accessible to smallholder farmers, include: (i) advocating that the government integrate agricultural insurance into its flagship programs (e.g., Planting for Food and Jobs) and (ii) bundling insurance with other services or inputs farmers are already paying for and using.

Sustainable land and water management practices. Stakeholders recommended scaling up the use of sustainable land and water management practices that have proven successful in specific areas but have not yet been widely adopted. These practices, many of which are rooted in indigenous knowledge, include zero tillage, *zai* (planting) pits, and contour bunds. Stakeholders recommended identifying these and other locally successful sustainable land and water management technologies, practices, and strategies, as well as addressing barriers to widespread replication.

Integrated soil fertility management. Stakeholders recommended identifying and scaling up soil management strategies that reduce soil degradation and increase fertility and moisture retention. These strategies include promoting residue retention on fields by identifying and enabling the production of alternative materials (to the use of residue), increased use of organic fertilizers, and construction of structures that retain water and reduce soil nutrient loss through leaching and erosion.

Awareness, education, and incentives. Stakeholders highlighted the importance of behavior change in mitigating climate change risks. Behavior change begins with increased awareness, especially among subnational actors (including farmers and vulnerable groups), of sector policies, plans, and strategies; climate-smart technologies and services; and sustainable land and water management practices. In addition, the government plays an important role in catalyzing behavior change. Stakeholders recommended that government programs should include incentives in policies, plans, and strategies—and make them known—that encourage farmers to adopt sustainable practices and technologies that will strengthen their resilience.

Technical and human capacity. While stakeholders recommended strengthening the capacity of all value chain actors, they emphasized supporting agricultural extension agents, in particular, as they work most closely with smallholder farmers. Among other areas, research institutes need support to develop new technologies targeted at reducing or managing climate-related risks to agriculture; while agricultural extension agencies need training to interpret seasonal weather forecasts and explaining them to farmers; they also need exposure to climate-smart agriculture practices that would benefit farmers. Ghana must also increase the number of