

Ghana Agricultural Sector Risk Assessment

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In Ghana, the agricultural sector remains the backbone of the economy. Nearly two decades of productivity growth, beginning in the early 1990s, has helped put Ghana back on a path to recovery following more than a decade of economic uncertainty. With the exception of millet and sorghum, output for most crops has increased at a faster rate than population growth. During the 18-year period between 1993 and 2010, the sector experienced only 1 year (2007) of negative growth. During the same period, it recorded 3 years when growth exceeded 7 percent. The sector's remarkable recovery, facilitated in part by sustained public and private sector investments, has helped pull thousands of rural households out of extreme poverty. In the early 1990s, nearly two out of every three (63.6 percent) rural Ghanaians lived below the national poverty line. By 2006, the ratio had dropped to roughly two in five (39.2 percent). Ghana is now well on track to reach the first Millennium Development Goal to halve poverty by 2015.

BACKGROUND

Sustaining the sector's growth trajectory is a top priority for President John Dramani Mahama, who won election in 2012, and his administration. Success will depend, in part, on the government's ability to manage the country's ongoing transition to a more diversified economy while ensuring that the country's smallholder farmers, food processors, and other sector actors have what they need to remain competitive. It also hinges upon the ability of all stakeholders to recognize, respond, and adapt to a changing landscape: one characterized by climate change, increasing weather variability, increasing threats

from pests and diseases, and higher food price volatility, among other risks. The catastrophic flooding of 2007 and more recent food price shocks served as stark reminders of the importance of effective risk management. The government recognizes more than ever the need to strengthen existing risk management systems to ensure continued sector growth, and more importantly, to protect the most vulnerable communities and strengthen their resilience to future shocks.

Improved agricultural risk management is one of the core enabling actions of the Group of Eight's New Alliance for Food Security and Nutrition.

The World Bank's Agricultural Risk Management Team conducted a risk assessment to better understand the dynamics of agricultural risks and identify appropriate responses, incorporate agricultural risk perspective into decision-making, and build capacity of local stakeholders in risk assessment and risk management.

The objective of this assessment was to assist Ghana's government to i) identify, analyze, quantify, and prioritize the principal risks facing the agricultural sector (that is, production, market, and enabling environment risks); ii) analyze the impact of these risks on key sector stakeholder groups (for example, farmers, vulnerable populations, food processors, government); and iii) identify and prioritize appropriate risk management interventions (that is, mitigation, transfer, coping) that will help improve stability, reduce vulnerability, and increase the resilience of agricultural systems.

The assessment covered priority crops (and livestock) that are most important to farming families and other stakeholders in Ghana. This Note presents a summary of the assessment's key findings.

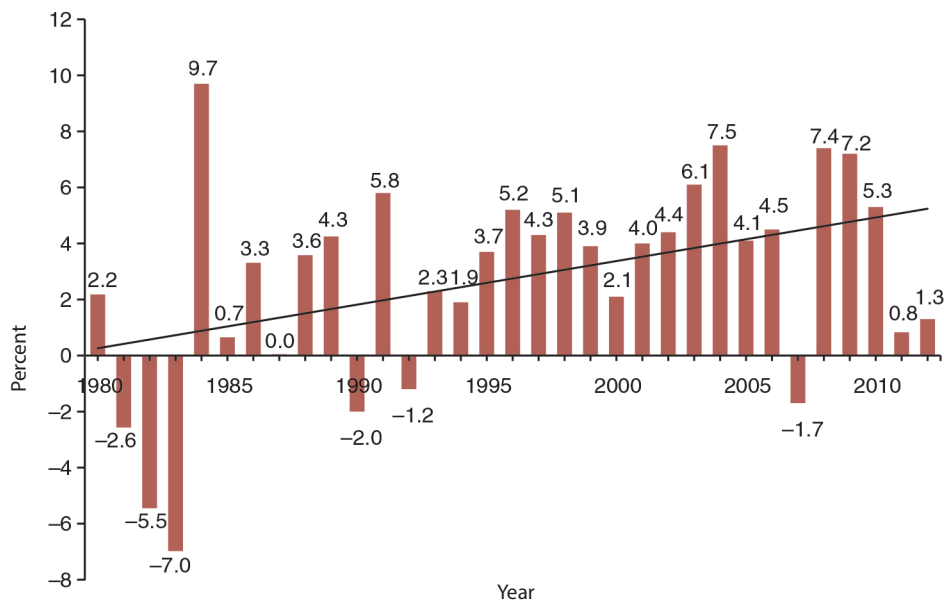
MAJOR RISKS

Production Risks

Given Ghana's heavy reliance on rain-fed agriculture, drought causes the highest level of cumulative losses with the greatest impact on livelihoods, particularly in the northern savannah zones. Drought events are most likely to affect sorghum, millet, maize, and groundnut production. In addition, flash flooding resulting from excessive rainfall occurs with relative frequency across Ghana, but rarely causes widespread destruction. Crops most affected include cassava, rice, yams, and groundnuts. Existing capacity among stakeholders to mitigate such risks or cope in their aftermath is severely limited.

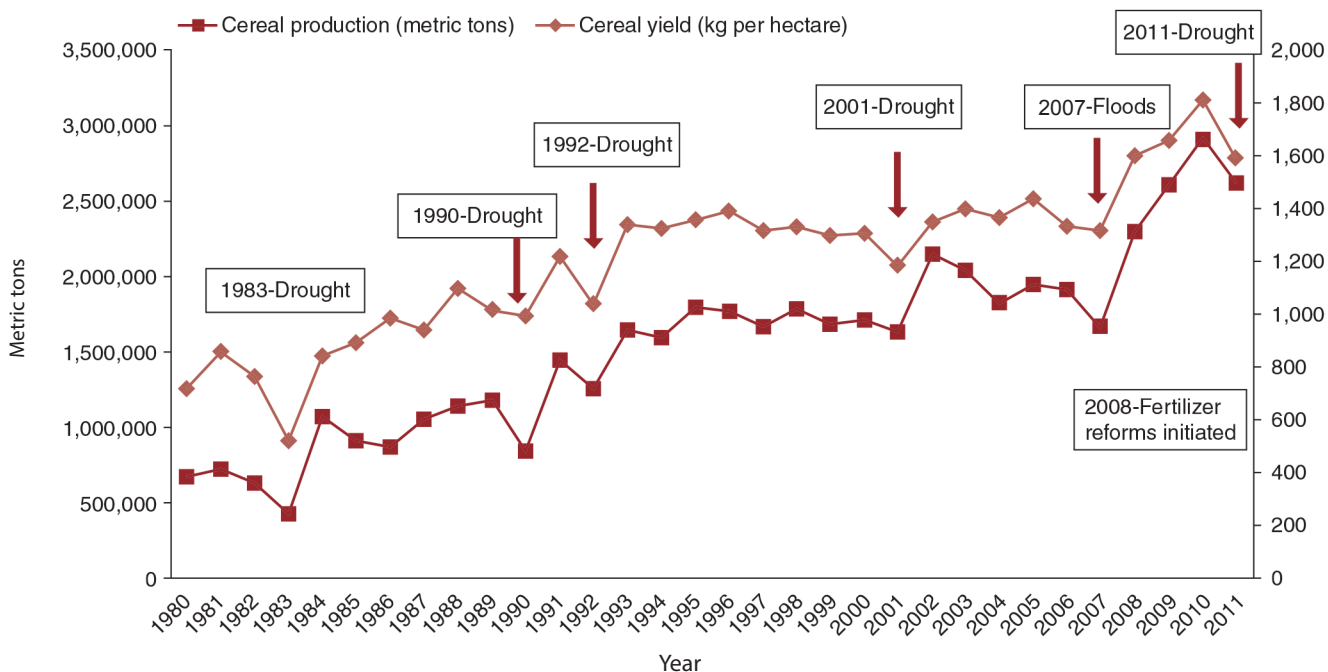
Posing a constant threat to both crops and livestock, pests and diseases constitute the second most important production risk after drought. Cassava, cocoa, and plantain are among those crops most susceptible to attack. However, current control measures, in some cases with cocoa and cassava, have been relatively effective.

FIGURE 1: Agricultural Sector Growth (%) 1980–2012



Source: Data from Bank of Ghana 2013.

FIGURE 2: Impact of risks on cereal production and yields, 1990–2011



Source: FAOSTAT; authors' notes

Market Risks

Price volatility poses the most important market risk facing agricultural stakeholders. This is especially true for maize; growing maize exports in recent years have contributed to higher levels of price volatility in domestic food markets. In addition to maize, plantain, cassava, and yams are among the crops most susceptible to adverse impacts from price variability.

Enabling Environment Risks

Among enabling environment risks, the assessment calls attention to concerns over weak capacity among state-level institutions tasked to manage and respond to the most important risks facing the agricultural sector. First, the analysis calls into question the Ghana Cocoa Board's (COCOBOD's) ability to move forward to effectively manage both production and price risk for cocoa; this is occurring within a context of declining international prices and current budget shortfalls. Second, the assessment raises questions over the National Disaster Management Organization's

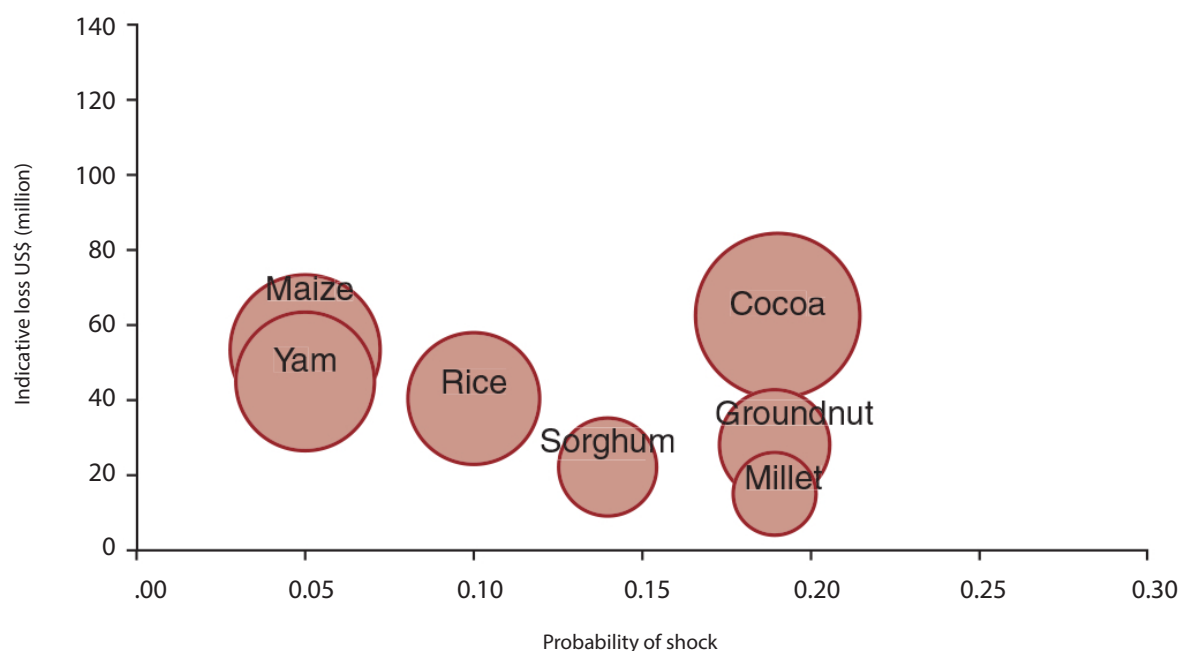
operational funding and its capacity to respond to multiple risk events.

ADVERSE IMPACTS

The analysis shows that although risk is a permanent feature of agriculture in Ghana, its impact on output and growth is relatively low at the national level. In the 1980–2012 period, agricultural sector growth was positive in 24 out of 31 years (figure 1). Certain inherent strengths reduce the sector's overall vulnerability to risk while limiting associated losses. First, the diversity of agro-climatic conditions in Ghana, of production systems, and of the crops and seeds used within those systems lowers the level of aggregate risk for the agricultural sector as a whole. Second, this diversity reduces impacts on livelihoods when production shocks occur. However, the causes, frequency, and severity of risks vary between regions, commodities, and years, with important implications for risk management.

Adverse events occur in most years for some

FIGURE 3: Frequency and severity of adverse production events by crop



Source: FAOSTAT; authors' calculations

regions and commodities. These events are usually offset by above-trend production in other regions and other crops, thereby reducing the overall impact of risk at the national level. Figure 2 highlights the adverse impact of droughts and flood on national cereal production and yield, particularly in 2007.

Disaggregated analysis by region and by crop showed a much higher frequency of adverse production and price events. Indicative losses were also proportionally much higher than losses at the sector level. Analysis of adverse production events by crop provides insight into crop-specific risk. The probability of a production shock during the 21-year period analyzed (1991–2011), and the average indicative cost of these shocks is illustrated in figure 3.

Vulnerability

At the local level, frequent risk occurrence causes significant income volatility for low-income rural households. Risk events are the principal

cause of transient food insecurity, especially in the northern regions. Multiple shocks cause the greatest losses, particularly when they are precipitated by drought or other weather-related risk events. For example, widespread wildfires in 1983 following a severe, multi-year drought (1981–82) caused colossal crop losses, including 60,000 hectares of cocoa trees. Catastrophic flooding in 2007 following prolonged drought conditions resulted in negative sector growth for the first time since 1994.

Low-income, rural households, particularly in the northern regions, are most susceptible to production and price shocks. With scant coping capacity, they are also the most vulnerable to the impacts of such shocks. Regional risk analysis showed that the Upper East, Upper West, and Northern regions are most prone to drought and flooding, whereas the Eastern Region is relatively susceptible to fluctuations in maize and cassava production.



Photo credit: Neil Palmer / International Center for Tropical Agriculture (CIAT)

RISK MANAGEMENT

To identify an effective risk management strategy that maximizes available resources, it is necessary to prioritize risks based on frequency and severity of impact. Using quantitative and qualitative methods to assess risk occurrence and impacts, this prioritization identified 1) drought, 2) pests and diseases, and 3) price volatility as the most important risks to Ghana's agricultural sector. Flooding from excessive rainfall and bushfires associated with drought were also deemed important, but to a lesser extent.

Based on the risk prioritization, the regional distribution of vulnerability to risks, and consultations with local stakeholders, actions in three interconnected risk management solutions areas are recommended: 1) water management, 2) pest and disease management, and 3) agricultural extension and innovation systems. The assessment identified and prioritized appropriate risk manage-

ment interventions in these areas to improve stability, reduce vulnerability, and increase the resilience of agricultural systems.

1. Improved water management

Effective water management will be a fundamental building block to address drought and flood risk in Ghana. The Government of Ghana, farmers, and development partners have already undertaken a large number of initiatives, many quite successful, to improve water management. Despite these initiatives, water resource management remains suboptimal, and losses from drought and floods remain high. To address the deficits in existing water resource management, the following interventions are recommended:

- Scale-up dissemination and implementation of soil and water management practices (e.g. contour bunds, grass stripping, crop residue management, cover cropping, pit composting, planting pits, agro-forestry, alley



cropping, enclosures, rainwater harvesting, etc.) These are decentralized, low-cost, and localized interventions that have been proven to improve yields and reduce losses.

- Introduce flood retention reservoirs on the White Volta River and establish flood warning systems, buffer zones, and dikes. These measures and harmonized data systems for information monitoring and sharing will help reduce losses due to floods.
- Develop small- and micro-scale pump-based irrigation and inland valleys using bunding, leveling, and puddling technology.
- Invest in medium- to large-scale irrigation and drainage schemes, which emphasize water-use efficiency, and rehabilitate existing schemes in strategic locations.
- Improve transboundary water resource management and effective implementation of buffer-zone policy to protect,

regenerate, and maintain the vegetation surrounding waterways in order to improve water quality.

- Strengthen the current enabling environment and institutional structure of water management in Ghana. This will require more efficient collaboration between relevant actors in the sector, including the irrigation authority, the Ministry of Food and Agriculture, the Water Resource Commission, and the Department of Cooperatives.

2. Improved pest and disease management

Pest and disease outbreaks are a major production risk, with severe consequences for sector stakeholders. Under climate change, the incidence and severity of pests and diseases is expected to shift, increasing the potential for new and more damaging types of outbreaks. Ghana needs a functional plant protection system that can forecast and manage the risk of

crop pests and diseases. To create a more effective and more responsive system, the following is recommended:

- Strengthen the diagnostic, analytical, and managerial capacity of the Plant Protection and Regulatory Services Directorate, the principal agency responsible for plant protection in Ghana.
- Implement early warning systems and surveillance, including: calamity pest surveillance (e.g. of variegated grasshoppers and African armyworms). This requires real-time monitoring of key parameters; training local communities in diagnostics, surveillance, and communications; and implementing an early detection and management system.
- Improve farmers' access to knowledge of improved pest and disease management practices through multiple channels (extension, ICT, input dealers, farmer field schools, etc.). Relevant packages of IPM practices and guidelines tailored to specific regions and crops need to be developed and disseminated to farmers through these channels.
- Invest in research on innovative pest and disease management technologies and disease-resistant seed varieties to develop holistic plant health management strategies for the major crops. This is especially relevant in the context of climate change, which is expected to alter the incidence and severity of pests and diseases and to facilitate their spread to new territories.

3. Improved agricultural extension and innovation systems

Farmers are at the front lines of risk management, however, they are often constrained by a lack of information about context-specific best practices to manage risks in their fields. An improved agricultural extension and innovation system is at the center of enabling farmers to manage risks by a) providing a package of location- and crop-specific practices for managing risks; b) helping farmers

access resources to implement the package of practices; and c) providing real-time advisory and trouble-shooting support.

- Formulate a national agricultural extension policy. Extension reforms need to establish clear roles and responsibilities of different organizations involved in agricultural research and extension.
- Develop common guidelines for creating public-private partnership (PPP) mechanisms for delivering extension services.
- Establish knowledge management units with sufficient infrastructure (communication units, print, video editing, ICT facilities, etc.) in research and extension institutes for collecting, digitizing, creating databases, and linking with the national agricultural knowledge portal.
- Facilitate information aggregation and dissemination systems integrated with ICT (including farmer learning videos), radio, and traditional extension systems.
- Scale up delivery of traditional extension services such as field demonstrations, field visits, and awareness programs, as well as farmer-to-farmer approaches.
- Revitalize farmer-based organizations (FBO) created by past development projects.



Photo credit: Consortium of International Agricultural Research Centers (CGIAR)

- Create and improve public-private partnerships (PPP) in research and extension. There is an existing mechanism for PPPs, the Research Extension Linkage Committee, which could be improved through regular meetings and additional resources.
- Encourage research and extension providers to collaborate and share resources with the Ghana Meteorological Agency to set-up a national network of agro-meteorology and weather forecasting.

NEXT STEPS

There is no single measure to manage all risks; effective risk management requires a combination of coordinated measures. Some are designed to remove underlying constraints; others are designed to directly address a risk or a subset of risks. Available resources are often a limiting

factor, but integrated risk management strategies are often more effective than one-off or stand-alone programs. The interventions recommended here should be implemented as part of a holistic risk management strategy that takes into account the interlinkages between different types or risks.

It is expected that this analysis will inform Ghana's Medium-Term Agricultural Sector Investment Plan and assist policymakers in building sector resilience. Managing risk is an ongoing, dynamic process that requires long-term commitment and real-time monitoring to enable appropriate actions in short, medium, and long term. This risk assessment has provided an analytical approach and an operational framework to understand and prioritize risks and solutions. The process needs to be continued by local stakeholders who ultimately have ownership over risk management in Ghana.

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