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AGRICULTURE GLOBAL PRACTICE NOTE 10

Tanzania Agricultural Sector Risk Assessment

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Despite Tanzania's comparative advantage in the production of many crops (cashew nuts, coffee, cotton, tea, tobacco, maize, and rice, for example) and the relative abundance of natural resources, 38 percent of the rural population, or 13 million rural inhabitants, live below the poverty line. Agricultural gross domestic product (GDP) grew at an annual average rate of 4 percent between 2005 and 2012, which is significant but below the 6 percent target set by the Comprehensive Africa Agriculture Development Programme. Most small-scale farmers in Tanzania still use low-input technologies that result in poor yields and scanty economic returns while facing high production volatility, high price volatility, and limited incentives to invest.

BACKGROUND

In 2001, the government established the Agricultural Sector Development Strategy (ASDS). The ASDS highlights the key constraints to achieving agricultural growth targets, among them "un-managed risks with significant exposure to variability in weather patterns with periodic droughts." The Agricultural Sector Development Program (ASDP) Framework and Process Document (2005) provides the guiding framework for implementing the ASDS. Development activities at the national level are to be based on the strategic plans of the line ministries while activities at the district level are to be implemented by local government authorities. The ASDP components are to be financed through a basket fund. Currently, there is an attempt to link risk management interventions to the new ASDP.

The Agricultural Risk Management Team of the World Bank's Agriculture Global Practice conducted a risk assessment to evaluate and prioritize agricultural risks in Tanzania and to identify potential risk management solutions. The findings of this assessment aim at informing Tanzania's new ASDP.

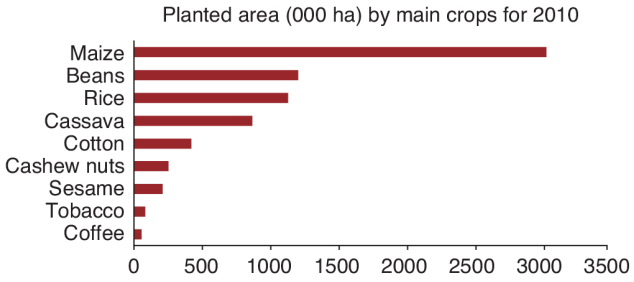
Tanzanian agriculture has not suffered catastrophic natural or artificial events at the national level during the past 20 years, and that is reflected in the agricultural GDP growth rate, which has never been negative during that period. However, aggregated figures at the national and sector levels tend to mask volatility at the regional level and within individual crop supply chains, which in turn hide fundamental vulnerabilities. As was highlighted by the ASDS, such volatility represents an important constraint to growth and poverty reduction.

MAJOR RISKS

Stakeholders identified unreliable rainfall in terms of intensity and distribution as one of the most likely and damaging production risks to agriculture. Drought is also recognized as a severe risk that occurs with lower frequency while retaining the potential to severely affect agriculture. Pests and diseases are also important production risks that cause yield volatility and, occasionally, can result in severe and extensive damage to agriculture when outbreaks occur. However, their damage potential varies greatly among crops and depends in part on the quality of the risk management actions, if any, that are in place.

Price volatility is a key market risk in Tanzania and is particularly present in coffee and export crops, where interannual domestic price changes are strongly correlated with the high international price volatility of these commodities. Monthly coffee price changes in New York between January 1988 and December 2012 are shown in figure 2. The series standard deviation is more than 8 percent. Transmission of interannual international price changes to domestic producer prices is high, making all actors in the value chain vulnerable to volatility in the

FIGURE 1: Planted Area

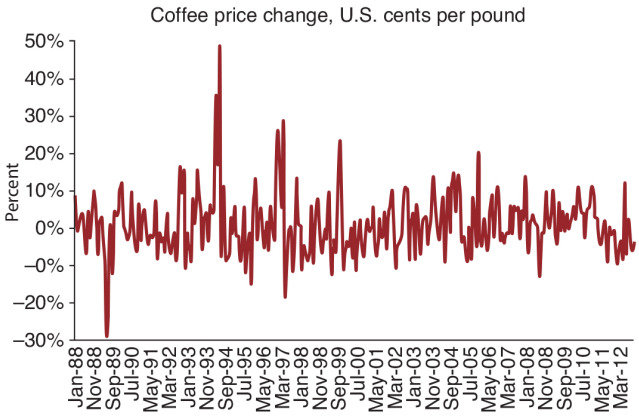


Source: MAFC

international markets. Figure 3 illustrates the quasiperfect price transmission effect on the prices received by the Rural Meru Cooperative Society from Singisi, Arusha, as compared with the New York cash price over the past 20 years.

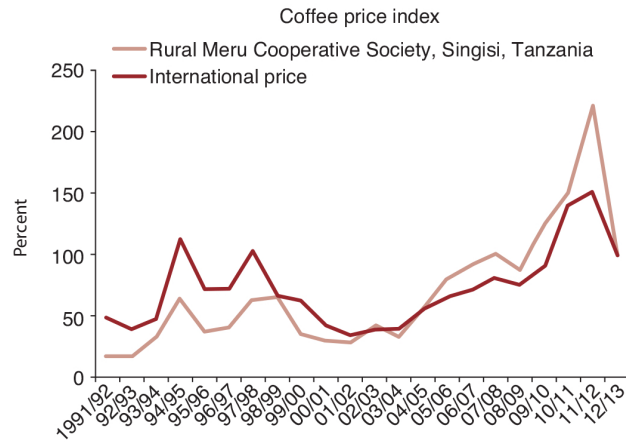
Supply chain actors with low capacity to manage volatility, particularly farmers, are negatively affected by sudden price fluctuations. The enabling environment is another source of risk. For the purpose of this analysis, enabling environment risk refers to the set of conditions that facilitate the efficient performance of business along the supply chain, among which public policy and regulation are the most prominent. In Tanzania, the most important enabling environment risks are changes in regulation affecting the marketing system and

FIGURE 2: International coffee price change



Source: International Coffee Organization: Coffee, Other mild Arabica, New York cash price, ex-dock.

FIGURE 3: Coffee international-domestic price compariason



Source: International Coffee Organization: Coffee, Other mild Arabica, New York cash price, ex-dock.

Photo credit: Anne Wangalachi/CIMMYT

the functioning of supply chain stakeholders; decision-making processes of primary societies in their intermediary roles; and logistic disruptions in the supply, access, and availability of inputs to agriculture.

ADVERSE IMPACTS

The value of average annual production losses in the agricultural sector as a result of unmanaged production risks has been estimated at approximately US$203 million, or 3.5 percent of agricultural GDP. The calculation involves the following crops: tobacco, coffee, cotton, cashew nuts, sesame, maize, rice, beans, and cassava, which in aggregate make up more than 80 percent of agricultural GDP.

Drought was the main cause of these shocks, sometimes in combination with other events. With regard to maize, more than 40 percent of losses over a 30-year period are concentrated in Mbeya, Manyara, Shinyanga, and Iringa. Kilimanjaro and Arusha have also been adversely affected by production volatility. Altogether, the six regions account for 61 percent of all losses.

How the losses are distributed among stakeholders within the supply chain is to a great extent a function of value chain governance and the actors' capabilities and opportunities for risk management. Some exporters, millers, and large trading companies are able to hedge price risks globally through the practice of standard futures risk management strategies. The great majority of farmers, traders, and cooperatives are highly exposed to price risk, largely through a lack of risk management practices and knowledge. Primary cooperative societies, ginners, and other procurement agents involved in export crops take significant risks when they make advance payments to farmers or keep the products in storage until delivery in the auction (coffee) or to the exporting companies (cotton). Small-scale farmers' capacity to protect themselves against price risk is extremely limited. Primary cooperative societies are also the weakest segment in the supply chain. Product price variations within the marketing year can expose primary cooperative societies relying on multi-payment systems to financial losses.

All actors along the supply chains are exposed to the variability in primary farming production. However, smallholder farmers are particularly vulnerable to production and yield variability. Their monetary income, family food security, and household wellbeing are extremely dependent on the crop harvest. Thus, to mitigate potentially catastrophic weather and pest and disease risks at the farm level, many producers adopt low-risk and low-yield crop and production patterns to ensure minimum volumes for food security purposes.

RISK PRIORITIZATION

The identified risks were prioritized according to the frequency of realized risk events, their capacity to cause losses, and the ability shown by the different stakeholders to manage the risks. The prioritization exercise indicated that the following

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were the major risks causing losses to the agricultural sector: drought events mainly for maize, rice, and cotton; widespread outbreaks of pest and diseases especially for cotton, maize, and coffee; price volatility for cotton and coffee; and regulatory risks, mostly within the trade policy framework, for various cash crops and for maize. Although these risks do not necessarily manifest themselves in the form of catastrophic shocks to agriculture as mentioned above, they are identified as the main drivers of agricultural GDP volatility that cause income instability and recurrent food security problems among stakeholders.

RISK MANAGEMENT

Based on the results of the risk prioritization and interviews with stakeholders, the assessment team identified four areas for risk management interventions 1) seed supply chains 2) agricultural technology innovation 3) maize trade policy and 4) price risk management for export crops. The team's recommendations to improve risk management focus on capacity building, investment, and the regulatory framework.

1. Seed supply chains

Clean, healthy planting material can improve and stabilize yields, reduce the risk of spreading pests and diseases to new areas, and support growth in crop production and enterprise. Currently, 75 percent of farmers in Tanzania still save their seed, and certified seed sales are low compared to neighboring countries. There are ongoing Government, donor, and grassroots efforts aimed at strengthening farmers' awareness of improved seeds and linking informal seed systems with formal institutions. However, complimentary actions are needed to strengthen seed supply chains for producing and disseminating

drought-tolerant seeds, disease-resistant seeds, and planting material. To fill gaps in existing efforts to strengthen seed supply chains in Tanzania, the following is recommended:

Strengthen National Agricultural Research Institutes (NARIs)

- Invest in irrigation and cold storage capacity, including electricity for the NARIs, starting with the main zonal centers. MAFC estimates that adding irrigation at NARIs could reduce varietal release time by half. Until these necessary improvements are made, seed production will remain unstable and vulnerable.
- Increase NARI staffing levels immediately and scale-up the mentor program to prepare for a wave of retirements. This will allow overlap between seasoned researchers and new employees. To incentivize employment for recent graduates, ensure that NARI salaries are competitive with university salaries.

Strengthen the Agricultural Seed Agency (ASA)

- Invest in basic infrastructure to help ASA meet its heavy mandate, including irrigation at ASA seed farms and decentralized storage locations to facilitate transport in high demand areas.
- Encourage more congenial Public Private Partnerships (PPP) through clearer policies.
- To fully maximize infrastructure investments, ASA could use the irrigated farms and storage to expand their arrangement of renting to private seed companies, a role which they said they would gladly magnify and which could help ease PPP strain.
- Develop a transparent strategy that outlines how and when ASA will transition seed production over to private companies, as intended.

Enable private sector growth

- Invest in irrigation for out growers so that production can increase and stabilize on available land.
- Support public institutions like the Tanzania Official Seed Certification Institute (TOSCI) to increase regulation of seed and agro dealers. This includes increasing TOSCI staffing, training inspectors, and regularly evaluating inspectors' performance.
- Enhance extension services so that seed education is not left to uninformed or profit-incentivized agro-dealers.
- Link seed production more directly to commercial processing to entice private companies to pursue expanding their crop portfolio beyond maize.

2. Agricultural Innovation System (AIS)

The use of good agricultural practices (GAPs) and improved agricultural technologies (IATs) can significantly reduce impacts from production risks such as drought, irregular rainfall, and pests and diseases. Most of these GAPs and IATs are well known to agricultural researchers around the world and in Tanzania, however, adoption remains very low. The organizations and institutions that comprise Tanzania's agricultural innovation system have an important role to play in disseminating new technologies and practices to farmers. Some of these GAPs/IATs need to be further refined and adapted to local conditions. Others need to be promoted through farmer training on appropriate use and potential benefits. In order to strengthen the agricultural innovation system and successfully scale up the use of GAPS and IATs, the following is recommended:

Strengthen the National Agricultural Research System (NARS)

- Establish an autonomous Tanzanian Agricultural Research Council responsible for coordinating all agricultural research in the country, including research prioritization, core funding for priority research, capacity development of scientists, and development of relevant technologies for use by farmers. This is absolutely essential for revitalizing the NARS in Tanzania.

Photo credit: Scott Wallace/World Bank

- Establish a framework and strengthen capacity to undertake priority research related to adaptation to climate change (including drought), mitigation of agricultural risks, and the effects of pesticide use on food safety and human health.
- Provide technical assistance to researchers to enable them to develop and test "ready to use" GAPs and IATs for adoption by farmers. Train new scientists (MS and PhD degrees) in scarce and critical disciplines, and strengthen research linkages with CGIAR institutes.

Revitalize agricultural extension services and policy

- Promote the use of Information and Communication Technology (ICT) to complement the existing extension approach and reach farmers in remote areas. This will include the use of smart phones, tablets, computers, electronic commodity innovation platforms (websites) and fully equipped agricultural information centers.
- Promote the establishment of private agricultural advisory services as a business. For example, the Kilicafe farmers' association Kilicafe provides extension services to smallholder growers.
- Improve the performance of the existing extension system. This will require additional funding and training of extension agents.

Modernize the National Agricultural Training System (NATS)

- Provide incentives to the NATS centers graduates to establish their own businesses providing private agricultural advisory services to farmers and agribusiness. MAFC should not be the only employer/client.
- Upgrade training facilities, including classrooms, labs, equipment, computers, internet and training material to improve the overall

quality of training, including training in ICT. The overall budget needs to be increased so agricultural training centers are able to renovate their facilities and hire well qualified staff.

- Carry out needs assessments at each training center to determine the requirements for advisory services at present, as well as in the next 20 years. Staffing and curriculums must be updated in response to the needs assessment. There is an emerging need for training related to ICT, M&E, high-value agriculture, value chains, climate change, and production risk mitigation.
- Open trainings to private extension agents and progressive farmers (farming as a business), based on consultations with the management of Kilimo Kawanza, SAGCOT, and other private sector stakeholders to determine demand.

3. Maize trade policy

Current maize trade policy adds market volatility to the normal production (climatic and sanitary) risks because of the variability and unpredictability of the norms restricting trade and the way regulations are enforced. Given that most of the limited maize traded in the market is consumed in towns, this policy is to a great extent biased in favor of urban consumers. Maize supply support measures have focused mainly on production support (e.g. input distribution in the form of vouchers) and less on policies that encourage a market-based supply response. In practice, trade regulations have tended to restrict rather than promote trade. In order to allow Tanzanian farmers to benefit from new market opportunities, the following is recommended:

Establish a predictable and transparent maize trade regime

- Commit to not impose export/import bans and to eliminate trade permits, maintaining only normal phyto-sanitary and tax payment regulations.
- Restrict and control district levies.
- Concentrate National Food Reserve Agency operation in emergency distribution and social programs, with maize purchases subject to a bidding process to reduce market distortions.
- Establish a market information system to improve price transparency for stakeholders.

4. Price risk management for export crops

Risk management strategies for high-priced, volatile export crops (principally coffee and cotton) are needed to reduce exposure to price risk, particularly for the most vulnerable stakeholders in the supply chains. The following recommendations are aimed at the three participants in the marking chain facing the greatest exposure to export crop price volatility risk: growers, cooperatives/farmers' groups, and banks.

Price risk management solutions for the coffee sector

- Continue existing efforts to provide coffee-specific extension services, improve product quality, diversify small farmer incomes, and promote certification schemes.
- Improve access to, and the quality of, up-to-date market information.
- Streamline the decision-making process within cooperatives, primary societies, and farmers' groups for setting prices. Today's cooperative managers need to have the power to set prices in response to rapidly-changing market conditions.
- Provide training aimed at lending institutions and cooperatives/farmers' groups on price risk management and on basic business management.
- Establish specialized agricultural commodity units in banks, designed to facilitate access to agricultural price risk management mechanisms and to provide an active business mentor to assist and monitor their clients' price risk exposure.

Price risk management solutions for the cotton sector

- Promote sector consolidation through licensing authority. To be competitive through economies of scale, the Tanzanian cotton sector must reduce the number of ginners and middlemen.
- Ban defaulters (ginning companies on ICA default list should not be licensed).
- Revise floor price periodically during the season, in response to changing market conditions.
- Develop a price-setting formula to improve predictability based on fair allocation of revenues and risks between producers and ginners.
- Promote strong farmer-ginner relationships to foster improved access to agricultural extension services, farm inputs and credit facilities (contract farming) rather than pursuing intermittent relationships through middlemen.
- Build capacity of producers to increase their bargaining power. Priority should be given to training producer groups to progressively take over primary marketing of seed cotton, in order to bring transparency and reduce the number of intermediaries.

NEXT STEPS

This assessment added to the existing knowledge base on Tanzania's agricultural sector by systematically analyzing a range of risks and impacts over a 30-year period. The assessment recommendations should inform the design of a holistic agricultural risk management strategy that takes into account the linkages between different types of risks. An agricultural risk management plan would ideally include actions in all four of the intervention areas identified above.

In addition to improving risk management, these actions would make a significant contribution to improving agricultural productivity and therefore promote sector growth and national food security. They may be regarded as the basis for designing the Agriculture Sector Development Programme's risk management module.

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