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SERA POLICY PROJECT FINAL REPORT

TANZANIA ENABLING POLICY ENVIRONMENT FOR AGRICULTURAL SECTOR GROWTH

APRIL 7, 2011 – AUGUST 30, 2016

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SERA POLICY PROJECT

FINAL REPORT

Contract No. 621-C-00-11-00003-00
USAID Feed the Future SERA Policy Project
Tanzania Enabling Policy Environment for Agricultural Sector Growth

Implemented by Booz Allen Hamilton

DISCLAIMER

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ABBREVIATIONS AND ACRONYMS

ACT	Agricultural Council of Tanzania
AgCLIR	Agricultural Commercial, Legal, and Institutional Reform
AIRD	Associates for International Resources and Development
ANSAF	Agriculture Non-State Actors Forum
ASDP	Agricultural Sector Development Program
ASPIRE	Agriculture Sector Policy, Institutional and Regulatory Strengthening
BRN	Big Results Now
BOT	Bank of Tanzania
CAADP	Comprehensive Africa Agriculture Development Program
CBAP	Capacity-Building Action Plan
CEO	Chief Executive Officer
CET	Common External Tariff
CI	Custom Indicator
CLIR	Commercial, Legal, and Institutional Reform
COP	Chief of Party
DAEA	Department of Agricultural Economics and Agribusiness
DCOP	Deputy Chief of Party
DFS	Department of Food Security
DPP	Department of Policy and Planning
EAC	East African Community
EAGC	East African Grains Council
ENGINE	Enabling Growth through Investment and Enterprise
ERS	Economic Research Service
ESRF	Economic and Social Research Foundation
EWU	Early Warning Unit
FAO	Food and Agriculture Organization
FBM	Food Basket Methodology
FEWSNET	Famine Early Warning Systems Network
FSND	Department of Food Security and Nutrition
FtF	Feed the Future
FtFMS	Feed the Future Monitoring System
FUM	Farmers Union of Malawi
GDP	Gross Domestic Product
GOT	Government of the United Republic of Tanzania
HEA	Household Economic Approach
HHS	Household Budget Survey
iAGRI	USAID Feed the Future Research and Education Project

IFC	International Finance Corporation
IFM	Institute of Financial Management
IFPRI	International Food Policy Research Institute
IR	Intermediate Result
ISTA	International Seed Testing Association
LOP	Life of Project
MAFAP	Monitoring African Food and Agricultural Policies Project
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MALF	Ministry of Agriculture, Livestock and Fisheries
MANR	Ministry of Agriculture and Natural Resources of Zanzibar
MIT	Ministry of Industry and Trade
MIU	Market Intelligence Unit
MLHSD	Ministry of Lands, Housing and Human Settlements Development
MOF	Ministry of Finance
MSME	Micro, Small and Medium Enterprise
MSU	Michigan State University
MT	Metric Ton
MVIWATA	National Network of Farmer's Group in Tanzania
NA	Not applicable
NAFAKA	USAID Feed the Future Staples Value Chain Project
NASFAM	National Association of Small Farmers
NBS	National Bureau of Statistics
NEPAD	New Partnership for Africa's Development
NFRA	National Food Reserve Agency
NFSD	National Food Security Department
NGO	Non-governmental organization
OECD	Organization for Economic Cooperation and Development
PAC	Partnership Accountability Committee
PAG	Policy Agricultural Group
PAPAC	Platform for Agricultural Policy Analysis and Coordination
PDB	President's Delivery Bureau
PMO	Prime Minister's Office
PRU	Policy Research Unit
PS	Permanent Secretary
RATIN	Regional Agricultural Trade Intelligence Network
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
REPOA	Research on Poverty Alleviation
RCT	Rice Council of Tanzania
RGOZ	Revolutionary Government of Zanzibar

RUDI	Rural Urban Development Initiative
SADC	Southern African Development Community
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SERA	USAID Feed the Future Policy Project
SME	Small and Medium-sized Enterprise
SRI	Strategic Rice Intensification
SUA	Sokoine University
TAFSIP	Tanzania Agriculture and Food Security Investment Plan
TAHA	Tanzania Horticulture Association
TANDREC	Tanzania Disaster Relief Executive Committee
TASAF	Tanzanian Social Action Fund
TASTA	Tanzania Seed Trade Association
TBD	To be determined
TIC	Tanzania Investment Centre
TOSCI	Tanzania Official Seed Certification Institute
UPOV	International Union for the Protection of New Varieties of Plants
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USG	United States Government
VAT	Value Added Tax
WB	World Bank
WFP	World Food Programme

EXECUTIVE SUMMARY

The USAID-funded Tanzania SERA Policy Project provided research on over eighteen different policies that affected agriculture during the five and one-half year life of the project. It also improved the capacity of Tanzanians to undertake policy analysis and advocate for an improved policy environment. The impacts of this research and enhanced capacity has been to improve the current policy environment, better the ability to monitor and respond to food security challenges and market opportunities, and provide a basis for which for future improvements in the policy environment can be advanced.

The most significant improvement to the current policy environment came from research on the impacts of the food crops export ban which led the GOT to lift the export ban in 2012. This provided farmers with better market opportunities and higher prices for their marketed maize and other food crops. SERA research showed that an export ban reduced farm-gate prices by about 25 percent and as a result of the SERA research there has not been an export ban since 2012, compared to five in the six years prior to 2012. This led to better prices since 2012 and provided incentives for farmers to increase production, increase investments, and provide a better life for their families. The financial impact of lifting the export ban is difficult to measure, but the loss to farmers from the 2011 export ban was estimated to be USD200 million. Tanzania has recorded consecutive good harvests since the export ban was lifted and that was due in part to the lifting of the export ban. There is a regional shortage of maize in 2016, and if the Government were to ban exports, it would result in large losses as in 2011, while increasing illegal exporting and encouraging corruption.

SERA research also contributed to a better understanding of food security and the ability to monitor food costs at the regional level in Tanzania, and contributed to the establishment of a Market Intelligence Unit that will be able to continue that effort in the future. Among the important findings was that diets in Tanzania are quite diversified and no single food item accounts for more than 15 percent of the cost of the typical food basket. Prices of major food items are not highly correlated which means consumers can adjust to changing prices by switching to other food items which have not experienced large price increases. SERA research on food demand also identified those foods that are expected to have rapid demand growth in the future and that information can be used to guide future investments so that the food system meets the needs of the population.

SERA support for a better policy environment for the agriculture sector will continue through producer organizations that were strengthened and reforms that were started by SERA and will continue after SERA has closed. These include an improved working relationship between the private seed companies and the GOT, the strengthening of the producer and industry associations (Rice Council of Tanzania and the Agriculture Council of Tanzania), and planned reforms of the secured transactions law and the establishment of a collateral registry by the Bank of Tanzania (BoT). Strong producer associations can raise policy concerns with Government and influence these policies as was recently demonstrated by the Rice Council when they raised the issue of illegal rice imports. Contributing to better dialogue between the seed industry and the

GOT is important because it will lead to greater availability of improved seeds which have been shown to result in a 30 percent increase in crop yields. Improved credit to smallholders and SMEs will increase the ability of smallholders to finance investments and increase productivity, and SERA efforts led the BoT to prioritize this activity and the World Bank to support implementation.

SERA research also examined other important issues such as gender, the agriculture business environment, emergency food imports, and maize and rice market performance. The study on gender showed that female-headed households are severely disadvantaged compared to male-headed households with respect to land holdings, input use, yields, production, prices received, and incomes. This research could be used to support the development of specialized extension programs to focus on female farmers and reduce their poverty. The study of the agriculture business environment showed that Tanzania is not competitive in attracting foreign investors and new incentives are needed. This research also largely explains why the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) has not been able to attract foreign investors and it is unlikely to be successful in the future without major reforms. It is conceivable that if this study had been conducted before the SAGCOT initiative was started, the outcome may have been very different. The study of the emergency food import policy recommended the establishment of a Market Intelligence Unit to monitor food prices and that unit is being established and training was provided by SERA project. The studies of market efficiency showed that prices are slow to adjust to regional price changes and better information systems and better internal transport would result in higher prices to farmers and lower prices to consumers.

I. INTRODUCTION

The SERA Policy Project is a five year, USD8.5 million Feed the Future (FtF) activity in Tanzania.¹ The SERA Project began in April 2011 and was implemented by Booz Allen Hamilton and its local partner, Diligent Consulting Ltd. As one of eight projects in the Tanzania FtF initiative, SERA's objectives focused on improving agricultural policies and developing the capacity of local institutions and individuals to undertake policy research and advocate for policy reform.

II. IMPLEMENTATION OBJECTIVES AND STRATEGIES

A. Project Objectives

The purpose of the SERA Project was to develop a policy partnership among all stakeholders to achieve key policy reforms in the agricultural sector and business environment that would ensure the successful implementation of Tanzania's Agricultural Investment Plan. A key component of this plan was the public-private sector partnership—the Southern Agricultural Growth Corridor of Tanzania. The mandate for SERA and all of the FtF projects was to devote at least 80 percent of their resources to supporting SAGCOT, which was focused on promoting investments in the high agricultural-potential corridor that extended from the Indian Ocean near Dar es Salaam to the Southern Highlands, and on commercializing agriculture by attracting foreign investors into

¹ Modification 5 restored funding from award ceiling of \$5.1m to \$8.5m in April 2014. Modification 8 provided for a no-cost extension to August 2016.

the sector. Those investors were expected to provide marketing and processing services for smallholder farmers who would produce as outgrowers. SAGCOT targeted food crops including maize, rice, and horticulture, and SERA focused its activities on those crops. The Tanzania FtF initiative targeted the mainland and Zanzibar.

The project design established five objective areas intended to strengthen the capacity of the Government of the United Republic of Tanzania (GOT) institutions, the private sector, and other stakeholders to undertake policy research and implement policy changes. The five objective areas focused on: partnership development, policy analysis and research, capacity building, program reforms, and communications and outreach. These policy objective areas supported the Comprehensive Africa Agriculture Development Program (CAADP) process, addressed constraints to growth, identified and analyzed policy constraints, and promoted dialogue among stakeholders. The SERA Project activities provided evidence-based research to fill knowledge gaps, inform policy dialogue, facilitate engagement, and support reforms through capacity building, and outreach and communications. Specific project achievements are presented in Section III.

1. Partnership Development

Partnership development was critical for SERA Project success. SERA sought to establish strong working relationships and partnerships with existing consortiums' stakeholders and institutions. Existing institutions and partners provided the best entrée point for establishing long-term working relationships with public-sector institutions, private-sector stakeholders, and other donors.

The SERA Project worked closely with Tanzania's research institutions including the Economic and Social Research Foundation (ESRF), Research on Poverty Alleviation (REPOA), and the Institute of Financial Management (IFM) on research and capacity-building activities. The SERA

Project also worked with international organizations including the International Food Policy Research Institute (IFPRI) and the World Bank Group.

SERA Project Tanzanian Partners

- Agricultural Council of Tanzania (ACT)
- Rural Urban Development Initiative (RUDI)
- National Network of Farmer's Groups in Tanzania (MVIWATA).
- Rice Council of Tanzania (RCT)
- Tanzania Private Sector Foundation (TPSF)
- Research on Poverty Alleviation (REPOA)
- Economic and Social Research Foundation (ESRF)
- Policy Forum
- Sokoine University of Agriculture (SUA)
- Southern Agricultural Growth Corridor of Tanzania (SAGCOT)
- Haki Ardhi
- Ministry of Agriculture, Livestock and Fisheries (MALF)
- International Food Policy Research Institute (IFPRI)
- Southern Africa Development Community (SADC)
- East African Community (EAC)
- Food and Agriculture Organization (FAO)
- East African Grains Council (EAGC)
- Regional Strategic Analysis and Knowledge Support System (ReSAKSS)
- Tanzania Seed Traders Association (TASTA)

SERA policy work required close collaboration with government institutions, specifically the National Food Security Division (NFSD) and the Department of Policy and Planning in the Ministry of Agriculture, Livestock and Fisheries Development (MALF).²

In addition, the SERA Project found that existing private-sector organizations had well-established networks and partnerships with organizations such as the Tanzania Seed Traders Association (TASTA). The goal of TASTA was to improve the private-sector seed industry, and SERA supported that goal by sponsoring workshops with the industry and government. SERA analyzed the policies of the seed industry and helped TASTA to articulate its message to the Ministry of Agriculture, Food Security and Cooperatives (MAFC) and identify specific policy changes that would improve the enabling environment for the seed industry.

The SERA Project also played a lead role in the Policy Analysis Group (PAG). The partnership is an informal group of non-state actors working on agricultural policy issues in Tanzania. Initially led by the Food Security Policy Activity, an activity jointly funded by the U.S. Agency for International Development (USAID) and the Bill and Melinda Gates Foundation, PAG enabled SERA to disseminate research findings, and remain informed of research activities of other organizations.

2. Policy Analysis and Research

The Policy Analysis and Research objective covered a wide range of activities, including the project's approach to identify policy and research priorities, monitoring and evaluation, special studies, collaboration, review of grain stocks, and stakeholder engagement.

The SERA Project's long-term policy priorities were informed by the Agricultural Commercial, Legal, and Institutional Reform (AgCLIR) assessment and emerging issues in the New Alliance for Food Security and Agricultural Framework for Tanzania. In addition, the project maintained a flexible work plan and enabled the team to respond to emerging issues and requests from the GOT and other project partners.

Long-term policy priorities, those identified in AgCLIR and project work plans, used an approach that engaged experienced international experts to lead research efforts. The experts were paired with SERA staff and GOT personnel, when available, to provide access to key data and knowledge of local conditions. Research reports were vetted with GOT stakeholders throughout the process and before formal release. An early example of this was SERA's project work on the export ban. Presenting research findings alongside recognized Tanzanian experts strengthened the main messages of the research and led to further requests for support and policy changes.

The flexibility to meet new demands required the SERA Project to develop a rapid approach to emerging policy issues. In 2013, the GOT and other stakeholders requested SERA to provide a rapid analysis of the rice market based on reports of market shortages. SERA Project internal staff

² The Ministry of Agriculture, Food Security and Cooperatives (MAFC) was merged with the Ministry of Livestock and Fisheries Development (MLFD) in 2016 to form the Ministry of Agriculture, Livestock and Fisheries Development (MALF). SERA Project activities completed prior to 2016 will reference the MAFC.

were able to respond quickly using project based data and in-house expertise. SERA Project continued to play this role through the life of the project.

The SERA Project tracked priorities using USAID FtF indicator IR 4.5.1-24, number of policies/regulations/administrative procedures in stages of development. This was tracked quarterly and reported on in detail annually. Starting in 2014, the SERA Project played a lead role in helping to establish the PAG/Partnership Accountability Committee (PAC)³ policy framework and monitoring of policy reforms and implementation.

The SERA Project conducted several special studies, including specific research and analysis at the request of the government. In 2013, USAID Tanzania FtF requested that the SERA Project conduct two special studies: a land compensation and benefit-sharing study for the Ministry of Land, Housing and Human Settlements (MLHHS) Development, and an analysis of a rice irrigation scheme on behalf of USAID Tanzania FtF for the Revolutionary Government of Zanzibar (RGOZ). Both studies were part of larger USAID FtF activities and contributed to the direction and development of non-SERA Project activities.

Collaboration

The design of USAID Tanzania FtF promoted and encouraged collaboration and partnership with other FtF activities. Formal activities included research activities and training. The SERA Project successfully collaborated with fellow FtF projects on two long-term activities: the FtF NAFKA Staples Value Chain Project and the FtF iAGRI USAID

Feed the Future Collaboration

- Policy Research with FtF NAFKA Staple Project
- Food Basket Methodology with USDA ERS
- Policy Seminar Series with iAGRI
- Assessment of Zanzibar FSN program, Mwanza Bora
- Annual Policy Conference
- Policy Analysis Group

Research and Education Project. The NAFKA Project was a critical partner in the research that supported the lifting of the export ban and follow-on research on the National Food Reserve Agency and the Export Permit System. This partnership resulted in key contributions to the SERA Project primary deliverable, the Policy Options for Food Security, Agricultural Growth and Poverty Alleviation in Tanzania (the Policy Options Paper).

The iAGRI Project was a natural partner for the SERA Project. iAGRI is aligned with the Sokoine University of Agriculture (SUA) and was the primary research and capacity-building activity for FtF. SERA and iAGRI jointly sponsored a seminar series at SUA to encourage policy research on issues important to the FtF initiative. In addition, the SERA Project also provided guidance and data to one of the students sponsored under the iAGRI Project for foreign training to complete a master's thesis on rice demand. That student, Edith Lazaro, was later hired as a SERA Project Research Associate and supported a large study of food demand in Tanzania.

³ The PAC is a group of stakeholders that provides oversight on the implementation of New Alliance commitments.

Beginning in 2013, the SERA Project began to work closely with the Food Security Policy activity. The Food Security Policy activity was a USAID activity led by Dr. David Nyange⁴. This collaboration would evolve to include the PAG, the Annual Policy Conferences, trainings, the Market Intelligence Unit (MIU) activity, and the Staples Study (2016).

Inventory of Grain Stocks

This objective also specifically sought to address questions regarding grain stocks and the inventory capacity of the public and private sector. The SERA Project approached this task through a variety of studies. The initial work on the export ban led to an analysis of the National Food Reserve Agency operations and capacity. In addition, the SERA Project supported the Rice Council of Tanzania (RCT) in a rapid assessment of the rice market in 2015, which included an assessment of private-sector inventory capacity. It should be noted that the adoption of the Cereals and Other Produce Act and subsequent establishment of the board of directors led to new government efforts to invest in inventory capacity. SERA Project's research has contributed to the GOT information and recommendations in the Food Security, Agricultural and Poverty Alleviations Policy papers.

3. Capacity Building

The SERA approach to capacity building was to focus on developing the capacity of institutions that were involved in policy reforms, and individuals who were in positions to influence policy reform decisions or involved in implementing reforms.

Individual capacity-building efforts sought to develop research and analytical skills of specific individuals

through workshops or training. For example, when the SERA Project conducted research on the Tanzania Agriculture Business Environment, staff from four government institutions were included in the study team and contributed as well as learned about research. The four team members learned first-hand how the business environment in Tanzania compared to that of Mozambique and Zambia through the study tours to these countries and Tanzania.

Sample Training Activities

- Food Basket Methodology (MALF, MANR)
- Policy Analysis Course (Zanzibar)
- STATA Software Training (GOT/RGOZ)
- Commodity Market Analysis (GOT)
- Strategic Planning (ACT, RCT, ZFSND)
- Field Studies (ACT, RCT, SAGCOT, GOT)
- Policy Seminar Series (SUA)

4. Policy Reforms

From the beginning, the SERA Project sought to engage GOT in research and analysis on those issues that were of mutual importance and interest. The SERA Project actively engaged director-level staff at the MAFC in the development of concept notes and scopes of work and requested the participation of institutional staff. All research and analysis was reviewed and discussed with government stakeholders before final release to address any comment and concern. The SERA Project made several formal presentations for both GOT and larger stakeholder groups when appropriate.

⁴ The USAID Food Security Policy Activity evolved into the ASPIRES Project in 2016.

In a less direct approach, the SERA Project supported public-private sector dialogue on key policy issues. Specifically the SERA Project supported a series of workshops with the seed sector and Ministry of Agriculture, Food Security and Cooperatives (MAFC) to address critical issues facing the sector.

The SERA Project led, as well as participated in, the Policy Working Group organized by the Food and Agriculture Organization (FAO) and the Policy Group organized by the Policy Advisor of the Ministry of Agriculture. SERA took the lead on policy research on the export ban, seed taxes, and the Cereals Board and presented research for group discussion at both forums.

5. Communications and Outreach

The communications and outreach strategy of the SERA Project was to disseminate research and policy analysis through workshops, conference presentations, reports, policy briefs, the SERA website, and local media. Many of the research findings were presented to GOT at closed-door meetings designed to allow open discussion without media coverage or private-sector presence. These meetings were usually followed with workshops that were open to all stakeholders and the media. Talking points and key messages were prepared for media and access to conference speakers was organized. In addition, SERA prepared a series of policy and research briefs that distilled complex issues into main messages and policy guides for policymakers and non-state actors. Finally the website made research and other information available to a wide audience.

B. Tanzanian Operating Environment

Tanzania has multiple stakeholders and actors in the public and private sectors; however, it is the GOT initiatives that have led the direction of agricultural development and the operating environment. Tanzania and various development partners created the Agricultural Sector Development Program in 2003, which established agricultural development targets and funding mechanisms for support. This 10-year strategy, largely supported by the World Bank, was revised in 2015. The Kilimo Kwanza initiative of 2009 helped to establish a clear role for private sector stakeholders in the agricultural sector and gave the private sector a voice in policy issues. This was further supported with the establishment of the CAADP under the African Union New Partnership for Africa's Development (NEPAD). CAADP's growth-oriented agricultural development agenda was aimed at increasing agriculture growth rates to a minimum of six percent per year to create the wealth needed for rural communities and households in Africa to prosper. Subsequently, public and private-sector stakeholders created the Tanzania Agriculture and Food Security Investment Plan (TAFSIP) to support national-level implementation of CAADP objectives. TAFSIP is a sector-wide plan for coordinating and harmonizing the resources needed to accelerate implementation of existing initiatives and to launch new initiatives in the agricultural sector of Tanzania.

1. USAID Feed the Future Program

The USAID FtF initiative is a United States whole-of-government approach that aims to address the root causes of global hunger, improve agricultural productivity, reduce malnutrition, and increase incomes of the poor. The Tanzania USAID FtF initiative began in 2010 and was designed around the goals of the CAADP Compact and the GOT Agricultural Sector Development Program

(ASDP). The framework for the FtF initiative was derived from the TAFSIP and designed to support the development of the GOT investment in Southern Agricultural Growth Corridor of Tanzania (SAGCOT), a public-private partnership initiative to transform the agricultural sector covering the coastal regions of around Dar es Salaam, Morogoro, Rukwa, Iringa, Mbeya, and Ruvuma. The SAGCOT region and Zanzibar were established as the zones of influence for FtF activities.

The USAID Enabling Policy Environment for Agricultural Sector Growth, known as the SERA Policy Project, was one of eight activities under the USAID Tanzania FtF initiative and was designed to aggressively advance policy reform efforts in key areas identified as critical barriers to transformation in the agricultural sector. The SERA Policy Project worked closely with other USAID FtF projects to achieve policy reforms and FtF objectives.

Feed the Future Collaboration

The SERA Project worked closely with the USAID Staple Value Chain Project (NAFAKA) on research that supported the lifting of the grains export ban in 2012. Working with the USAID Department of Food Security (DFS), the SERA Project collaborated with the International Food Policy Research Institute to research the export ban. The U.S. Department of Agriculture (USDA) was a long-term partner supporting the development of an alternative approach to measuring food access for the GOT National Division of Food Security and the RGOZ Food Security and Nutrition Department (FSND). SERA and the iAGRI Project jointly sponsored a seminar series and shared resources. The introduction of the FtF ASPIRES project expanded SERA Project collaboration opportunities and will continue several of SERA Project activities after the SERA Project closes.

2. New Alliance for Agriculture and Nutrition

The 2012 meeting of the Group of Eight (G8) further enhanced commitments of CAADP Member States supporting implementation frameworks. Commitments focused key resources and other contributions on high-priority, high-impact investments within the TAFSIP and in particular on the development of the GOT’s priority area of the Southern Agricultural Growth Corridor. The New Alliance framework relies on shared responsibility, with GOT commitments to ensuring a stable, transparent trade policy, private-sector investment incentives, and increased availability of improved seeds. The SERA Project worked closely with USAID to ensure that the SERA research and policy reform agenda was aligned with the goals of the New Alliance. Specifically SERA Project activities supported the framework policy actions shown in Table 1.

Table 1. New Alliance Objectives

Objective	Framework Policy Action
Increased stability and transparency in trade policy, with reduced tariff and non-tariff barriers.	Implemented policy alternatives to export ban identified in the comprehensive food security study, to strengthen response to food emergencies while minimizing disruptions in the market.
Develop and implement domestic and regional seed and other input policies that encourage greater	Revised Seed Act that aligned plant breeder’s rights with the International Union for the Protection of New Varieties of Plants (UPOV) system.

Objective	Framework Policy Action
private-sector participation in the production, marketing, and trade in seeds and other inputs.	Time required to release new varieties of imported seeds from outside the region to be reviewed and benchmarked with international best practices.
	Qualified private-sector companies authorized to produce foundation seed under proper supervision and testing.
	International Seed Testing Association (ISTA) and Organization for Economic Cooperation and Development (OECD) seed testing accreditations achieved to enable regional and international seed sales.

3. Big Results Now

In 2013, the GOT initiated Big Results Now (BRN), a Malaysian approach to identify, prioritize, and operationalize rapid development in specific sectors. Operationalization of BRN took place in the formation of the President’s Delivery Bureau (PDB). The SERA Project reached out to the Agricultural division to ensure that SERA priorities were aligned with the PDB. In 2014, the SERA Project participated in the business environment lab of BRN. The business environment lab identified critical obstacles to growth in the agricultural business environment, many of which aligned with SERA Project on-going or planned research activities. PDB partnered with the SERA Project on the Agricultural Business Environment Study. Under the new government, the PDB will be reorganized into the existing government Ministries.

4. Project Beneficiaries

The ultimate beneficiaries of the SERA Policy Project were the Tanzanian people. The project worked with government institutions and private sector organizations to improve policies and strengthen their capacity to provide a better enabling environment for the agriculture sector. The primary government institutions that the SERA Project worked with were the MAFC and the follow-on MALF; the Ministry of Agriculture and Natural Resources (MANR) of Zanzibar; the Bank of Tanzania (BoT); and the MLHHS. The primary private-sector organizations that the SERA Project worked with were the Agriculture Council of Tanzania (ACT), TASTA, and the RCT. Other institutions and organizations that the SERA Project supported or collaborated with included the SAGCOT Centre, the PDB for BRN, and the Tanzania Investment Centre (TIC).

C. Management/Implementation

The USAID FtF Tanzania Enabling Policy Environment for Agricultural Sector Growth, the SERA Policy Project, was awarded to Booz Allen and Tanzanian subcontractor Diligent Consulting Ltd, on 7 April 2011. The cost-plus fixed-fee contract ceiling was USD5.6 million with an obligation of \$500,000.⁵ Unlike other activities that focused on the SAGCOT region and Zanzibar, SERA Project’s implementation effort focused on national-level research and analysis, policy reform, and capacity building.

⁵ Contract modification 05 restored the project ceiling to USD8.5m.

D. Personnel

The SERA Project in-country implementation team consisted of four staff and eventually expanded to a total of six. There were two key personnel positions, the Chief of Party (COP) and the Deputy COP. Changes to key personnel are shown in Table 2.

Table 2. Key Personnel Changes

Deputy Chief of Party	Ms. Marialyce Mutchler replaced Ms. Emily Friedberg	7 November 2011
Chief of Party	Ms. Mutchler replaced Dr. Don Mitchell	3 September 2014
Senior Policy Advisor	Dr. Don Mitchell approved as Senior Policy Advisor	4 November 2014

The SERA Project had several staff and organizational changes. In February 2012, the project added the position of Junior Policy Analyst. The purpose of this position was to provide support to the senior policy team in the collection and analysis of data. The position was transitioned to Policy Analyst in 2014 with the additional tasks of database management, leading local research and analysis activities including field trips, and acting as a subject matter expert for key project activities related to food security.

The Communications and Advocacy position was modified in Year 3 to the Communications and Capacity Building Specialist. The personnel change reflected adjustments to the SERA Project's approach to advocacy with regard to non-state actors. Strong working relationships with the GOT on sensitive policy issues provided the SERA Project with the unique opportunity to influence policy changes. Direct advocacy with non-state actors ran counter to this approach.

In Year 4, the SERA Project added the position of Research Associate to address emerging issues related to food consumption patterns. Research conducted under this position had extended SERA Project's reach regarding long-term policy implications of changing consumption patterns.

E. Major Subcontracts

The SERA Project established long-term relationships with a variety of international and national subcontractors. The firms that were added to the SERA Project as subcontractors are shown in Table 3.

Table 3. Subcontractors on the SERA Project

Organizations	Area of Expertise	Approval
Diligent Consulting Ltd	Local and regional short-term technical assistance and long-term staff	November 22, 2011
DPR International	Short-term technical assistance policy research and reform	November 4, 2014

F. Major Contract Modification

The SERA Project received contract modification number 5, which restored the project ceiling to the original USD8.5 million. Upon the contract award, the project ceiling was reduced from USD8.5 million to USD5.5 million, without changes in the project scope of work. Restoration to the original ceiling enabled the SERA Project to meet contract objectives within the contract time frame.

Delays resulting from the national elections in 2015 and subsequent changes in government in early 2016 delayed primary project activity. In April 2016, the SERA Project received contract modification number 8, which provided for a no-cost extension to August 30, 2016.

III. ACHIEVEMENTS

The primary achievement of the SERA Project was to provide rigorous evidence-based analysis and research on important policy issues in the agriculture sector and build capacity to undertake policy analysis, implement policy reforms, and improved systems for monitoring of food security. The SERA Project will leave behind an improved understanding of important policy issues such as food security, trade policy, input policies, and the business environment. A more solid foundation for future policy analysis and research has also been created through research on food demand, market efficiency, and the business environment. Activities started, but not completed, such as making credit more available for smallholders, will be continued by other development partners and will benefit the agricultural sector in the future. The local partner of the SERA Project, Diligent Consulting Ltd, has been strengthened through its association with the SERA Project and has been awarded several projects that it is successfully completing. Data from different Ministries has been organized into a single database and will be transitioned to other USAID-funded projects and development partners.

The SERA Project filled a void in policy analysis and research that local research institutions were not supplying. For example, when the SERA Project began in 2011, it surveyed other research groups to see what research they were doing on the food crops export ban. Many groups reported that they were doing research, but that research never materialized. SERA was able to complete and deliver research on the impacts of the export ban in a timely fashion. The ability to define the problem, prepare a program of research, and execute it in a timely and professional manner became a hallmark of the SERA Project. During the life of the SERA Project, it became a trusted partner of the government and private sector and achieved a reputation for fair and balanced analysis and research. One of the legacies of the SERA Project was to raise the standard for evidence-based policy analysis and research.

Not all policies that SERA provided research and analysis on were reformed, but the process of policy reform takes time and even when policy reforms were not undertaken the process may have still been successful. This was reflected in the seed sector, where policies have not been changed, but substantial progress has been made on achieving accreditation for regional exports, protecting breeder's rights, and making protected government seed varieties available to the private sector. The industry and government are now working together to accomplish these objectives, and the SERA Project played a critical role in providing the forum for discussions and support for the agenda. Another example of how SERA contributed to the process without achieving the final objective was the development of a collateral registry to make lending for moveable assets more secure. The SERA Project was responsible for convincing the BoT to develop a secured transaction law and collateral registry. The activity was not completed during the life of the SERA Project but has been transitioned to the World Bank Group and is now a

priority activity of the BoT. There were also cases where important policies were changed, and one of those was to convince the government to lift the food crops export ban in 2012.

A. Component 1: Research and Policy Reform

One of the primary objectives of the SERA Project was to improve the policy environment for agriculture and the initial focus was directed at the impacts of the food crops export ban on Tanzanian farmers, food prices, and consumers. In addition to that effort, the SERA Project conducted or commissioned research on food security, food import policy, regional export opportunities, export permits, the Cereals Board, local community land rights, collateralized credit, seed policy, and the agriculture business environment. Research was also undertaken to improve the understanding of maize and rice market performance and the demand for food. On Zanzibar, research was conducted on rice import policies and dependence on the world market, and on the potential for increasing rice production through intensification and expansion of rice irrigation. The research findings were disseminated through workshops, research papers, policy briefs, the SERA website, and discussions with policy makers.

1. Export Ban

Tanzania had relied on periodic maize export bans to address food security concerns since the mid-1990s when food grain markets were liberalized. From 2005 to 2011, there were five maize export bans; however, government programs such as Kilimo Kwanza and SAGCOT were focused on expanding food crops production through the commercialization of agriculture and exports were needed to absorb the surpluses. These contradictory objectives of commercializing agriculture and banning exports were a threat to the success of the USAID FtF initiative, and these concerns were heightened in July 2011 when the Minister of Agriculture, Food Security and Cooperatives imposed a maize export ban only a few months after the FtF initiative began. The director of the FtF initiative approached the Permanent Secretary of MAFC to offer assistance to study the impact of the maize export ban on food security and producer incentives. The Permanent Secretary agreed to allow USAID FtF to undertake a study of the impacts of the maize export ban and the responsibility was given to the SERA Policy Project. A concept note was prepared in October 2011 and the proposed research was approved in November 2011. The SERA Policy Project proposed three studies to look at various aspects of the impacts of the export ban. These studies and their objectives were (1) the International Food Policy Research Institute (IFPRI) in Washington, DC, would study the impact on production, poverty, and economic growth using its Computable General Equilibrium Model; (2) the Associates for International Resources and Development (AIRD) would study the regional export opportunities over



Sr. Advisor, Don Mitchell, meeting with maize producers in Arusha.

the next decade; and (3) the Economic Research Service (ERS) of the USDA would examine food consumption patterns and food security. The three teams were brought to Tanzania in March 2012 for two weeks to share their proposed work programs, and undertake a field trip to familiarize themselves with Tanzania and the food security challenges. The three teams undertook their respective studies and a day-long workshop was held in June 2012 to present the results of the studies to the government at a day-long workshop in Dodoma. The workshop was chaired by the Permanent Secretary in the Prime Minister's Office and attended by the Permanent Secretary from the MAFC and the messages were well received. The approach to engage the government was to provide the findings in a closed-door meeting to allow discussion without the press or private-interest groups. Four distinguished Tanzanian experts on agriculture and food security were invited to the workshop and invited to offer comments on the research. A second workshop was held in Dar es Salaam a few days later to present the research to other stakeholders and the press was invited to report on the findings.

The export ban that was imposed in July 2011 expired in December and was not extended. Prime Minister Mizengo Pinda announced in September 2012 that the government would seek alternatives to the food crops export ban and cited studies done under the SERA Project as the reason for the policy reform:

“Generally, studies concluded that **export ban discourages investors, increase Rural and National Poverty, and hurt the poorest Rural Households the most while generally benefiting the wealthiest Urban Households**. On the other hand, these studies revealed that Tanzania has a **unique opportunity to be a major exporter of food crops**, especially maize and rice, to the region because of its abundant natural resources and increasing food deficits in the region. I would like to assure you that the government will make use of the findings of these studies with the view to come up with alternative strategy for eliminating export ban in the near future. Therefore farmers are encouraged to increase production and take advantage of the available market around the region and elsewhere.”

Prime Minister Pinda, Keynote Address during the Seminar on
Accelerating Agricultural Transformation in Tanzania through Multi-
Stakeholder Partnerships. 6 September 2012, Dar es Salaam, Tanzania.

The GOT's response to the SERA Policy Project work on the export ban helped to establish longer-term research and policy objectives, with the culmination of this work presented in the Policy Options for Food Security, Agricultural Growth, and Poverty Reductions for Tanzania. These included development of an improved approach to monitoring food costs (the Food Basket Methodology [FBM]), a study of the role and operating procedures of the National Food Reserve Agency, a study of the Disaster Management System jointly operated by the Prime Minister's Office and the Department of Food Security in the MAFC, detailed econometric studies of the impact of the maize export ban on maize prices in 18 regions, a study of the volatility of food prices and food basket costs, and studies of the cross-border transmission of food demand shocks. These activities are discussed in more detail below.

The government has not used export bans since 2012 and has reaffirmed its commitment to that policy, stressing that farmers are free to seek market opportunities, as stated by the Minister of Agriculture, Food Security and Cooperatives, Eng. Christopher Chiza at a news conference where he was quoted as saying:

“The idea of banning food exports as a way to prevent hunger has proved a failure.”

Minister of Agriculture, Food Security, and Cooperatives,
Eng. Christopher Chiza as quoted in *Daily News*, 2 October 2013,
“Food export ban move a failure, reports Chiza.”

The ban was lifted in 2012 and remained lifted for the balance of the SERA project. This resulted in improved prices to farmers and increased production. The SERA project estimated that the 2011 export ban reduced the value of maize marketed by USD200 million and the impact would probably have been similar in 2013 when prices rose and there was no export ban. The lifting of the ban has provided farmers with improved prices since 2012 and that has increased incomes and allowed greater investments. The impact would have been smaller in years when regional prices were similar to prices in Tanzania even though there was no export ban. If the ban had not been lifted, farm-gate prices of maize and other food crops would have declined more during harvest, and farm incomes, especially of the poorest who must sell at harvest, would have been lower. In sum, there would have also been less investment and lower production of food crops. There is a regional shortage of maize in 2016 and a ban on exports would deprive farmers of higher prices and a loss of revenue approximately the same as in 2011.

2. Cereals and Other Produce Act

The government enacted the Cereals and Other Produce Act in 2009 with the mandate to regulate and operate in all parts of the value chain. As part of the SERA Project work toward establishing policy agenda, the SERA Project reviewed this act. A study was undertaken by the SERA Policy Project in collaboration with the East Africa Grains Council and presented to the Policy Working Group on 11 November 2011. The SERA Project opposed the operation of the Cereals Board and argued that it was a conflict of interest to both regulate and operate in the same markets. However, the government continued with its plan and the Cereals Board is engaged in marketing of maize in direct competition with the private sector.

3. Cereals and Other Produce Regulatory Authority

The Cereals and Other Produce Act established the Cereals and Other Produce Board and Cereals and Other Produce Regulatory Authority with broad powers to purchase, sell, and regulate the cereals and other produce business in Tanzania. The Board is in operation while the Regulatory Authority is yet to be operationalized. The SERA Policy Project did not oppose the operationalization of the Board and viewed it as an appropriate activity for government. However, as noted, the SERA Policy Project opposed commercial operations in direct competition with the private sector under the authority of the Cereals and Other Produce Board.

4. Collateral Registry

One of the most important policy reform efforts of the SERA Project was on credit. Land cannot be used as collateral on loans in Tanzania because all land is owned by the government and most land is not titled and use-rights are informal. Moveable assets, such as equipment, also cannot be used as collateral because the legal framework does not provide secure rights to lenders to recover the asset if a loan is not repaid. This situation is common in many Sub-Saharan African Countries, and a secured transaction law is needed to replace the overlapping and contradictory laws governing individual assets such as vehicles. Such legal reforms would then make it possible to establish a collateral registry to record liens against moveable assets and provide the legal framework for lenders who use moveable assets as collateral.



International expert Dale Furnish discussing rice and rice milling with local growers

The SERA Project began an effort to reform the secured transactions law and establish a collateral registry during the first few months of the project. This followed an effort by a previous USAID-funded project, Biz Commercial, Legal, and Institutional, Reform (CLIR), to do the same but that effort had stalled. Initial efforts to restart the project were not successful and numerous meetings with staff of the Ministry of Finance (MoF) and the BoT were unproductive. A chance meeting between the SERA COP and the Governor of the BoT at a conference finally started efforts to undertake the policy reform and establish a collateral registry. The collateral registry activity was established as a priority in the Financial Inclusion framework in December 2013 and is ongoing, albeit slowly.

As a result of the Financial Inclusion Framework, the establishment of a Tanzanian collateral registry became a priority for the World Bank. In 2014, the SERA Project established a partnership with the World Bank on the activity. The SERA Project provided an international consultant specializing in such legal reforms and a local legal expert who had been involved in the previous effort in Tanzania to support the BoT to undertake the necessary policy reforms and establish the collateral registry. The World Bank committed to supporting the procurement of the assets to create the collateral registry system. Despite every effort by the SERA Project to fast-track the activity, the BoT was slow to advance the project. The presidential election in October 2015 further delayed the activity, and finally in November 2015, the BoT began an accelerated effort to undertake the policy reform and establish the collateral registry. The SERA Project again offered support to the effort and brought the international expert and engaged the local consultant to assist. Unfortunately, little progress was made. The SERA Project is transitioning the project to the World Bank Group, which has included the activity in its work program with the BoT. The SERA Project is confident that the reform will occur and will provide

improved access to credit for smallholder farmers and other small- and medium-scale enterprises (SME).

The failure to complete this activity during the SERA life of project reduces farmers' access to credit which reduces investments and forces many to market their crops at harvest when prices are at seasonal lows. If this activity had been completed in a timely manner, it would have increased productivity and reduced seasonal price variability.

5. Food Security Options

Following the government's commitment to finding alternatives to the export ban to address food security concerns, the SERA Policy Project undertook a number of studies to better understand food security issues in Tanzania and improve programs to monitor and address food security. Food security is a complex issue and the various policy aspects of the challenge were addressed in the Policy Options for Food Security, Agricultural Growth and Poverty Reduction Report in five key areas. These key policy areas were (1) policies to increase food crops production; (2) policies to encourage food crop exports, to raise rural incomes; (3) policies to improve monitoring of food insecure groups and provide emergency assistance; (4) policies for food reserves for emergencies; and (5) policies for emergency food imports.

The recommendations to increase food crops production included following stable policies to reduce uncertainty, improving access to quality inputs and credit, improving the business environment, and making land available for investors. The policy recommendations to encourage food crop exports included reducing trade barriers such as export permits and better monitoring of regional export opportunities. The policy recommendations to improve the monitoring of vulnerable groups included the adoption of the FBM to monitor food prices and food costs, formalizing the MUCHALI (food security and nutrition system) framework, and improving food crop production and stock estimates. The policy recommendations on emergency food grain reserves were to better use existing capacity instead of increasing the storage capability and to focus on core activities. The policy recommendations for emergency food imports were to control illegal imports, establish a transparent rules-based system for emergency food imports, and to observe regional import procedures to avoid trade disputes.

SERA Project received requests for assistance in the advancement of several policy recommendations, while other recommendations continue to be considered by the GoT. The advancement of the FBM continued and was expanded to include training to the MAFC Department of Policy and Planning. SERA project was asked to conduct a feasibility study for the establishment of a Market Intelligence Unit (MIU) as well as to provide training to support the adoption of a transparent rules based emergency import system using analysis of commodity markets.

6. National Food Reserve Agency Operations

SERA Project made specific policy recommendations regarding the operations and mandate of the National Food Reserve Agency (NFRA). These recommendations are:

- NFRA procures 100,000 metric tons (MT) of grain annually to be used for the food assistance program, and distributed according to need, or sold before the next harvest.
- NFRA operates in a transparent and rules-based manner regarding its purchases and sales of grain.
- NFRA expands secure sales outlets as well as external sources of supply.
- NFRA reduces operating costs.



NFRA warehouse.

The Government assists those households that do not produce enough food for their own needs and do not have the income and wealth to purchase food. Most of this assistance is provided in the form of food, primarily maize. Following the research on the export ban in 2012, the SERA Project continued to work with AIRD undertaking research and analysis on the operations of the NFRA. The NFRA is mandated to hold the strategic reserve, but has high operating costs and cost-cutting procedures were recommended (such as reducing remote buying stations). The analysis showed that 100,000 tons of food purchased by NFRA each year at the time of harvest and held seasonally until distributed as food assistance or sold on the market before the next harvest would on average be sufficient for the food assistance program over a normal five-year period. In addition, the current storage capacity of 240,000 tons is adequate to meet the reserves needed.

The NFRA was also advised to focus on operating the strategic reserve rather than engaging in activities to influence market prices because NFRA lacks the resources to significantly influence market prices. Although no action has been taken on SERA Project's specific recommendation, this research catalyzed further research initiated under the MAFC Monitoring African Food and Agricultural Policies (MAFAP) Project. Discussions are continuing within the MALF on how best to use the research.

7. Export Permits

Despite success in convincing the government to lift the export ban, trade policy remained a problem throughout the period of performance of the SERA Project. It illustrates the difficulties of implementing policy reforms and the lack of support within different branches of government for agreed reforms. When the export ban was lifted, the government continued to require export permits. The export permit process was extremely cumbersome, requiring exporters to obtain permits from the Director of the National Food Security Division in Dar es Salaam. SERA research

has shown that export permits do not accurately record exports, are widely circumvented, and their only impact is to increase the cost of exporting and encourage rent seeking by border and other government officials. While monitoring exports is an important function of the Government, it should be done in an efficient way that does not limit exports or burden exporters. However, the Department of Food Security in the MAFC/MALF continues to issue export permits, citing authorities granted under the Cereals and Other Produce Act.

The system was changed in 2014 with authority to issue export permits given to Regional Administrative Secretaries; however, there was limited evidence that the decentralization of the process was implemented consistently. In 2015, the process reverted to the National Food Security Division.

8. Seed Taxes

In Year 1, the SERA team worked closely with MAFC staff and the Executive Director of TASTA and concluded that initial efforts of the SERA Project should be directed at improving the tax treatment of seeds and seed packaging materials. Taxes on seeds have been identified as one of the main constraints for expanded local production and sale of seeds.

Taxes on seeds and seed packaging materials increase the costs of seeds which should be exempt because they are an agricultural input. The current system encourages the importation of seeds already packaged and discourages local packaging, creating a disadvantage to the local seed industry. For example, the dairy sector does not pay taxes on packaging material. If the seed industry could receive the same tax treatment, it would reduce seed costs, improve the quality of seed packaging, and raise crop yields.

The case for zero rating and reducing taxes on seeds and seed packaging materials was prepared by SERA Project in collaboration with TASTA and MAFC in Year 2 and submitted to MAFC for submission to the MoF. However, no policy action was taken. SERA Project continued to work with TASTA and MAFC to strengthen the case for reduced taxes on seed packaging materials and resubmitted the proposal to the MAFC in Year 3. In Years 3 and 4 no policy action was taken; severe budget constraints faced by GOT suggest that improved tax treatment of seeds and seed packaging materials was unlikely. Efforts to improve the tax treatment of the seed industry are facing a challenging budget environment under the new administration. TASTA, Tanzania Horticulture Association (TAHA), and the MAFC have the necessary materials to continue working with the MoF in future governments.

9. Seed Policy

Tanzania has very favorable climatic conditions for a seed industry in the area around Mt. Kilimanjaro and Mt. Meru, which has rich volcanic soils, warm days, and cool nights that are ideal for seed production. A number of world-class seed companies are located in the area, and they export seeds to Europe, but not to neighboring countries because of poor policies, regulations, and institutions that discourage such exports. The SERA Policy Project provided support to the seed industry and MAFC to remove constraints to seed production and exports. These efforts

resulted in improved dialogue and a better working relationship between the seed industry and the MAFC/MALF and to significant progress toward removing constraints to the industry.

Several policy areas were the focus of SERA's work to support reform of Tanzania seed policies, including improving access to public varieties and supporting the accreditation of Tanzania labs and processes to meet ISTA, OECD and UPOV standards. These policy areas were consistent with the objectives of the Tanzanian New Alliance for Agricultural and Nutrition Framework, adopted in 2012. (See Operating Environment section).

The MAFC issued Seed Circular 2011, which established guidelines for private sector access to public sector seed varieties. Among the issues with the Circular was the requirement that seed companies' licensed protected varieties must satisfy market demand. Market demand is not readily known or measured; this increased uncertainty for seed companies and is a barrier to market entry. As a result, private companies were discouraged from licensing protected varieties and prevented seeds developed in public research stations from reaching the farmers.

Tanzania was not certified to export seeds to the region. Three standards are required. ISTA certifies laboratories used in the seed development process. The OECD certification process validates that Tanzania meets appropriate requirements and controls throughout the cropping, seed processing, and labeling operations. UPOV accreditation protects breeder's rights to seeds they develop.

Without these standards, seed companies are reluctant to produce seeds in Tanzania because they cannot export to the regional market and this is potentially the largest market. ISTA and OECD certifications will enable Tanzania to develop a world-class seed industry. Without UPOV accreditation, seed companies cannot protect their rights to seeds they develop and they will not make the investments required to develop new seed varieties because other seed companies could sell seeds without paying royalties.

The initial seed activity of the SERA Project was to sponsor an industry workshop in April 2012 in Arusha to bring the seed industry and MAFC together to discuss industry problems. The workshop was chaired by the Permanent Secretary of the Ministry of Agriculture and included other government officials, such as the Director of Crop Development, and approximately 75 representatives from private seed companies. This day-long workshop led to a better understanding of industry problems and to several SERA activities, including the joint preparation of a petition to the MoF's Committee on Taxation to improve the tax treatment of the seed industry. Other important issues that arose during the workshop were the need for the industry to achieve ISTA and OECD accreditation to export seeds within the region, the need to obtain UPOV accreditation to protect breeder rights, and the need to provide greater access to protected government seed varieties. This helped lead to improved access to public varieties and ISTA, UPOV, and OECD accreditation becoming policy objectives in the New Alliance framework in 2012. A follow-up workshop was conducted in April 2013 and was attended by the Minister of Agriculture, Food Security and Cooperatives to follow up on the efforts to resolve these important policy and regulatory issues. UPOV accreditation was achieved in 2015, OECD

accreditation was achieved in 2016, and application to ISTA has been completed. The testing laboratory is complete and accreditation of the ISTA lab is expected. As a result of SERA Project's support, the public/private sector dialogue process continues to improve the seed policy environment.

There is improvement in the access to protected government seed varieties by the private sector and dialogue continues to address new and emerging issues. Bob Shuma, the Executive Director of Tanzania Seed Traders Association, the private-sector industry association, has presented the SERA Project with a Certificate of Appreciation that states: "The association appreciates your role and support to TASTA and the entire seed industry of Tanzania in 'Building an Enabling Environment for Seed Sector Growth through Policy Reforms'."

10. Land Compensation

All land in Tanzania is owned by the government and the majority of it is under the control of local community leaders. Individuals typically have informal use-rights through their local communities for farming or livestock rearing. Foreign investors can obtain long-term leases, but the process for acquiring such leases is long and uncertain and that has hampered efforts to commercialize agriculture and attract foreign investors. The SERA Project was invited to prepare a study on land compensation schemes and benefit sharing arrangements, to inform government of the advantages of different arrangements, and to document practices being used within the region. This study was contracted to Landesa, which is a U.S.-based non-governmental organization (NGO) specializing in land policies and practices in developing countries. The study was undertaken and completed in 2013. Due to changes in MHHLD stakeholder engagement the workshop planned to disseminate the findings did not take place; however, portions of the study were presented at the Second Annual Conference on Agriculture Policy in Dar es Salaam in February 2015.

The study showed that the land-for-equity approach favored by the Minister was appropriate only in a limited number of situations and other compensation schemes should be considered. Among the implications of the land-for-equity approach is that communities that provided their land to investors might never benefit if the investment was not successful enough to produce profits and that a cash lease was more advantageous in most cases and more commonly used in the region.

11. Improving Performance of Maize and Rice Markets

Improving the performance of food crop markets will provide better price signals to producers and traders, reduce seasonal price variability, and reduce food security concerns. Two studies were undertaken to strengthen the understanding of the performance of food crop markets. The first study, on the Drivers of Maize Prices, was completed in June 2014 and presented at the First Annual Agricultural Policy Conference in Dar es Salaam and the International Conference of Agricultural Economists in Milan, Italy, in August 2015. A policy brief was prepared in November 2014. The paper has also been submitted for publication in the *World Bank Economic Review* Journal and is expected to be published. The second study was on the Cross-Border Transmission of Price Shocks Evidence from Tanzanian Food Markets. A policy brief was prepared and the

paper will be presented at the "Rabat Commodity Conference" in Morocco September 28-29, 2016.

The primary benefit of the research was to quantify the impacts of the maize export ban on Tanzanian maize prices, but the research also provided practical lessons on how markets in Tanzania are linked to regional and global markets. Dar es Salaam is not a major demand or supply hub and Tanzanian grain markets are influenced much more by production and policies in Kenya and Mozambique. The research showed, for example, that Kenya is the dominant external market for maize during the harvest season but Mozambique is the dominant market during the lean season (before harvest). Further, the relatively porous borders with these countries makes it difficult to control exports and imports and such efforts are not likely to be effective. In practical terms, this means that Tanzania cannot isolate itself from regional markets and a better understanding of policies and market conditions in these countries would allow Tanzania to position itself to take advantages of export opportunities. This could inform the newly formed Market Intelligence Unit on which external markets for maize and rice need to be monitored during different seasons. The research also contributed to better understanding of seasonality and showed the potential of improving road transportation to link production in southern Tanzania with the Kenyan and northern markets.

12. Emergency Food Imports

The SERA Project also analyzed food crop imports as part of its work on trade policy. The government does not have a policy on food crop imports, such as rice, and under normal market conditions imports are restricted. Tanzania applies an EAC approved common external tariff (CET) of 75 percent on all rice imports. However, when there is a domestic shortage, the government authorizes the private sector to import and this can disrupt markets and create uncertainty for producers, stockholders, and traders. The SERA Project proposed a transparent rules-based system for emergency food imports as part of its analysis of food security. The response of government was mixed. Little progress was made on the proposal until the government allowed duty-free imports of rice in 2013, in response to rising domestic prices. Imports of 30,000 tons were authorized but actual imports were nearly triple that amount and resulted in a sharp decline in domestic prices.

Emergency food imports are needed when there is a production shortfall and domestic production is not sufficient to meet demand. Such imports have often been done on an ad hoc basis and have disrupted domestic markets, as occurred in 2013. This resulted in a sharp decline in domestic prices and regional trade disputes, as imports were re-exported to neighboring countries. The SERA Policy Project was requested by the USAID Tanzania FtF management, the SAGCOT Centre, and the private sector to investigate. In response, the SERA Policy Project prepared a report documenting events and proposing the development of a rules-based transparent emergency import policy. A proposal was presented to the government in September 2013 at the workshop on food security, and there was strong support for the development of the policy for emergency food imports. Better monitoring of market conditions was recommended to prevent ad hoc imports when not needed and that led to a proposal to

develop an MIU to monitor domestic, regional, and global food markets. A policy paper was prepared and presented to stakeholders in July 2016. The proposed emergency food import policy identified three market situations that can exist between domestic and global rice prices and a market-based response to the two most likely situations was proposed. The third situation requires government action and a rules-based transparent policy response was proposed to respond to such a situation.



SERA Project Team meeting with rice producers.

13. Business Environment for Agriculture

The SAGCOT initiative focused on attracting foreign investors into the agriculture sector to provide an opportunity for smallholders to participate as out-growers. The President of Tanzania led this effort in international forums and attracted great interest but few investors. The BRN initiative examined the business environment for agriculture and identified many problems that contributed to an unfavorable business environment. The SERA Project in collaboration with the MAFC, PDB of BRN, SAGCOT Centre, and the TIC conducted a study comparing the agricultural business environment in Tanzania with that of Mozambique and Zambia. Study tours were conducted in all three countries and income and value-added taxes (VAT), input costs, access to land, and investment incentives were compared. The results showed that Tanzania was not competitive with Mozambique and Zambia in many aspects of the business environment. Zambia had been very successful in attracting foreign investors, and Mozambique had been more successful than Tanzania. The results of that study are being used by TIC to develop a new package of incentives for agricultural investors. The SERA Project presented the findings at the Second Annual Conference of Agricultural Policy in February 2016 and released a policy brief in April 2016. The SERA Policy Project recommended that if Tanzania is to attract large foreign investors to the agricultural sector, it will need to make land more easily available, provide more favorable incentives, reduce corporate and local taxes, and reduce restrictions on occupation of land by majority-owned foreign companies.

14. Food Demand Study

The SERA Policy Project undertook a study of food demand in Tanzania, to understand income growth and price change impacts on food demand. This information can be used to forecast future trends in food demand. The study estimated the demand for 18 food groups by four income groups and found that food demand of lower income groups is very responsive to both income growth and price changes while higher income groups are less responsive. The demand for basic staple foods such as maize is very unresponsive with respect to income while the demand for meat, and other high-value food items is very responsive to increases in income. The implication of these findings is that the demand for maize will grow by little more than population growth rates in the future while the demand for other high-value foods will grow much more rapidly and agricultural investments should be increased for these food items.

15. Gender and Maize Study

The SERA Project, in collaboration with the World Bank, undertook a study of the effects of gender on maize marketing and production in southern Tanzania. The study showed how severely disadvantaged female maize farmers are compared to male maize farmers. They have less land, use less improved inputs, have lower yields and production, and receive lower prices for the maize that is marketed. This results in female maize farmers receiving approximately half as much cash income from maize production as male maize farmers. This contributes to poverty and food insecurity. The study recommended targeted extension services for female maize farmers as an approach to raising yields. This approach has been successful in Uganda and could improve the farming practices and financial management of female maize farmers. A report was jointly prepared with the World Bank and a policy brief was released in July 2016.



Female maize producers are interviewed for the gender study.

16. Zanzibar Rice Policy

The SERA Project completed two policy studies on the rice sector in Zanzibar. The first began in 2012 and examined import dependence, food security, and the behavior of rice importers in Zanzibar. The study showed that 75 percent of the rice consumed on Zanzibar was imported and imports were concentrated among only five large companies. These companies had the market power to control prices and prevent the entrance of new companies. The tariff being charged on imports was not being correctly calculated and import receipts were less than authorized. The SERA Project also reviewed plans by RGOZ to establish a strategic rice reserve and advised against such a reserve because of the cost of maintenance. Instead, SERA recommended a financial reserve to be funded by increased tariff revenues. The results of this study were presented to the government in a workshop in September 2013.

17. Zanzibar Irrigation

The second study was on the feasibility of expanding irrigated rice production on Zanzibar. The SERA Project computed the economic returns to expanding irrigation and compared those with the cost of increased intensification of irrigated and upland rice using the Strategic Rice Intensification (SRI) approach developed at Cornell University in the United States. The results showed that it was much more economically viable to intensify production on existing irrigated and upland rice areas than to invest in new irrigation. Further, the objectives of RGOZ of reducing import dependence to 50 percent could be achieved using this approach. A report was completed in July 2014 and a workshop was presented to the MANR in December 2014.

18. Market Intelligence Unit

The SERA Policy Project proposed the creation of an MIU at the workshop hosted by the Prime Minister's Office on Policy Options for Food Security, Agricultural Growth, and Poverty Reduction

in Tanzania on 27 February 2015. The purpose of the proposed MIU would be to monitor domestic and international markets of key agricultural commodities to support policy decisions. An MIU could improve the performance of Tanzanian food markets by informing traders and farmers of the current market situation and future prospects, support a Transparent Rules-Based Emergency Food Import System, and act as a catalyst for improving data systems as market intelligence becomes integrated into policy decision making.

This proposal was widely supported and followed with a request from the MAFC to support a feasibility study for the establishment of an MIU within MAFC with staff participation from the MAFC and Ministry of Industry and Trade (MIT). The SERA Project supported a feasibility study led by Diligent Consulting Ltd to determine how and where such a unit might operate and be located. Training was provided on Commodity Market Analysis and a Transparent Rules-Based Emergency Import System to staff of the MALF and MIT by SERA staff and consultants in July 2016. The final report on the feasibility and establishment of an MIU was presented to the Management Team of the MAFC in August 2016.

The study presents a proposal for the establishment of an agricultural Market Intelligence system, initially starting as a Unit (MIU) under the Ministry of Agriculture, Livestock and Fisheries (MALF), and later on graduating to a semi-autonomous agency. The MIU would address challenges of the current market information system by providing more comprehensive and holistic information for decision making by producers, domestic traders, aggregators, processors, exporters and the government. The FtF ASPIRES project will continue to support this activity.

19. Staple Study

The Staples Study assessment was a collaborative activity with the FtF ASPIRES project and had two objectives: complete staples food market assessment for the current harvest to create a countrywide food markets outlook, and use the assessment methodology and report preparation process as a template for the first quarterly bulletin for the MIU. The team included members from the MIT and the MALF for institutional knowledge and capacity building purposes. The approach and methodology included a review and synthesis of recent reports on food markets in the region including studies by Famine Early Warning Systems Network (FEWSNET), Regional Agricultural Trade Intelligence Network (RATIN), and World Food Programme (WFP) and an analysis of food market price data to understand trends in food prices. The second stage was a rapid survey of strategic staple food markets in major urban centers (e.g. Dar es Salaam, Arusha, and Mwanza), production areas (e.g. Kibaigwa, Makambako, Songea and Sumbawanga), and border markets (e.g. Namanga, Horohoro, and Tunduma). The assessment also surveyed large food traders and reported on public stockholdings (i.e. NFRA, WFP) to determine the adequacy of current stocks. The final report summarized key areas of risk and opportunity and made specific recommendations for policy makers. The bulletin will be presented to the MALF for discussion and reviewed by the ASPIRES project.

B. Component 2: Institutional and Individual Capacity Building

The SERA Project's approach to capacity building is twofold. The first approach focuses on institutional capacity-building activities for selected organizations that can provide the greatest

support to the development of an enabling policy environment. The second addresses increasing capacity for research and evidenced-based policy analysis of individuals through training and support for research and policy analysis. The SERA Project focuses primarily on public-sector institutions and individual capacity building to support the implementation of policy reforms. The majority of activities focus on GOT and RGOZ agriculture line Ministries and institutions. The SERA Project also supported individual capacity-building efforts in dedicated workshops and through individual participation on reach activities, field studies, and observational activities.

1. Institutional Capacity Building

The SERA Project focused on institutional capacity-building activities of selected organizations that are critical to the success of reforms of the policy and regulatory environment for agriculture growth. Specific public-sector institutions emerged as a result of research and policy analysis. Institutional capacity building for the public sector focused on the development and implementation of systems that improved the research and analytical capacity for policymakers. Key recipients were the MAFC/MALF NFSD and Department of Policy and Planning, Plant Breeders Rights' Registrar, and the Revolutionary Government of Zanzibar, Ministry of Agriculture and Natural Resources Food Security and Nutrition Department, [RGOZ, MANR, and FSND].

To identify private-sector institutions, SERA conducted a rapid institutional assessment and selected those institutions that express commitment and the greatest opportunity for impact. Activities with private-sector organizations were strategic and supported an organization's ability to identify research and analyze policy issues critical to their membership. Three private sector organizations received strategic support from SERA: ACT, TASTA, and RCT.

a. Ministry of Agriculture National Food Security Department

i. Food Basket Methodology

The SERA Project worked closely with USDA ERS to provide the GOT with alternatives to the use of export bans for food security. After the 2012 presentation of research and subsequent lifting of the export ban, the GOT requested that SERA and USDA ERS develop a methodology to estimate the cost of a typical food basket to measure food access.

The current early warning system relies on the use of forecast data collected at the district level, and aggregated at the sub-national level. The system requires the submission of monthly data by district agricultural officers forecasting crop harvests. The food security department conducts two forecast validation trips a year before finalizing data. This information is then converted to maize equivalent to determine potential production and identify possible production shortages.

The MUCHALI rapid assessment is the second stage of the early warning system. It uses a collaborative approach drawing on resources and information for other GOT institutions as well and non-state actors such as WFP and FAO. Rapid assessments are conducted in districts that have been pre-identified through the preliminary forecast method. The results of the MUCHALI

are presented to Permanent Secretaries of the Tanzania Disaster Relief Executive Committee (TANDREC)⁶ to determine immediate needs and further support.

The creation and adoption of a food security assessment based on access is a new tool for the GOT to utilize in the food security early warning systems. The FBM is designed to monitor changes in food costs and can be used as an indicator of access. In addition, the FBM has the potential to be modified to include nutritional information.

FBM measured changes in access to food through the calculation of the monthly cost of a representative food basket. Access is defined as the ratio of the total cost of the food basket to income. The methodology measured the impact of a price shock for a specific commodity, such as maize, on the total cost of the food basket, as prices are weighted by the commodity's share in consumption. The analysis required monthly retail prices of the foods in the basket broken out at a regional level. These prices are collected by the National Bureau of Statistics (NBS) and the MIT.

The broader measure of food costs is computed from the retail prices of the 17 largest food items in the typical food basket, and is significantly less variable than the prices of key food items typically monitored. For example, the cost of the typical food basket in Morogoro region rose 19 per cent from January 2011 to December 2011, while the retail price of rice rose 34 percent. Conversely, the cost of a typical food basket fell 6 percent from January to December of 2013 while rice prices fell 15 per cent. The Food Basket Methodology has the advantages of being timely, objective, and quantitative which facilitates comparison of food costs over time and between regions.

ERS results of the feasibility study were presented to stakeholders and the GOT at the Food Security workshops on 11 and 13 September 2013, respectively. In addition, the SERA Project developed training of trainers materials at the request of the Director of the NFSD so that staff members would be empowered to train other stakeholders at the national and subnational level.

The SERA Project has worked closely with the USDA ERS over the last four years supporting the development, training, and implementation of an FBM in the early warning unit and MUCHALI systems of the National Department of Food Security. The FBM system is applicable to both sections of the national food security system. The SERA Project began providing direct support to the early warning unit in 2013, with the development of an FBM feasibility study and began supporting the MUCHALI system in 2014 with an assessment of early warning data.

The SERA Project and ERS supported 12 official training sessions, several ad hoc workshops, and field studies in the development, training, and testing of a workable model for measuring access

⁶ TANDREC is chaired by the PMO-PS and members are from various Ministries related to disaster management including, but not limited to the MALF, Ministry of Health and Social Welfare, Ministry of Water and Irrigation, and Ministry of Community Development, Gender and Children.

to food that can support and supplement current early warning methodologies using existing and available data.

The food basket activity has faced several challenges. The FBM requires accurate measurable data. Currently the most complete data set available is aggregated at the regional level. The DFS, ERS, and SERA worked throughout 2014 and 2015 to identify alternative sources of data and data at the district level that would enable FBM users a less macro analysis of food access. Alternative sources of data include the Household Budget Survey (HHS) and Household Economy Approach (HEA), which provides income and expenditure data by livelihood zone.



Food Basket Methodology training session

The successful development and adoption of a FBM could impact the reliance on the current preliminary forecast methodology, which is costly, time consuming, and represents only one variable of food security, availability.⁷ The FBM can be used on a monthly basis throughout the year to monitor access, where the current system relies on annual forecasts of production. In addition, the current system converts and measures food security in terms of maize only. The FBM measures a range of foods based on consumption, and could allow for measuring utilization. Finally, long-term analysis can be used to analyse trends and stability.

The USDA ERS will continue to provide support to the GOT on this activity.

b. Ministry of Agriculture Department of Policy and Planning

i. Food Basket Methodology

The SERA Project worked in collaboration with the Platform for Agricultural Policy Analysis and Coordination (PAPAC) in the Department of Policy and Planning to provide training and capacity building for the development and application of the FBM in order to inform policy decisions and long-term planning. Training participants were selected from previous PAPAC training activities to build on their existing skill sets. The training was anchored in the application of the FBM for policy analysis completed in the SERA policy brief on food basket costs in Tanzania. It is anticipated that PAPAC will use the training for market analysis activities.

ii. Transparent Rules-Based Import/Export System (Commodity Markets Training)

The transparent rules-based training was a critical activity supporting the establishment of an MIU. The objective of the training was to teach participants how to analyze commodity markets to inform government about the food crops situation in Tanzania, and the regional and global

⁷ Four elements of food security are availability, access, utilization, and stability.

markets. Training focused on analyzing grains (maize, rice, and wheat), oilseeds, and sugar. Further, the training included basic economic principles; statistics; sources of data and information; global food markets; regional and national markets; skills training in Microsoft Word, Excel, and PowerPoint; and preparation of a report and PowerPoint presentation for management. The training was provided to 12 students from the MALF and led by Dr. Mitchell, Ms. Lazaro, and Varun Kshirsagar—an independent consultant.

c. Ministry of Agriculture and Natural Resource Management, Department of Food Security and Nutrition Zanzibar (FSND)

The FSND was established in November 2011 as part of the Food Security and Nutrition (FSN) Act of 2011. The department has three core functions: coordination, capacity enhancement, and monitoring and evaluation of the food security and nutrition situation in Zanzibar. The FSND is housed within the MANR and has received support from the FAO, WFP, and United Nations Development Programme (UNDP) under the Zanzibar FSN Program.

The FSND Capacity-Building Action Plan (CBAP) had three objectives: (1) improve organizational systems and internal management structures to respond to internal and external needs, (2) improve methodologies and approaches for early warning systems to identify food insecure regions and plan and deliver food assistance, and (3) improve capacity to identify and prioritize policy issues, and conduct policy analysis and research.

i. Strategic Planning and Monitoring and Evaluation Systems

The first activity supporting the Zanzibar FSND CBAP was to conduct a mid-term assessment of the Zanzibar FSN Program (2008). The assessment was the first in a series of activities designed to improve organizational systems and internal management structures to respond to internal and external needs. The assessment included a review of FSND documents, map of FSND program activities to lead stakeholders, review of secondary research and identification of key stakeholders for interviews, and a draft of the report. The assessment identified major constraints in program implementation, reviewed components, and provided recommendations for Phase Two of the Zanzibar FSN Program in the format of a strategic plan.

The first major constraint to implementation was the time-lapse of 2 years and 11 months between the adoption of the FSN Policy and Program and the necessary legislation providing for implementation by the FSN Act. The program required a high level of interagency collaboration on activity design, implementation, and monitoring. Without this collaboration, implementation was fragmented and difficult to assess. This impacted interagency collaboration and the availability of human and financial resources.

The SERA Project conducted a workshop for 16 members and presented the results of *Phase One—Review of the Zanzibar FSN Program*, and engaged participants in a stakeholder mapping exercise, reviewed relevant legislation, and identified key priorities for Phase Two. Participants received skills development in strategic planning and organizational prioritization. Follow-up activities and primary stakeholders were identified. The SERA Project will continue to provide primary support specifically with the assessment of FSND-Tanzanian Social Action Fund (TASAF)

activities and the drafting of a Strategic Organizational Plan. Subsequent training and workshops were held to develop an FSND Performance Monitoring Plan.

ii. Food Basket Methodology

In Year 4, the SERA Project and the USDA ERS began working with the FSND to support the application of the FBM in the Zanzibar Food Security early warning system. The FSND began to use the FBM in quarterly presentations of early warning information to the FSN Committee. At the end of Year 4, USDA ERS and the FSND began the development of a healthy/nutritious food basket. USDA ERS will continue to work with the FSND on the implementation of a healthy/nutritious food basket.

d. TASTA

The SERA Project worked closely with TASTA to support public-private sector dialogue on constraints to private-sector investment and growth and other critical issues affecting the seed sector. In total, the SERA Project supported eight stakeholder workshops on issues covering taxes on seed and seed packaging, access to public varieties, and international accreditation processes. Working closely with the MAFC Department of Crop Development and TASTA, the SERA Project provided support for open dialogue, which had a direct impact on policy affecting the sector. Details regarding policy issues are in Section III, Component One: Research and Policy Reform.

e. Agricultural Council of Tanzania

The Agricultural Council of Tanzania (ACT) was identified as a key partner in the technical proposal and included a letter of commitment for collaboration and support. ACT is a national apex organization and non-state actor dedicated to improving the policy and regulatory environment for agricultural growth in Tanzania. ACT was established in 2003 and is a key leader and voice for the private sector in the creation of Kilimo Kwanza. Members and stakeholders include farmer associations (crops, livestock, and fish producers), suppliers, processors, transporters, researchers, and other agribusiness stakeholders.

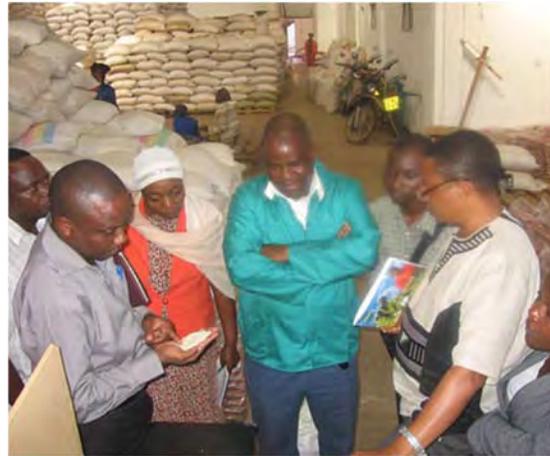
A rapid institutional assessment of ACT identified three objectives for the organizational CBAP: (1) improve ACT's capacity to identify and prioritize policy issues and conduct policy analysis and research, (2) increase organizational capacity, and (3) strengthen advocacy with the GOT. To direct ACT's future, the SERA Project supported the design and development of the second Organizational Strategic Plan. This process included a study tour for ACT board members, an environmental assessment, strategic planning process, and the drafting of the second Strategic Plan.

i. Study Tour

A delegation of 11 representatives from ACT, consisting of three association members, four board members, and four secretariat employees participated in the study tour and were also ACT strategic planning committee members. Nine participants attended meetings with Zambia National Farmers Union management, member organizations, and farmer clubs and eight participants met with National Association of Small Farmers (NASFAM) operations, members' organizations, and other stakeholders. In addition, participants in Malawi also attended a one-

day Agricultural Policy Seminar sponsored by the Farmers Union of Malawi (FUM). Four participants travelled to both Zambia and Malawi. The information learned during the meetings and interviews provided key inputs into the strategic planning process. The main findings of the study tour were:

- Democratic systems, transparency, and set terms for leadership are key pillars in the organization structure and operations.
- The non-political nature of an organization and its members are critical to an organization's legitimacy, and because of that, individual members, staff, and organizations are prohibited from running for political office.
- Services must provide tangible benefit for members and be paid for by members.



ACT Study Tour in Malawi.

ii. Strategic Planning

Direct support for the evaluation of ACT's first Strategic Plan and the creation of the second Strategic Plan followed the study tour with an environmental scan and analysis and a detailed stakeholder analysis. To develop the external environmental scan, the SERA team conducted open-source research and gathered relevant documentation to analyze and present an understanding of the social, political, and economic factors that may impact ACT as an organization. The SERA team conducted a stakeholder's analysis to develop an understanding of the operating environment. The SERA team worked with ACT to build a representative list of 20 interviewees (15 external, 5 internal) that formed a cross-section of board members, ACT members, and ACT Secretariat staff located in both Dar es Salaam and Arusha. In these interviews, a series of questions were asked about their perspective on ACT's successes, strengths, weaknesses, opportunities, and challenges. This information was presented at the first ACT Strategic Planning workshop in the first quarter of Year 2. The Draft Strategic Plan was reviewed and adopted by the board of directors in the second quarter and presented at the Annual General Meeting of the ACT membership on 12 January 2013.

f. Rice Council of Tanzania

The SERA Project began working with the RCT in Year 4 supporting two separate activities: Organizational Strategic Plan and a rapid assessment of the rice sector. Later activities included strategic support for communications and personnel support for a policy analyst.

i. Strategic Plan Development

The SERA Project received a formal request for support from RCT in Year 4 for organizational development and strategic planning. The SERA Project provided technical assistance and advice on the strategic planning process, supported the creation of the RCT Strategic Planning Committee, required RCT participants to self-fund a portion of the activity, and identified and

hired a planning facilitator. An interactive strategic planning session was conducted 10–12 March 2015 at the Ocean View Resort in Bagamoyo. Twenty-one participants attended, representing members of the RCT as well as other critical stakeholders, including small shareholder farmers, small and medium traders, large outgrowers, input suppliers, and research and financial institutions. The Final Strategic Plan was presented to the RCT Board of Directors on 26 May 2015 and an internal work plan for implementation was completed.

ii. Rapid Rice Sector Assessment

In 2013, GOT allowed duty-free rice imports from Asia without following the East African Community procedures. This action disrupted the market and led to trade disputes in the region. The private sector did not anticipate the allowance of duty-free imports and has concluded that better organization and communications with the GOT is needed.

In 2014, Tanzania recorded a surplus of grains production. It was reported that public (NFRA) and private warehouses were filled to capacity. With no place to store the grains, harvested stocks were stored on the ground in some regions. In addition, there was conflicting and unreliable data on quantity and location of stocks and the varieties of rice available in the market.

The SERA Project supported RCT in a rapid assessment of the rice sector. The objective of the study was to understand the rice stocks held by the private sector in Tanzania and to use this information to improve policy dialogue with the MAFC. This information was identified as a major gap in understanding the current market and impact of the East African Community common external tariff (CET) policy. The rapid assessment provided a snapshot of the location and quantities available from Mbeya, Morogoro, and Shinyanga regions and included market research in Morogoro, Mwanza, Arusha, and Kilimanjaro.

The rapid assessment team included members from the Ministry of Industry and Trade (MIT), with field research being led by the RCT Executive Director. The assessment was completed in two phases. Phase One of the field study was completed in Morogoro, Iringa, and Mbeya. The second phase of the field study investigated Shinyanga, Mwanza, Arusha, and Kilimanjaro.

The RCT held a stakeholders' discussion on 22 June 2015 and released their position paper entitled *Tanzania's Rice Industry is Under Threat*. Findings from the Rapid Assessment of the Rice Sector were presented as part of this report. The event was attended by 75 participants and 35 media houses.

iii. Policy Analysis Support

The RCT Strategic Plan included personnel and staffing recommendations. RCT requested SERA Project support assistance for the recruitment and financial support of a Policy Analyst position. The SERA Project assisted in the recruitment and provided financial support for nine months for this position. During this time, RCT identified alternative financial resources.

2. Individual Capacity Building

The SERA Project used several strategies to increase capacity for research and evidenced-based policy analysis for individuals. In addition to traditional training and workshop activities, SERA sought to strengthen the capacity of individuals in public and private-sector stakeholders through their active participation in research activities, field studies, and observational activities.



Meeting with rice producers during the Rice Sector Assessment in 2015

a. Policy Seminar Series

The SERA Project and iAGRI jointly sponsored a Policy Seminar Series for faculty and graduate students at SUA to encourage interest in policy research. The SERA Project prepared a concept note in February 2012 and shared it with the Chairman of the Department of Agricultural Economics at SUA and the COP of the iAGRI Project. The first call for research proposals was issued in August 2012, and 11 proposals were received of which four were selected for financial support following acceptable revisions. The four selected research proposals were approved and initial funding provided. The research topics were:

1. Institutional Analysis of Agricultural Input Service Delivery in Tanzania. The case of National Agricultural Input Voucher System
2. Maize Market Liberalization and Commercialization of Maize Production in Rukwa Region, Tanzania
3. Policy Imperatives of Market Failure Control in the Cashew Nut Industry Value Chain
4. Is the 1000 Days Focus Policy Option for Improving Child Nutrition Sufficient for Preventing Low Birth Weights Among Poor Communities?

Papers were presented in Year 2 and finalized in Year 3. However, the teams were slow to deliver their research papers and the quality of the papers indicated more support was required. Consequently, the format of the Policy Seminar was changed and the second Policy Seminar Series began in Year 4 based on the experiences and lessons learned from the Series I. A more structured and targeted approach was taken in Series II, with a topical research focused on land. This collaboration included Michigan State University (MSU). This activity remains open with leadership and support from iAGRI and MSU.

b. Policy Analysis Training Zanzibar

The SERA Project's support to individual capacity building included the teaching of a policy analysis course in Zanzibar. The policy analysis course was taught by the SERA COP and Junior Policy Analyst to 20 students enrolled from various government Ministries in Zanzibar. The course consisted of 3 hours of lecture and skills training per week for 8 weeks and focused on analyzing policies to inform decision makers and improve policies. Topics covered in the course included problem identification, characteristics of good policies, the impact of vested interests, policy

analysis, the importance and source of data, data analysis and results presentation, and policy change advocacy. Teams prepared a concept note, policy paper, and PowerPoint presentation of their policy analysis. The final class required each team to present its analysis to its invited supervisors and was followed by a graduation ceremony and awarding of certificates of completion. Seventeen students completed the course, with two dropping out and one advancing to another position.

c. Internal Staff Development

The SERA Project sought to increase individual capacity and worked with the FtF iAGRI Project to identify current and recent graduates at SUA that fit the personnel needs of the SERA Project. In Year 1, SERA identified and hired a master's of science (MS)-level student from SUA to join the SERA team as a junior Policy Analyst and finish her thesis.

Ms. Aneth Kayombo was employed as a Junior Policy Analyst in February 2012 and promoted to Policy Analyst in April 2014 upon completion of her MS degree at SUA. She gained important work experience and skills in policy analysis, food basket methodology, and management of research data, working directly under the supervision of SERA Project senior policy advisors. Specific tasks that developed Ms. Kayombo's skills included the development of the SERA Project database and data analysis for long-term research activities and rapid response activities. Among her contributions to the project were providing skills training to students as part of the 8-week course on policy analysis taught in Zanzibar, assisting with trade policy research on the export ban and food imports, and contributing to the analysis and capacity building on the FBM.

In Year 3, the SERA Project began to provide informal support to Ms. Lazaro, who was completing her MS degree in agriculture economics at The Ohio State University through the iAGRI project. Ms. Lazaro's research on rice demand for her MS thesis fit with policy issues that had emerged in the SERA work plan. On completion of her MS, the SERA Project hired Ms. Lazaro as a Research Associate. This provided her the opportunity to extend her work to the econometric estimation of a food demand system for Tanzania, using household budget data of more than 10,000 households. This research was an important contribution to the work program of the SERA Project and a way to allow her to continue her professional development. She is currently in discussions with two American universities to enter a Ph.D. program.

d. Skill Training

The SERA Project offered two skills development training courses in Year 5: Stata Statistical Software Training and Website Development and Management Training.

i. Stata Statistical Software Training

The SERA Project collaborated with the USAID ASPIRES project to deliver two five-day training sessions on Stata database management. Stata is one of the leading statistical software packages used by policy analysts. It was selected as the preferred software package because of ease of access and one-time purchase fee. An MSU professor, with assistance from two trainers from local research and training institutions, IFM and REPOA, conducted the first week of training.

Instructors from IFM and REPOA led the second training. A total of 42 individuals from the GoT and the RGOZ were trained.

ii. Website Training

The SERA Project provided strategic communications support to private-sector beneficiaries, PAPAC, and the Zanzibar FSND. This work identified a need for website development and management training. SERA organized a training to provide basic skills to the staff on website content management to be able to upload department documents in a timely manner. The objective of the training was to improve the capacity of participants and their organization to improve website content. Participants from Zanzibar FSND, RCT, PAPAC and Tanzania Seed Trade Association (TASTA) received one-week training and at the end were able to create and improve upon existing organizational websites.

e. Individual Participation in Research and Studies

SERA Project's research activities sought to engage representatives from government institutions in field research and report drafting. This ensured that the research would build on existing GOT knowledge and institutional systems, help to solidify the USAID FtF partnership with the GOT, and provide capacity building to individuals working directly with or supporting policymakers. The SERA Project worked with 11 individuals on studies including the export ban field research, the assessment of early warning data systems, the agricultural business environment study, and the staples food crops study.

f. Gender

The SERA Project's work in gender is in three areas: individual capacity development, training, and research. In Year 1, the SERA Project developed the Gender Work Plan. This plan established targets related to SERA Project research and policy reform agenda and capacity-building programs. Targets for gender inclusion were aligned with the Project Performance and Management Plan.

C. Component 3: Communications and Advocacy

The SERA Project provided communications and advocacy support to public and private-sector institutions. The early success of policy research work on the export ban led to strong working relationships with the GoT. Close collaboration with the GoT limited our ability to provide direct advocacy support to non-state actors because of concern that it could weaken our relationship with the GoT. The approach to Advocacy and Communications was revised to provide information and disseminate research findings rather than to publicly advocate for policy reform. This was consistent with the approach to policy reform that focused on government counterparts rather than grassroots organizations. The SERA Project focused on communication activities that supported the policy research agenda and targeted public-sector institutions. Support to private-sector organizations focused on institutional capacity building and providing assistance on strategic policy issues. The primary communication tools were the project website, the development and distribution of policy briefs, and workshops and conferences.

1. Website

The SERA Project website was a required activity. The launch of office FtF Communication Guidelines delayed SERA Project efforts. The SERA Project worked closely with the USAID Tanzania Communications Office to prepare the necessary justifications and ensure that the project website met new requirements.

In Year 2, the SERA Project was able to start on content design and site development with a local service provider. At the end of Year 2, the SERA Project received the necessary approvals to move forward with the launch of the project website. During this process, the SERA Project Communications and Capacity Building Officer received extensive training on content management and day-to-day administration. The website was the main communications tool for SERA, making available evidence-based research and other key policy reform information. The SERA website was launched in 2014 and had more than 4,200 visits through the second quarter of 2016.

2. Policy Briefs

Policy briefs were prepared on many of our research efforts and widely disseminated. The importance of the briefs is in their summation of key findings of evidence-based research and policy analysis. Policy briefs aligned with SERA Project key activities and recommendations from the Policy Options paper. The first policy brief was prepared on the impacts of the export ban in August 2012 following our workshops. It summarized the findings from all of the research into an eight-page policy brief, and 1,000 copies were prepared and disseminated. The second policy brief was published in November 2014 and presented at the First Annual Conference of Agricultural Policy in Dar es Salaam on the Drivers of Maize Prices. In total eight policy briefs and two policy research briefs were completed during the SERA Project.



Alex Mkindi, Senior Agricultural Policy Advisor
Press Interview at the 2013 Food Security
Workshop

3. Workshops

The presentation of evidence-based research and policy recommendations took place in a series of public and private workshops. This strategy was critical to SERA Project's success working with the GoT and RGoZ. In addition to intense collaboration with government counterparts, research findings and recommendations were presented in private sessions of GoT stakeholders, hosted by GoT leadership, for internal discussions, before public presentation and debate. The workshops enabled the free discussion of ideas among government stakeholders and resulted in improved understanding and knowledge of the research presented.

The first SERA workshop on the impacts of the food crops export ban was presented to high-ranking

government officials in Dodoma in June 2012. The workshop was chaired by the Permanent Secretary (PS) from the Prime Minister's Office and attended by the PS of the MAFC and 30 high-ranking government officials. Researchers from AIRD, IFPRI, USDA, and World Bank presented research on the effects of the export ban in a day-long workshop. That was followed two days later by a workshop for the public in Dar es Salaam, with presentations by the same researchers to approximately 90 participants and the media. This approach of holding a closed-door workshop for GOT and a second workshop for all stakeholders and media was repeated in September 2013 when a workshop on food security was presented. Then a third workshop was presented to government officials in Zanzibar by the same researchers. This approach of presenting workshops to different groups was effective at getting maximum exposure for the research and being able to focus the presentations on the particular group being addressed. SERA research was also presented to key stakeholders at smaller half-day workshops for 20 or 30 participants to present and discuss a single research report.

4. Conferences

The SERA Project as a key partner and member in the PAG played an important role in the Annual Agricultural Policy Conferences in 2014 and 2016. The first conference was held in November 2014 and SERA provided resources, helped to organize the conference, and presented two research reports at the two-day conference, which was attended by nearly 100 participants. The second annual conference was held in February 2016 (delayed from December 2015), and SERA made four presentations and chaired one session. The Annual Agricultural Policy Conference will continue after SERA ends and will be part of the legacy of SERA because it was patterned after the two workshops presented by SERA in June 2012 and September 2013, and SERA was actively involved in organizing, participating, and providing financial support to the two conferences.

5. Success Stories

SERA project completed and submitted seven success stories covering research, policy reform, organizational development and individual capacity building. Success stories submitted:

- Maize Export Ban submitted in 2012
- Zanzibar Food Basket Methodology for Food Security Early Warning
- The Early Success of the Rice Council of Tanzania
- National Agricultural Policy Forums, the Annual Agricultural Conference
- Individual Capacity Building - Aneth Kayombo submitted in 2015
- Improved Food Security Systems: Using a Food Basket Approach to Measuring Access in the Tanzanian Mainland.

IV. COMPLIANCE WITH THE INDICATORS

A. PERFORMANCE MANAGEMENT PLAN

Table 1. USAID Standard and Required if Applicable Indicator Actuals for Life of Contract

Indicator		Baseline	Year 0.5 Apr 2011 – Sep 2011	Year 1 Oct 2011 – Sep 2012	Year 2 Oct 2012 – Sep 2013	Year 3 Oct 2013 – Sep 2014	Year 4 Oct 2014 – Sep 2015	Year 5 Oct 2015 – Aug 2016 ⁸	LIFE OF CONTRACT TARGET	LIFE OF CONTRACT ACTUALS
IR. 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity or food security training. (RiA) (WOG). ⁹	New	0	NA	25	72	10	70	NA	437	502
	Cont.					55	30	NA		
	Male					39	180	63		
	Female					26	61	36		
IR 4.5.2-36 Value of exports of targeted agricultural commodities as a result of USG assistance. (S). ¹⁰	Maize	\$20,820,000	0	0	96,520,000	37,660,000	54,800,000	NA	\$56,749,200	\$188,980,000
	Rice	\$37,050,000	0	0	0	0	0	0	0	
IR 4.5.2-30 Number of MSMEs, including farmers, receiving USG assistance to access loans (S)	Medium	NA	0	0	0	0			2,400	0
	Small		0	0	0	0			350	0
	Micro		0	0	0	0			250	0
IR 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following processes/steps of	NA									

⁸ Changed to meet revised contract end date, Contract Modification 8.

⁹ Years 1 and 2 reported as custom indicator 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity or food security training, no disaggregation.

¹⁰ Data source for Y2 and 3 WITS, 2014, not verified. Data not available for 2016.

Indicator	Baseline	Year 0.5 Apr 2011 – Sep 2011	Year 1 Oct 2011 – Sep 2012	Year 2 Oct 2012 – Sep 2013	Year 3 Oct 2013 – Sep 2014	Year 4 Oct 2014 – Sep 2015	Year 5 Oct 2015 – Aug 2016 ⁸	LIFE OF CONTRACT TARGET	LIFE OF CONTRACT ACTUALS
development as a result of USG assistance in each case (S): ¹¹									
• Stage 1: Analysis	NA	0	7	4	1	0	0	12	1
• Stage 2: Stakeholder consultation/public debate	NA	0	4	6	2	0	2	12	7
• Stage 3: Drafting or revision	NA	0	1	3	3	1	0	8	2
• Stage 4: Approval (legislative or regulatory)	NA	0	1	2	4	0	1	7	1
• Stage 5: Full and effective implementation	NA	0	1	0	3	3	4	7	5

¹¹ Year 5 and LOP totals reflect changes made to meet new indicator definition. LOP targets not representative of changes made to meet new reporting requirements. Final LOP

Table 2. Project/Custom Level Indicators Targets for Life of Contract

Indicator	Baseline	Year 0.5 Apr 2011 – Sep 2011	Year 1 Oct 2011 – Sep 2012	Year 2 Oct 2012 – Sep 2013	Year 3 Oct 2013 – Sep 2014	Year 4 Oct 2014 – Sep 2015	Year 5 Oct 2015 – Aug 2016	LIFE OF CONTRACT TARGET	LIFE OF CONTRACT ACTUALS
1.1.1 Volume of improved seed available in domestic market ¹²	26,545 tons	0	0	0	NR	NR	NR	36,000 tons	40,178 ton
4.1.1 Number of research outputs	NA	0	3	4	3	2	5	7	17
4.1.2 Total number of SERA mentions in the press and social media	NA	0	10	11	2	0	0	40	23
4.1.3 Number of hits/visits to the SERA website	NA	0	0	0	0	3,860	1,114	9,000	4,974
4.2.1 Number of institutions receiving USG assistance	NA	0	2	12	11	24	25	15	89

¹² Data available reported September 2015. *MALF*.

V. EVALUATION OF THE PROGRESS TO OBTAIN THE RESULTS

This section provides information on how the indicator targets were derived, challenges faced, and why a target was not met. During the life of the project, USAID Tanzania changed the operating Monitoring and Evaluation (M&E) framework twice, and various FtF indicators were revised and updated. In addition, the SERA Project took part in a Data Quality Analysis report in 2013, resulting in the Performance Management Plan (PMP) modification. The SERA Project-approved PMP was revised in October 2013 and again in April 2016 to account for the above-stated changes.

A. SERA Project PMP Revisions: October 2013

The revised PMP for the USAID SERA Project was based on the collective experience of USAID's Tanzania FtF Implementing Partners of Project Year 1 and specific changes to indicators are a result of changes to the FtF Indicator Handbook.

Standard/Required Indicator Changes:

IR 4.5.2-7, Number of individuals who have received U.S. Government (USG)-supported short-term agricultural sector productivity or food security training, **replaces** IR 8.2.1, Number of individuals who have participated in USG-supported training activities.

- **Rationale:** Data Quality Analysis (DQA) recommendation. Training support research and policy analysis relevant to indicator definition.

IR 4.5.2-25 was eliminated from the PMP.

- **Rationale:** Regional-level indicator, collected by regional missions. USAID SERA does not have the capacity to adequately report on indicator 4.5.2-25.

Custom Indicator Changes:

IR 8.2.3, Number of policy seminars conducted.

- **Rationale:** This activity was done in collaboration with iAGRI and is reported by iAGRI

IR 8.2.4, Number of communications products produced and disseminated

- **Rationale:** Eliminated because of program direction change.

2013 FTI Indicator 4.5.1 (24) Number of Policies/Regulations/Administrative Procedures in each of the following stages of development as a result of USG assistance in each case:

- Stage 1: Analyzed
- Stage 2: Drafted and presented for public/stakeholder consultation
- Stage 3: Presented for legislation/decrees
- Stage 4: Passed/approved
- Stage 5: Passed for which implementation has begun (S)

Stages 1 and 2 = Output

Stage 3, 4, and 5 = Outcome

B. SERA Project PMP Revisions: April 2016

The purpose of this modification to the SERA Policy Project PMP is to address changes in the policy activities and align the PMP with revised indicator 4.5.1 (24). These changes will address the evolution and subsequent development of new policy activities that have resulted from SERA's work program, and adjust the policy action targets based on revised 2014 indicator definition.

Revised 2014, Indicator 4.5.1 (24)

- Stage One - Analysis
- Stage Two - Stakeholder consultation / public debate
- Stage Three - Drafting or revision
- Stage Four - Approval (legislative or regulatory)
- Stage Five - Full and effective implementation

C. USAID Standard and Required Feed the Future Indicators

1. IR 4.5.2-7, Number of individuals who have received USG-supported short-term agricultural sector productivity or food security training

Indicator IR 4.5.2-7 replaced custom indicator *IR 8.2.1, Number of individuals who have participated in USG-supported training activities* based on the recommendations of the 2013 Data Quality Analysis Report completed by the FtF implementing partner, The Mitchell Group.

The SERA Project designed and implemented individual and institutional capacity building activities. The training was designed with the goal of long-term increased organizational capacity to conduct research and policy analysis. Institutional-level training activities were based on capacity-building action plans. Training was designed to build on previous learned skills, thereby strengthening the institution.

The SERA Project designed training for two categories of participants: public sector, both GOT and RGOZ, and private-sector organizations.

The rationale for the indicator is to measure enhanced capacity for increased agricultural productivity, improved food security, policy formulation and implementation. The desired output is stated as "higher is better." In accordance with FtF Indicator Guidelines, individuals are counted only once per year. This measurement is not representative of the project objectives. As a result, the SERA Project tracked both new and continuing training participants.

Targets were based on the following assumptions:

- Policy activity *Credit to Small Shareholders and SMEs/Collateral Registry* under indicator 4.5.1-24 reached *Stage 5 - Full and effective implementation* and the following training would be required:
 - Collateral registry administrators
 - Collateral registry users, banks, and financial institutions
 - Beneficiaries of financial products that use the Collateral Registry System.
- GOT MAFC Department of Policy and Planning (DPP), NFRA, Department of Food Security would be the primary beneficiaries of training for improved research and policy analysis.
- Agricultural organizations would provide capacity-building support and training to improve policy research, analysis, and advocacy.

Life of project targets: 1,700 individuals

Actuals: none.

Deviation narrative:

- Policy activity *Credit to Small Shareholders and SMEs/Collateral Register* under indicator 4.5.1-24 did not reach Stage 5, *full and effective implementation*. No training took place.
- Capacity building activities to support the DPP were delayed because of changes in leadership.
- The NFRA received capacity-building support from other donors (PRC China).
- In 2013, targets were adjusted based on delays in the implementation of policy activity *Credit to Small Shareholders and SMEs/Collateral Registry*.
- SERA Project success working with the GOT led to potential conflicts of interest support to private-sector advocacy. Revision to the PMP in 2013 reflects changes in targets.

2. IR 4.5.2-30, Number of Micro, Small and Medium Enterprise (MSME), including farmers, receiving USG assistance to access loans

This is a standard indicator and was included in the SERA Project PMP to track progress on the implementation of the *Credit to Small Shareholders and SMEs/Collateral Registry* activity. This indicator is directly linked to progress in policy action stages for the *Credit to Small Shareholders and SMEs/Collateral Registry* activity.

Life of project targets: Medium, 2,400; Small, 350; Micro, 250.

Assumptions: Targets for this activity assumed the successful adoption of a Collateral Registry system, subsequent training for financial institutions and beneficiaries, and access to new financial products.

Actuals: 0

Deviation narrative:

- Revisions to targets were made in the PMP revision 2013 to reflect delays in implementation.
- This activity did not progress beyond *Stage 1, Analysis*, because of other priorities and demands of key Tanzanian stakeholders; therefore, subsequent activities affecting IR 4.5.2-7 and IR 4.5.2-30 could not occur.

3. IR 4.5.2-36, Value of exports of targeted agricultural commodities as a result of USG assistance

This indicator relates to the impact of SERA research and policy reforms on specific policies related to the exportation of maize and rice.

Policy activities that contribute to this indicator include export ban, transparent rules-based system for emergency food imports, and export permits.

Related research activities include business environment for agriculture, land compensation schemes, and improved markets for maize and rice.

Activity summary: The target was to increase the value exports of maize due to USG assistance by 37 percent by 2015.

Life of project target: Maize, \$56,749,200; Rice, NA

Assumption: That the SERA Project could improve price incentives to maize producers and that would increase exportable supplies and exports.

Actuals: The actual increase in exports of both maize and rice exceeded our targets and a significant part of that increase can be attributed to SERA Policy research and USG assistance. Maize exports increased from USD20.82 million in 2010 to USD130.58 million in 2015 and the value of rice exports increased from USD51.96 million to USD107.69 million over the same period. Deviation narrative: The increase in the value of exports was due to (1) increased price incentives to farmers, which led to increased production, and (2) the government’s lifting of the export ban in 2012, which allowed exports to move more freely to markets in neighboring countries. From 2005 to 2011, the government banned exports five times and in the period from 2012 to 2016 there were no export bans.

4. IR 4.5.1-24, Number of agricultural and nutritional enabling environment policies completing the following process/steps of development as a result of USG assistance in each case: 1: analysis, 2: stakeholder consultation/public debate, 3: drafting or revision, 4: approval (legislative or regulatory), 5: full and effective implementation. Revised 2014

FtF guidance for indicator 4.5.1-(24) has evolved over the SERA Project contract period. Changes to the SERA Project targets were first accommodated in the revised PMP of October 2013. The 2013 revisions addressed changes in FtF indicator guidance and the evolution of new policy activities. The indicator definitions for 4.5.1-(24) did not account for the fluid and iterative policy process, and this seriously limited the accuracy of Implementing Partner (IP) reporting. In addition, that process did not allow the SERA Project to take on new policy actions that emerged or were requested by key stakeholders. The official FtF M&E reporting system, Feed the Future Monitoring System (FTFMS), could also not accommodate the addition of new policies or accommodate double counting that is part of the iterative policy process.

4.5.1 (24) 2012 definition
Stage 1: Analyzed
Stage 2: Drafted and presented for public/stakeholder consultation
Stage 3: Presented for legislation/decreed
Stage 4: Passed/approved
Stage 5: Passed for which implementation has begun (S)

FtF guidance for 2014 included a revised and updated indicator 4.5.1-(24). Changes to indicator 4.5.1-(24) recognized the fluid and changing nature of policy reform and the evolutionary process of research and policy dialogue and policy reform. The revised definition acknowledges and allowed double counting to more accurately reflect the policy process. The definitions of specific stages better meet the realities of the policy formulation and reform process.

Twenty specific policy actions were tracked in SERA Project’s period of performance. Several policy activities were completed.

The following is a summary of each policy action through the life of project (LOP).

Export Ban¹³

Type of policy: Administrative Action

Responsible authority: Director of NFSD, MAFC

Policy area: Resilience and agricultural risk management policy

Activity summary: The objective of this activity is to conduct evidenced-based research and present findings to the GOT on the negative impact of the export, to support lifting the ban. Life of project target: Stage 5, Passed for which implementation has begun, Year 1.

Stage 1, Analyzed: The export ban was initiated in Project Year 1, 2011/12 with the drafting and circulation of a concept note, October 2011. Three statements of work (SOW) for research study were prepared and three groups of consultants were engaged: AIRD for a Study of Policy Options for Increasing Tanzanian Exports of Maize and Rice in East Africa While Improving Its Food Security to the Year 2025; IFPRI for an Economy-wide Impact of Maize Export Bans on Agricultural Growth and Household Welfare in Tanzania—A Dynamic Computable General Equilibrium (CGE) Model Analysis; and USDA for an Assessment of Policy Options and Information Needs to Address Food Security in Tanzania. Research was conducted in Year 1, Quarter 2.

Stage 2, Drafted and presented for public/stakeholder consultation: The research findings of the three SOWs were presented to stakeholders for consultation in several informal meeting and in a formal session of representatives from Agricultural Line Ministries, chaired by the PS of the PMO in Dodoma June 2012. The research was presented for public debate at Kunduchi Beach in June 2012.

The PMO requested additional research on the following issues:

- The development of a Food Basket Approach in the Tanzania Food Security System
- Further analysis and recommendations on role and function of NFRA: level of food stocks
- The application and use of export permits.

These policy activities were added to SERA Project's work plan in Year 2.

Stages 3 and 4: Not applicable.

Stage 5, Passed for which implementation has begun: The export ban was lifted in Year 1, Quarter 4. Tanzanian Prime Minister Pinda announced the lifting of the food crops export ban and credited the “clear and convincing” evidence provided by the SERA Project as the reason for the policy change.¹⁴ This action met the definition criteria in 2012 and completed the policy reform process and implementation of revised administrative procedure by relevant authority. This has been sustained for 5 years. The lifting of the ban has provided farmers with improved prices since 2012 and that has increased incomes and allowed greater investments. If the export ban is imposed it will reduce incentives for farmers to produce a maize surplus and push the sector back to subsistence levels where farmers only produce for their household needs. Efforts are needed to inform GoT officials of the importance of

¹³ This activity was completed under the first definition for 4.2.1 (24) and is therefore reported under that definition.

¹⁴ *The Citizen*, “Ban on export of food to be lifted,” page 1, September 7, 2012.

The Daily News, “Export ban hurting agriculture—Study,” page 3, September 7, 2012.

allowing exports to neighboring countries and continuing the very effective policies of the past five years.

Assumptions: Strong interest from GOT counterparts and USAID FtF leadership made this SERA Project's priority activity. It was assumed that this interest reflected a desire for alternative policy options to the use of export bans.

Actuals: Project goal attained.

Deviation narrative: NA

Cereals and Other Produce Act completed under indicator definition 2012

In Year 1, the SERA Project sought to identify common areas of interest and priorities with the GOT, specifically the MAFC. Among the early recommendations was the suggestion to review the Cereals and other Produce Act and subsequent board in an effort to minimize intervention in the private sector while meeting the needs of smallholder rural producers. The SERA Project with the EACG conducted an initial review and found the activity did not align with SERA Project objectives. These policy actions were dropped at the end of Year 2.

Credit to Small Shareholders and SMEs/Collateral Registry

Type of policy: Legal Frameworks

Responsible authority: Legislator

Policy area: Enabling environment for private-sector investment

Activity summary: The objective is to create a legal framework and collateral registry to support the use of movable assets as collateral by lenders and thereby improve access to credit for smallholders and SMEs. This activity is a legacy activity from the USAID BizCLIR project. The purpose of this policy activity is to support the creation and operationalization of a Collateral Registry System in Tanzania that will allow for the use of movable assets as collateral.

Life of project target: Stage 5, full and effective implementation. Year 4.

Stage 1, Analyzed: Underwent analysis in 2011. Analysis was reinitiated in 2014 and included meetings with various stakeholders, a review of existing legislation, and drafting proposed legislation. In addition, a policy brief was prepared and circulated to the public regarding the benefits of a Collateral Registry System.

Stages 2 to 5: Not attained

Assumptions: Supportive and engaged stakeholders, specifically the BoT and the MoF and a consistent and transparent policy/legislative process.

Actuals: Stage 1.

Deviation narrative: This activity was initiated under a previous USAID activity. The SERA Project continued the efforts, using the same resources. It was assumed that by using the same resources, there would be minimum disruption in the progress. However, by Year 2 it became apparent that new technical resources were needed. At this time, the SERA Project learned of the revised internal processes for the development, proposal, and introduction of new legislation. In Year 3, the SERA Project identified new resources and partners, including

the World Bank. The GOT made a direct a commitment to the creation of the Collateral Registry in the 2014 Financial Inclusion Act, thus taking ownership of this activity. BoT has made progress toward establishing international processes to move the activity forward with the establishment of a committee to work on the activity in 2015. The creation of the committee ensures that the activity will be reported on a regular basis and in 2016 the BoT began working with the MoF. The activity remains in Stage 1, pending action by stakeholders.

Significant progress was made with the ownership and commitment by the GOT to move the Collateral Registry forward in the 2014 Financial Inclusion Act. This important activity is now established as a priority of GoT and supported by the World Bank.

Food Security—Mainland

Type of policy: Administrative Action

Responsible authority: Director of NFSD, MAFC

Policy area: Resilience and agricultural risk management policy

Activity summary: The objective of this activity is to improve the food security assessment systems of the NFSD. The policy action was added to SERA Project’s work plan as a result of the USDA’s Assessment of Policy Options and Information Needs to Address Food Security in Tanzania 2012, a research presentation in Dodoma to the GOT Agricultural Line Ministries stakeholders. This activity explored two options for utilization within the NFSD, (1) implementation of the FBM within the crops and early warning unit as part of the preliminary forecast, and (2) application within the MUCHALI rapid assessment system.

Life of project target: Stage 5, full and effective implementation. Year 4.

Activity A. Preliminary Forecast	Activity B. MUCHALI
Implementation of the FBM within the crops and early warning unit (EWU).	Review the current food security assessment process in the context of the MUCHALI framework and identify that framework’s information needs and the gaps in the information currently available.
Stage 1, Analysis:	
In 2013, USDA ERS and the SERA Project conducted a feasibility study on the creation and implementation of an FBM for measuring food access in Tanzania.	In 2014, the Chairperson of MUCHALI, the Food Security Rapid Assessment Program jointly chaired by PMO Disaster Management Department and the MAFC, requested an analysis of the MUCHALI system. In 2015, the SERA Project completed the assessment of Tanzanian early warning data systems.
Stage 2, Stakeholder Consultation/Public Debate:	
Research paper, Food Basket Analysis: A Tool for Measuring Food Access in Tanzania (2013), was presented to government stakeholders at a meeting of representatives from Agricultural Line Ministries chaired by the former PMO PS.	The SERA Project presented the findings of this report in August 2015.
Stage 3, Drafting or Revision:	
SERA/USDA worked closely with MAFC-NFSD to refine the FBM tool through a series of training sessions (2014), consultative meetings (2015), and pilot activity (2016) to test the methodology.	Further revisions and drafting took place in 2016.

Stage 4, Approval (Legislative or Regulatory):	
<i>Not attained.</i> Support for the adoption of the methodology exists within the PMO and the MAFL Department of Policy and Planning; however, the NFSD is still in the process of determining the best application of the methodology in the national early warning assessment system.	<i>Not applicable</i>
Stage 5, Full and Effective Implementation:	Stage 5, Full and Effective Implementation:
<i>Not attained.</i>	<i>Not attained.</i>

Assumptions: (1) This activity was requested by the leadership of the National Food Security Department; it was assumed that under the director’s leadership, the department would explore and adopt the FBM; (2) it was assumed that data from sources other than the National Food Security Department would be acceptable for use in analysis; and (3) it was further assumed that data sources would be sufficient to support subnational analysis requirements.

Actual: Stage 3, Drafting or revision.

Deviation narrative: (1) Leadership and buy-in from stakeholders in the National Food Security Department took longer to develop than anticipated.

(2) The EWU expressed serious concerns about the source and validity of the data used in the FBM Feasibility Study. The EWU did not approve of regional-level data to support subnational analysis. In addition, income data is only available at the regional level. Food security analysis requires district level data on food costs and income.

3) The FBM was a new activity and required a significant time commitment from the participants. The annual calendar of data collection and field validation made continuous training and access difficult to sustain, at times putting the FBM activity at odds with the needs of the existing system.

The SERA Project and USDA ERS made program adjustments in Year 4 to better meet the needs and realities of the EWU’s capacity. In Year 5, the SERA Project and ERS had identified alternative data sources and had piloted new efforts. The activity will continue under the direction of USDA ERS.

NFRA

Type of policy: Administrative Action

Responsible authority: Director of NFSD, MAFC

Policy area: Resilience and agricultural risk management policy

Activity summary: The 2012 SERA Project’s presentation to GOT stakeholders resulted in a request from the PMO to assess the role and function of the NFRA and investigate alternative safety-net models. AIRD conducted this policy activity under the USAID FtF NAFKA project. NFRA is a semi-autonomous GOT agency under the authority of the MAFC/MALF.

Life of project target: Stage 5, Full and effective implementation, Year 4.

Analysis of NFRA, 2012–2013	Alternative Approaches to Holding Grain Stock 2013–2016
Stage 1, Analysis:	
Evidence-based research was conducted on the mandate and functions of the National Grain Reserve, Tanzania’s NFRA’s role in ensuring food security (2013).	Based on feedback on the presentation of Tanzania’s NFRA’s Role in Ensuring Food Security (2013), additional analysis was conducted on Tanzania’s reserves, optimal levels, and other alternatives to holding physical grain stocks. Revised and extended: recommendation for improving emergency food reserves. (2015).
Stage 2, Stakeholder Consultation/Public Debate:	
Research was presented to public and private-sector stakeholders in 2014.	Recommendations for improving emergency food reserves (2015) were presented as part of the Tanzania Policy Options for Food Security, Agricultural Development, and Poverty Alleviation. Presented to the GOT in 2015 and in final draft form in February 2016 at the Second Annual Agricultural Policy Conference.
Stage 3, Drafting or Revision:	
The GOT requested further analysis on the optimal amount of stock to hold in the NFRA.	None.
Stage 4-5	
<i>Not attained.</i>	

Assumptions: The operations and effectiveness were issues identified in AgCLIR. The issue also emerged as part of the export ban analysis, and it was assumed that recommendations on the National Grain Reserve would be well received. It was not known that NFRA was receiving donor assistance from China.

Actual: This activity advances through Stages 1–3 over the life of the project.

Deviation narrative: The SERA Project underestimated political sensitivities regarding these issues. In addition, NFRA was receiving assistance from China for capacity building, resulting in zero demand for support from the SERA Project. Despite these setbacks, SERA Project work on NFRA along with the 2014 surplus harvest of maize resulted in renewed interest in the research. SERA Project research has been used as a catalyst for research conducted directly by the MAFC.

Export Permits

Type of policy: Administrative Action

Responsible authority: Director of NFSD, MAFC

Policy area: Agricultural trade policy

Activity summary: The objective of this activity is to revise the system of export permits that required MAFC-NFSD Director approval for all grain exports. The MAFC/MALF is the responsible authority for this administrative action, and its authority is derived from Cereals and Other Produce Act.

Export permits are issued free of cost to approved exporters by the Director of Food Security in Dar es Salaam. The Assistant Director was authorized to issue permits as well in 2014. The stated purpose of the export permit system is to monitor the movement of grains leaving

Tanzania for export markets. It is unknown what criteria are used to approve permit applications, how the permits are evaluated against current stock evidence, and what system or institution is tracking the total exports.

Life of project target: Stage 5, Full and effective implementation. Year 3.

Stage 1, Analysis: Analysis of the export ban revealed systems of export permits, requiring exporters of grains to receive permits from the Director of the National Food Security Division. Evidence-based research was conducted in 2013 and a research paper was written: *Assessing the Role of Export and Import Policies on Staple Foods in Tanzania (2013)*.

Stage 2, Stakeholder consultation/public debate: The research was presented to public and private-sector stakeholders in 2013.

Stage 3 and 4: Not applicable

Stage 5, Full and effective implementation: Not attained

Assumptions: *The export permit is an administrative issue that can be changed immediately without legislation.*

The SERA Project understood that the export permit system was part of the export ban procedures. This understanding was the result of discussions with senior GOT administrators. Research efforts on the export ban led to knowledge of the use of export permits, outside of the export ban. This was new information to many government stakeholders. Stakeholders expressed their concern about the system, specifically the purpose and use of export permits during times of free trade (no export bans).

Actual: Stage 2.

Deviation narrative: The export permit system is not part of the export ban procedures and is considered part of the powers of the MALF derived from the Cereals and Other Produce Act. In 2014 the export permit system was decentralized to the Regional Administrative Secretaries; however, implementation was inconsistent and raised concerns regarding unfair practices and rent-seeking behaviours. In 2015, the export permit system reverted to a centralized system.

Seed Taxes

Type of policy: Regulatory

Responsible authority: MoF

Policy area: Agricultural input policy

Activity summary: The objective of this policy activity is to revise and reduce to zero the tax on seeds and seed packaging materials. This is a legal and regulatory change that occurs in the annual budget process, led by the MALF, approved and proposed by the MOF and passed by Parliament. Taxes on seeds and seed packaging materials increase the costs of seeds which should be exempt because they are an agricultural input. The current system encourages imports of seeds already packaged and discourages local packaging which creates a disadvantage to the local seed industry.

Life of project target: Stage 5, Full and effective implementation. Year 3.

Stage 1, Analysis: The SERA Project worked closely with the MAFC DPP and TASTA and drafted a proposal and justification for the removal of VAT tax on seeds and seed packaging. This work was completed in 2013.

Stage 2, Stakeholder consultation/public debate: The SERA Project, working closely with TASTA, supported the MAFC DPP proposal for the removal of VAT on seed and seed taxes. Presentations for budgetary changes were made to the MoF in 2013, 2014, 2015, and 2016. The MoF failed to include the proposal in annual budget proposals each year.

Stages 3 to 5: No action taken.

Assumptions: The political will of the MAFC would be supported by the MoF.

Actual: Stage 2.

Deviation narrative: Despite strong support from the MAFC and the private sector, the MoF failed to include the proposed VAT revision in the annual budget proposals for four years. The SERA Project believes that limited tax revenue and election year pressures are the primary delays for this activity.

Seed Policy Modified 2016

Life of project target: Stage 5, Full and effective implementation. Year 5.

This policy activity was disaggregated for final reporting.

Seed Policy—Access

Type of policy: Administrative and Regulatory Actions

Responsible authority: MAFC/MALF Plant Breeders' Rights Registry

Policy area: Agricultural input policy

The objective of this policy action is to improve private sector access to protected government-developed seeds. The MAFC produced a Circular in 2011 that outlined the conditions for release of protected seed varieties produced in publicly supported Agricultural Research Institutions. However, the conditions were not favorable to the private sector and that discouraged the private sector from licensing the protected varieties.

Life of project target: Stage 5, Full and effective implementation. Year 5.

Stage 1, Analysis: Not applicable

Stage 2, Stakeholder consultation/public debate: The SERA Project supported stakeholder consultation and public-private sector dialogue through a series of seven workshops over five years with the MAFC/LF and TASTA.

Stage 3, Drafting or revision: No drafting of administrative and regulatory actions was required.

Stage 4, Approval (legislative or regulatory): No approval of administrative and regulatory actions was required.

Stage 5, Full and effective implementation: The MALF issued public tenders to access to public seed varieties, taking into consideration the concerns of the private sector. Responses to the tenders were limited; continued MALF and private-sector dialogue is required for continuous improvements. Three companies have been approved. The approval of other companies is in progress.

Assumptions: The MAFC had to engage with the private sector to discuss concerns and obstacles.

Actual: Stage 5, Year 5.

Deviation narrative: None.

Seed Policy—ISTA and OECD

Type of policy: Administrative Action

Responsible authority: MAFC (Mainland) and MANR (Zanzibar)

Policy area: Agricultural input policy

Activity summary: The objective of this policy is to comply with ISTA and OECD standards which will allow seeds produced in Tanzania to be exported to the region.

Life of project target: Stage 5, Full and effective implementation. Year 5.

Stage 1, Analysis: No analysis was required.

Stage 2, Stakeholder consultation/public debate. The SERA Project supported stakeholder consultations and public-private sector dialogue through a series of seven workshops over five years with the MAFC/LF and TASTA.

Stage 3, and 4. No action required.

Stage 5, Full and effective implementation: Tanzania Official Seed Certification Institute (TOSCI) has completed all requirements to meet laboratory standards. ISTA is now undergoing the final evaluations. The OECD request for application, accepted in June 2016, is now awaiting internal procedures from OECD.

Assumptions: All stakeholders were committed to meeting the accreditation requirement of ISTA/OECD, and the GOT MAFC would lead this process. Public-private sector dialogue would be required through a series of workshops to support the revisions of existing legislation.

Actual: Approval (legislative or regulatory). Stage 5, Year 5.

Deviation narrative: Not applicable.

Seed Policy—UPOV

Type of policy: Regulatory

Responsible authority: Prime Minister's Office

Policy area: Agricultural input policy

Activity summary: The objective of this policy is for Tanzania to comply with The International Union for the Protection of New Varieties of Plants (UPOV) standards and receive accreditation. This is a regulatory action and required revisions to the Plant Breeders' Right Law that better explained the role of the private sector.

Life of project target: Stage 5, Full and effective implementation. Year 5.

Stage 1, Analysis: No analysis was required.

Stage 2, Stakeholder consultation/public debate. The SERA Project supported stakeholder consultations and public-private sector dialogue through a series of seven workshops over five years with the MAFC/LF and TASTA.

Stage 3, Drafting or revision. The MAFC/LF led the drafting of revised legislation.

Stage 4, Approval (legislative or regulatory). The Parliament of Tanzania (Mainland) and the Revolutionary Council (Zanzibar) passed the revised Plant Breeders' Right legislations in 2015. The new legislation meets the requirements of UPOV.

Stage 5, Full and effective implementation: The GOT has finalized the legislative and documentation requirement of UPOV. Submission of the UPOV application was completed in September 2015; approval of UPOV received in November 2015.

Assumptions: All stakeholders were committed to meeting the accreditation requirement of UPOV, and the GOT MAFC would lead this process. Public-private sector dialogue would be required through a series of workshops to support the revisions of existing legislation.

Actual: Approval (legislative or regulatory). Stage 5, Year 5.

Deviation narrative: Not applicable.

Land Compensation

Type of policy: Regulatory

Responsible authority: MLHHS

Policy area: Land and natural resources tenure, rights, and policy area

Activity summary: The objective of this activity is to conduct evidenced-based research of various land compensation schemes and provide guidance on alternatives to land for equity. Only one-quarter of the land suitable for crop production in Tanzania is used for that purpose and the main reason is that it is difficult for those who occupy the land under informal or triable tenure to provide the land to investors and still retain their rights to the land. This study researched the legal rights of local communities to lease their land and concluded that it was possible and being done in some areas.

Life of project target: Stage 2, Stakeholder consultation/public debate. Year 3.

Stage 1, Analysis: Research and analysis for this activity took place in project Year 3. The final report, Land Compensation and Benefit Sharing Schemes, was produced by SERA subcontractor Landesa.

Stage 2, Stakeholder consultation/public debate: The final report was presented to stakeholders at the second Annual Agricultural Policy Conference, February 2016.

Assumptions: The SOW called for public stakeholders to gather to review and discuss research. The MLHHS requested this support and it was assumed that it would provide the leadership required to organize the event.

Actual: Stage 2, Year 5.

Deviation narrative: The SERA Project experienced delays in achieving the policy target because of several key factors. Changes in the leadership of the Ministry required a re-introduction of the topic and paper. New leadership was reluctant to provide comments and approve the final report, resulting in revisions in the final draft.

Improving Performance of Maize and Rice Markets

Type of policy: Administrative Procedures, Regulatory Frameworks and Institutional Arrangements

Responsible authority: PMO and MAFC/MALF

Policy area: Agricultural trade policy

Activity summary: The objective of this activity was to improve the efficiency of maize and rice markets by understanding the impact of policies on maize and rice price adjustments and regulations on exports and imports.

Life of project target: Stage 2, Stakeholder consultation/public debate. Year 4

Stage 1, Analysis. Research and analysis for this activity was completed in the following reports: The Driver of Maize Prices, 2014, and The Cross-Border Transmission of Price Shocks, Evidence from Tanzanian Food Markets, May 2016.

Stage 2, Stakeholder consultation/public debate. The Drivers of Maize Prices paper was presented at the First Annual Agricultural Policy Conference and submitted to the World Bank's *Economic Review* for publication. The Cross-Border Transmission of Price Shocks Evidence from Tanzania Food Markets has been accepted for presentation at a conference in Rabat, Morocco, September 28-29, 2016.

Assumptions: That the GOT would have a better understanding of the operation of these markets which would lead to better policies and better market performance.

Deviation narrative: The first research paper, the Drivers of Maize Price, met the LOP target. This research activity evolved to include the development of the second paper, Cross-Border Transmission of Price Shocks Evidence from Tanzania Food Markets, which was delivered in Year 5.

Transparent and Rules-Based Import Policy (Emergency Food Import Policy)

Type of policy: Administrative procedures, institutional arrangements

Responsible authority: MALF

Policy area: Enabling environment for private-sector investment/resilience and agricultural risk management policy

Activity summary: This activity evolved through the process of research and policy dialogue and policy reform. The objective of this activity was to provide the GOT with evidenced-based research and recommendations for the creation of a transparent rules-based import policy, specifically targeting rice.

Life of project target: Stage 5, Full and effective implementation. Year 5.

Activity, Rice Sector Analysis	Activity, Transparent Rules-Based Systems	Activity, Market Intelligence Unit
Stage 1, Analysis		
In January 2013, the SERA Project conducted a rapid analysis of the domestic rice market at the request of the GOT regarding reported shortages.	Final revisions and recommendations prepared in the Tanzania Policy Options for Food Security, Agriculture, and Poverty Alleviation Paper in 2014–15.	Conduct a feasibility study on the establishment of an MIU and support the establishment of a transparent rules-based emergency imports system, 2016.

Stage 2, Stakeholder Consultation/Public Debate		
Shared research with GOT and industry stakeholders in a series of formal and informal meetings, working closely with SAGCOT. Presented research and recommendations to the PMO in 2014.	Presented recommendations to PMO 2015 in Policy Options for Food Security and Agriculture. Final presentation of the Transparent Rules-Based Import System for stakeholder consultation and subsequent training of GOT staff completed in July 2016.	<i>Not attained.</i>
Stage 3, Drafting or Revision		
Feedback from the GOT directed the SERA Project to research the feasibility of establishing a transparent rules-based import policy, specifically targeting rice.		
Stage 4, Approval (Legislative or Regulatory)		
	In September 2015, GOT/MALF requested support for the feasibility and design of an MIU.	
Stage 5, Full and effective implementation		
<i>Not attained.</i>		

Assumptions: The demand for a transparent rules-based system emerged from both the public and private sector and was championed by the PMO. A rules-based system is an administrative change and could use existing resources and is low/no cost. This activity was supportive of the Commodity Exchange, a high-priority activity for the GOT.

Actual: Stage 4, Approval. Year 5.

Deviation narrative: The process for creating the necessary institutional infrastructure was not clear when life of project targets were made. While the process has been supported by the GOT, national elections and changes in the structure and personnel of the MAFC (now the MALF) delayed the MIU feasibility study team. This activity will continue under the USAID FtF ASPIRES project.

Agriculture Business Environment Study

Type of policy: Administrative Procedures, Regulatory Frameworks, and Institutional Arrangements.

Responsible authority: PMO

Policy area: Enabling environment for private-sector investment policy area

Activity summary: The objective of this activity was to present evidenced-based research to inform the GOT how Tanzania compares with other countries in the region on key factors influencing the business environment and investment incentives. The study showed that the agriculture business environment in Tanzania is poor and not competitive within the region and substantial new incentives would be needed to attract large domestic or foreign investors.

Life of project target, Stage 5: Full and effective implementation. Year 5.

Stage 1, Analysis. November 2015–March 2016.

Stage 2, Stakeholder consultation/public debate. The draft paper was presented in February 2016 at the Second Annual Agricultural Policy Conference. Final draft presented in April 2016, Year 5.

Stage 3, Drafting or revision. Revisions took place in Quarters 2/3 of Year 5.

Stages 4 and 5: Not attained.

Assumptions: The BoT foreign investment report of 2012 demonstrated that agricultural investment was a fraction of investment in other sectors. The GOT high-profile activities promoting agricultural investment, including CAADP, SAGCOT, the New Alliance, and BRN indicated a high priority on addressing the challenges in the business environment and investment. Initial discussion with stakeholders indicated an interest in partnering with SERA on this activity.

Actual: Stage 2, Year 5

Deviation narrative: The SERA Project had planned to start this activity in 2013; however, demands for immediate support regarding the rice sector by the GOT and private sector took over resources dedicated to this activity. The activity was further delayed because of national elections in 2015.

Zanzibar Food Basket Methodology

Type of policy: Administrative Action

Responsible authority: Director of FSND, MANR

Policy area: Resilience and agricultural risk management policy

Activity summary: The objective of this activity is to develop an FBM for adoption by the FSND—Zanzibar as part of the food security early warning system.

Life of project target: Stage 5, Full and effective implementation. Year 5.

Stage 1, Analysis. The SERA Project working closely with USDA began to develop the FBM in Year 4.

Stage 2, Stakeholder consultation/public debate. The process of developing the FBM was collaborative and involved hands-on training of the department personnel. The system was presented to stakeholders in Year 4.

Stage 3 and 4: Not applicable.

Stage 5, Full and effective implementation: In the last quarter of Year 4, FSND began producing quarterly Food Basket reports as part of its internal early warning reporting.

Assumptions: The FSND expressed interest in the FBM system and was available to participate in the training and development; demand for the FBM was high.

Actuals: Stage 5, Year 5.

Deviation narrative: None.

Zanzibar Rice Imports Market Analysis

Type of policy: Administrative Action

Responsible authority: Director of NFSD, MANR

Policy area: Resilience and agricultural risk management policy

Activity summary: The objective of this activity is to provide the RGOZ with evidenced-based research on the importance of rice imports to Zanzibar food security.

Life of project target: Stage 5, Full and effective implementation. Year 4.

Stage 1, Analysis. A detailed analysis of the Zanzibar rice market was completed in Years 1 and 2 of the SERA Project. Zanzibar is very dependent on the world market for rice imports and a few large importers and that is a concern of Government. The SERA project was asked by Government to provide information on the global rice market and study the behavior of rice importers.

Stage 2, Stakeholder consultation/public debate. Research findings were presented at a closed-door meeting of RGOZ stakeholders in September 2013.

Stage 3–Stage 5. No activity

Assumptions: Research was valuable to the NFSD and could be used in the development of an early warning system.

Actual: Stage 2, Year 2.

Deviation narrative: The policy activity goal was set before having a clear understanding of the political sensitivities of the rice market in Zanzibar.

Zanzibar Rice Irrigation Analysis

Type of policy: Administrative Action

Responsible authority: Director of NFSD, MAFC

Policy area: Resilience and agricultural risk management policy

Activity summary: The objective of this activity is to provide USAID and the RGOZ with evidenced-based research on the production (and market) potential of rain-fed and irrigated rice. The objective of the paper was to show that Zanzibar can meet its objective of meeting 50 percent of its domestic demand from its own production.

Life of project target: Stage 2, Stakeholder consultation/public debate. Year 4.

Stage 1, Analysis. The SERA Project, working closely with the NAFKA project, conducted an analysis of production and market potential of rain-fed and irrigated rice on Zanzibar. The final paper was delivered in July 2014.

Stage 2, Stakeholder consultation/public debate. The SERA Project presented the report findings to USAID FtF and MANR stakeholders in May 2014.

Assumptions: USAID requested this special study to help guide investment policy in Zanzibar.

Actual: Stage 2, Year 3.

Deviation narrative: None.

D. SERA Policy Project Custom-Level Indicators

1. 1.1.1. Volume of improved seed available on the domestic market

Activity summary: The indicator measures the impact of policy changes that reduced the cost of seeds, expected to result in an increase in the amount of improved seed sales. The measurement is the volume (tons) of improved seeds sold by registered seed dealers, including open pollinated crops and hybrid seeds. Note, data for this indicator is only available for the January–December annual reporting periods. Life of project data is reported.

Life of project target: 36,000 tons

Assumptions: Changes in the policy environment related to access to seed public varieties will continue to be implemented. New Alliance commitments would be carried out by the GOT.

Actual: 40,178 tons (September 2015)

Deviation narrative: Assumptions for this indicator did not take into consideration the development of regional seed agreements. The implementation of regional seed agreements, Southern Africa Development Community (SADC) and East African Community (EAC), have allowed for increased importation of improved seed.

2. 4.1.1 Number of research outputs

Activity summary: The number of research products sponsored, co-sponsored, and produced through USG assistance. Research products include research papers, policy briefs, presentations, and concept papers.

Life of project target: 7 Research Outputs

Assumptions: The life of project target was based on known and planned research activities.

Actual Research Outputs: 13 research products.

Deviation narrative: Additional research activities emerged from research and analysis, specifically the food- demand study, gender and maize, drivers of maize prices, drivers of rice prices, and transparent rules-based system.

3. 4.1.2 Total number of SERA mentions in the press and social media

Activity summary: This indicator attempts to track SERA Project impact and reports the number of mentions of SERA Project work in the press and social media. It also includes mentions of USAID FtF policy support activities.

Life of project target: 40

Assumptions: SERA Project's early work on the export ban generated a high level of media attention; it was assumed that this level of interest would continue as the SERA Project developed its advocacy strategy.

Actual: 23

Deviation narrative: The SERA Project developed a strong relationship with GOT stakeholders, requiring the SERA Project to revise its outreach and communications strategy regarding advocacy and media engagement.

4. 4.1.3 Number of hits/visits to the SERA Website

Activity summary: The objective of this activity is to count the number of visitors to the SERA website. Data is collected quarterly through *Google Analytics* software and reported annually by the designated M&E Coordinator.

Life of project target: 9,000

Assumptions: (1) SERA Project website development would be complete in Year 2. (2) SERA Project website approval process would be completed in two quarters.

Actual: 4,382

Deviation narrative: The USAID Bureau of Food Security sought to better organize FtF messaging through a centralized system, requiring the SERA Project to seek exemptions. This process was initially not well defined and therefore resulted in delays. Additional delays occurred in the approval process for the website.

5. 4.2.1 Number of institutions receiving USG assistance

Activity summary: The objective of this activity is to count the number of organizations that have received significant knowledge or skills through interactions that are intentional, structured, and for purposes of imparting knowledge or skills. Activities include study tours, training, workshops, research activities, and support for organizational events.

Life of project target: 14

Assumptions: The SERA Project would work with an equal number of public and private institutions over the life of the project to strengthen institutional capacity.

Actual: 36

Deviation narrative: SERA project's approach to individual and institutional capacity building evolved through the life of project to include capacity building across Agricultural Line Ministries and other GOT institutions, work at the district and regional level (FBM) and capacity building to non-state actors as part of the apex organization.

VI. LESSONS LEARNED

The SERA Policy Project is unique in design and objectives. Established to conduct evidence-based research and work closely with government on policy reform, the SERA Project had to develop new strategies for developing partnerships and trust with public and private sector counterparts. Lessons learned from the SERA Project can provide valuable insight for further support to improve policy in Tanzania.

Among the lessons learned from SERA are (1) that the Tanzanian Government is receptive to changing policies when presented with compelling evidence and working with government has been an effective way to change policies, (2) that major policy change efforts should be directed at whole-of-government not a single Ministry, (3) that policy change efforts should focus on the positive by pointing out opportunities more than weaknesses, (4) that capacity for research and policy analysis in the MALF is not strong, (5) that training and capacity building of staff without strong management support is not effective, (6) that future capacity-building activities should include training of Ministry officials in management and leadership positions, (7) that the SERA Project has benefited greatly from having experienced international and local policy experts as staff, and finally (8) that persistence pays and continuity is important to achieving and sustaining policy reforms.

A. Experience with Improving Policies

The SERA Project directed its efforts to changing policies at the government rather than at the civil society or producer groups for several reasons. Many of the policy issues SERA project worked on were administrative and regulatory issues, and could be changed by Ministries. Ministries make most policy decisions as part of their mandate to implement policies through administrative action instead of legislation and that provides an entry point to influence policies. For example, both the export ban and changes to the import duties taken by the government were administrative actions, not policy changes. SERA Project worked behind the scenes to support the government in policy decisions by providing information and research. Civil society and producer groups are also not always well informed on policy issues and their approach can be adversarial, putting SERA project's relationship with GoT counterparts at risk.

SERA Project used two approaches to provide research and information to the government. The first, which led the government to lift the maize export ban, was to design a research program to address various aspects of the policy and present that research to the government in a workshop. The research was coordinated by SERA but undertaken and presented by international experts. That was effective and convinced the government to lift the export ban. SERA research was cited as the reason for the policy change. This is an approach that can be used to address complex policy issues with many dimensions. The second approach was for SERA staff to quickly address hot topic policy issues and provide analysis and policy guidance, and this was done effectively on the issue of rice imports in 2013. Both approaches were effective and the reason that SERA could do both is they have had significant in-house capacity to design as well as perform research. This has been achieved by pairing an international agricultural policy expert with a local Tanzanian agricultural policy expert. This pairing brings together the cross-country experience, best practices, and research approaches from international work and the knowledge of the local situation, historical context, and political realities in Tanzania. A benefit of SERA having this in-house expertise is that it can engage in high-level policy discussions on an ongoing basis and support the research done by international researchers. It allows SERA to respond to policy issues quickly before more detailed research can be done.

An important lesson learned from SERA is that the willingness to consider policy reforms and listen to evidence-based research varies within the government, and there will be champions and detractors. For example, the Director of Food Security told us in our first meeting that he would be our worst critic. That proved true and we never received his support for any policy reform. However, others in the Ministry of Agriculture and in other branches of government have been more willing to consider policy reforms, and relationships with these officials need to be cultivated because they can be the agents of change. Major policy reform should not be directed at a single Ministry, but instead at whole-of-government to allow officials from other Ministries to contribute to the discussion and policy decision. For example, the lifting of the maize export ban would not have occurred if the policy reform effort had been directed at the Ministry of Agriculture, because it opposed lifting the export ban.

Ultimately, the SERA Project's top quality research, the ability to make and sustain lasting relationships with key government counterparts and change agents along with outreach and

communication efforts helped to embed SERA project research and recommendations into the on-going policy dialogue of Tanzania. Early on, SERA Project demonstrated that they valued the government's input and were willing to talk through sensitive issues. This approach, combined with good research, created trust. This enabled the SERA project to discuss difficult and sensitive issues with the GoT and stakeholders and push politically sensitive issues, such as smuggling and the national grain reserve. The future of this research is difficult to predict, however, the work continues to be an inspiration for further investigation and to be sited in both open and closed-door policy discussions. The research and policy reform work of the SERA Project will live on as long as there is political interest in the issues. The sustainability of the work is owned by the GoT and other related stakeholders who will need to continue research and advocacy efforts.

B. Experience with Capacity Building

The SERA experience with capacity building has been disappointing on the mainland, especially with the Ministry of Agriculture, but much more successful on Zanzibar. On the mainland, SERA has provided three capacity-building activities. Initially, SERA provided institutional capacity building for the ACT, which is a member-based policy advocacy organization. The capacity-building activity went well, but there was never any follow-up on the part of ACT to implement the lessons learned in the training and study tour. A second activity was a policy seminar series introduced and financially supported by SERA at SUA. This activity largely failed because the teams selected to do policy research either did poor-quality research or failed to finish their research projects in a timely manner. This failure was not due to leadership of the seminar series, but more to a lack of commitment by the research teams and inadequate incentives. A third activity was to provide training to Ministry of Agriculture staff on the calculation and use of the FBM to measure food costs. The training was successful, but the methodology is still being revised to meet the department's very specific criteria. In this case, the lack of clear leadership in the Ministry was an important contributing factor to the reluctance of the staff to implement the new methodology. Without a clear mandate from the management, the staff had little incentive to implement the new methodology.

The capacity-building experience on Zanzibar has been very different. SERA has had two capacity-building activities on Zanzibar; an 8-week policy analysis course and an institutional development activity for the FSND. The policy analysis course was well attended and successful and had the support of government. The capacity-building activity for the FSND provided training for institutional goal setting, work planning, communications, and institutional development. This activity was enthusiastically undertaken by staff, and the Director of the Department participated in and supported the capacity-building activity.

Why the large difference between the SERA capacity-building experience on the mainland and Zanzibar? Mostly, it seems to be leadership and incentives. The leadership in Zanzibar was supportive and in the case of the FSND even participated in all training. The policy seminar series was unsuccessful because of the lack of commitment of the participants to complete the activity, and the FBM was unsuccessful because of a lack of support from the director and management of the Ministry. Incentives are obviously an important reason for staff to participate in capacity-building activities, and leadership can provide incentives by participating and rewarding staff who

engage in these activities. In the case of the seminar series, the incentives were apparently not sufficient to encourage staff to complete the research in a timely and professional manner. The lesson learned from the SERA capacity-building experience was that strong management support and leadership are needed for a capacity-building activity to be successful. The issue of compensation has often been cited as a reason for the lack of commitment of staff to learn and implement training. Staff seems to feel that they are entitled to compensation if they are to participate in training. Some organizations pay staff to attend training and some take participants offsite, which allows them to collect per diem and pocket the surplus. This is clearly an important issue, and one that requires an agreed approach.

VII. RECOMMENDATIONS FOR FUTURE INTERVENTIONS

The SERA Policy Project focused primarily on national policies affecting major food crops such as maize and rice and contributed to better understanding of these subsectors and to better policies. This effort was of two types: research to understand the impacts of policies and the performance of the subsectors, and rapid response analysis on important policy issues as they emerged. An example of the former was the large research effort that focused on the impacts of the maize export ban, and an example of the latter was the analysis of the impact of the duty-free rice imports in 2013. Both types of research are important, and there will be a continuing need for both. However, the SERA Policy Project has provided a solid foundation of research on important policy issues for maize and rice and that critical need has largely been met. Policies on other food crops such as oilseeds still need to be studied and research on policies for inputs such as fertilizer has not been undertaken. There is an ongoing need for policy analysis of emerging issues as they arise, and it is important to have the capability in place so issues can be analyzed quickly and correctly. This need cannot be met effectively by teams of short-term consultants organized for that purpose because such consultants rarely have the experience or analytical capability to respond quickly with quality analysis.

A high priority for future national policy research would be on other agricultural value chains such as traditional cash crops, livestock, and poultry, which were not part of the mandate for the SERA Policy Project. Traditional cash crops include cashews, coffee, cotton, tea, and tobacco, and these crops are losing share in the global market. Can improved policies reverse this trend? What are the appropriate marketing and trade policies for these cash crops? What will be the impact of the commodity exchange on marketing and producer's prices? How effective are government's efforts to promote domestic processing and what are the impacts on prices? Research on policies for these crops would lead to a better foundation on which to make policy decisions and better policies could improve the performance of these crops.

The livestock sector has great potential because of the abundance of land suitable for grazing in Tanzania, but the sector is unproductive and contributes little to incomes. The productivity of the livestock sector depends on improving the breed, controlling disease, and improving feed supplies. Research is needed on all aspects of these determinants of productivity. Initial research should begin by identifying the important problems of the livestock sector and then examining the policy framework. For example, what are the policies regarding the importing of vaccines to

control disease, the importing of improved breeds from neighboring countries or developed countries, the export of animal products such as meat or hides, or the policies for importing or manufacturing of feed additives and supplements? Research on these issues will lead to other policy questions and a project like SERA is needed to build a solid foundation of understanding of policy impacts for this important sector. The poultry sector will also become increasingly important as demand for poultry meat and eggs increases in the future. The sector comprises a commercial sector and a small-scale sector. The needs of these two value chains are very different, and policies appropriate for one may not be suitable for the other. Research is needed to identify the problems of each and examine policies to see if they are providing the right market incentives.

Strengthening the capacity for policy research in the MALF is a high priority, but not one that can easily be achieved through short-term capacity-building activities. The level of training and skills of staff of the Ministry is poor, and it is difficult to raise staff skills to the level required for policy analysis and research. A more effective approach would be to recruit new staff that have recently returned from foreign studies.

ANNEXES

- Annex 1: Quarterly Report, July – August 2016 (Year 5, Q4)
- Annex 2: PMP Indicators Modification
- Annex 3: Explanation for Indicator 4.5.2-36
- Annex 4: Study – Cross-Sectional Estimation of Food and Nutrient Demand in Tanzania
- Annex 5: Report – Rules-Based Transparent System for Emergency Food Imports
- Annex 6: Presentation – Rules-Based Transparent System for Emergency Food Imports
- Annex 7: Study – Establishment of the Agricultural Marketing Intelligence Unit (MIU) at MALF
- Annex 8: Course Outline – Training of Agricultural Commodity Market Analysis
- Annex 9: Study – Staple Food Market
- Annex 10: Training Plan - STATA
- Annex 11: Transition Letter – Secured Transactions-Collateral Registry
- Annex 12: Policy Brief – Effects of Gender on Maize Production and Marketing
- Annex 13: Policy Brief – Rules-Based Transparent System for Emergency Food Imports
- Annex 14: Policy Brief – Food Demand in Tanzania
- Annex 15: Policy Brief – Cross Border Transmission of Food Price Shocks
- Annex 16: Success Stories – Individual Capacity Building, Aneth Kayombo
- Annex 17: Success Stories – Zanzibar Food Basket Methodology
- Annex 18: Success Stories – Early Success of the RCT
- Annex 19: Success Stories – Annual Agricultural Conference
- Annex 20: Success Stories – FBM Mainland
- Annex 21: List of Deliverables

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**SERA Policy Project
Year 5, Quarter 4 Report
July – August 2016**

IMPLEMENTATION PROGRESS

The SERA Policy Project finalized several activities in the fourth quarter (Q4) of Year 5 (Y5), and will close the Project on August 30th. The activities included:

- finalizing the food demand study;
- presenting a workshop on the Rules-Based Transparent System for Emergency Food Imports;
- conducting a training on Commodity Market Analysis for staff of the Ministry of Agriculture, Livestock and Fisheries;
- completing a study of staple food crops;
- finalizing the feasibility study of the Market Intelligence Unit;
- sending a letter to the Bank of Tanzania to transition the collateral registry project to the World Bank;
- finalizing, printing, and distributing the Policy Briefs on i) Gender and Maize Production and Marketing, ii) Rules-Based Transparent System for Emergency Food Imports, iii) Food Demand, and iv) Cross-Border Transmission of Demand Shocks in Maize and Rice Markets to key stakeholders;
- conducting STATA software training; and
- hosting SERA farewell party on August 18th at Serena Hotel in Dar es Salaam, attended by 50 people.

COMPONENT I: POLICY RESEARCH AND REFORM

The SERA Project undertakes analysis and research on important policy issues in an effort to provide evidence-based analysis of policy impacts and provide policy options to government. Some of this research is conducted by SERA staff, and some is contracted to consultants. In all cases, high standards are sought. The SERA team is regularly invited to join policy discussions at an early stage to provide input on important policy issues and this has become an effective way to influence policies in the early development stages.

1. Intermediate Result 2: Binding Constraints to Private Sector Investment Reduced

The SERA Project works to expand markets through improved trade policies, improved market performance, and increased access to credit. Trade policy is an important component of economic policy and the economic environment. The SERA Project has previously focused on two important trade policy issues: the requirement of the Ministry of Agriculture, Food Security and Cooperatives (MAFC) / Ministry of Agriculture, Livestock and Fisheries (MALF) that traders obtain export and import permits from the GOT before undertaking trade, and the ad hoc approach of the GOT to emergency food imports that can disrupt markets and are vulnerable to rent seeking. The SERA Project also conducts research on the performance of the maize and rice markets, and

the impact of gender on maize marketing and production to provide a deeper understanding of these issues and provide support for policy reform recommendations. The proposal for a Transparent Rules-Based System for Emergency Food Imports, first proposed by SERA to the GOT in 2012, has gained strong support within the Government and is the main policy activity of SERA to Expand Markets and Trade. This effort will be combined with activities that support the proposed Market Intelligence Unit (MIU) in the Ministry of Agriculture, Livestock and Fisheries. Improved credit to smallholders and small and medium-sized enterprises (SME) has been a SERA priority since inception, but the BOT informed the SERA Project that it cannot adhere to the agreed timetable and no further support is planned. The activity will be transitioned to other development partners.

A. Transparent and Rules-Based Import/Export Permit Policy

In Year 4, the SERA Project presented a series of recommendations in the Policy Options for Food Security, Agricultural Growth and Poverty Alleviation (Policy Options Paper) for the establishment of a Transparent Rules-Based System for Emergency Food Imports. The final report was completed in Q3 and was presented to stakeholders in Q4. This activity will transition to Platform for Agricultural Policy Analysis and Coordination (PAPAC).

Policy Action Status:

- Stage 2: Stakeholder consultation/public debate.
SERA Project proposed recommendations for eliminating the permit systems in the Policy Options Paper presented to GOT at a workshop in February 2014. Since then, there has not been any progress in the status of the export permit policy. No further action has been requested or initiated by the GOT.

Tasks completed in Q4 of Y5:

- Presented stakeholders' workshop on proposed Transparent Rules-Based System for Emergency Food Imports on July 5th.
- Completed Policy Brief.
- Presented training on Commodity Market Analysis to staff of Market Intelligence Unit from July 12-15 in Bagamoyo in preparation for implementation of a Transparent Rules-Based System for Emergency Food Import System.

Milestones:

- Transparent Rules-Based System for Emergency Food Imports presented to GOT and other stakeholders (Q4).
- Implementation plan and capacity building action plan created (Q4).
- Capacity building provided (Q4).

Resources:

- SERA Policy Analyst
- SERA Senior Agriculture Policy Advisor
- SERA Senior Advisor
- Short term technical assistance (STTA) Economist Varun Kshirsagar.

Key Partners: Michigan State University (MSU), MALF.

Contribute to:

- Intermediate Result (IR) 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following process/steps of development as a result of United States Government (USG) assistance in each case: 1: Analysis -- 2: Stakeholder consultation/public debate -- 3: Drafting or revision -- 4: Approval (legislative or regulatory) -- 5: Full and effective implementation.
- Custom Indicator (CI) 4.1.1 Number of research outputs.

B. Credit to Smallholders and SMEs /Collateral Registry

Credit is essential to investments and delivering credit to small- and medium-scale enterprises and small farmers has been a challenge in Tanzania because of the lack of a legal framework governing lending for movable assets. Land cannot generally be used as collateral because all land is owned by the government. Moveable assets have not been used as collateral in Tanzania due to the weak legal structure and undeveloped registry to record liens against such assets. The SERA Project has worked to improve this situation by supporting the Bank of Tanzania to adopt and implement a modern secured transactions/collateral registry. The SERA Project collaborated with the World Bank on this important activity, with the World Bank providing financial support for the necessary computer equipment and software, and SERA providing policy support. Unfortunately, this activity cannot be completed due to internal delays at the Bank of Tanzania and the activity will be transitioned to the USAID-funded ENGINE Project.

Policy Action Status:

- Stage 1: Analysis.
The target policy action for Year 5 is *Stage 4, Approval (legislative or regulatory)*. In Year 3, SERA Project reported delays in attaining targets for this activity and the same delays remained in Year 5. Lack of progress on the draft, presentation, and adoption of the legislations has a direct impact on meeting *IR 4.5.2-30 Number of micro, small and medium enterprises (MSME) including farmers, receiving USG assistance to access loans*. This activity remains in Stage 1.

Tasks completed in Q4 of Y5:

- Submitted transition letter to BOT.
- Submitted deliverables to World Bank and local partners for activity transition.

Milestones:

- Legislation finalized (Q2).
- Stakeholder events held in support of the Legislation (Q2).
- Legislation presented in Parliament (Q3).

Resources:

- SERA Senior Agriculture Policy Advisor
- SERA Senior Advisor
- SERA Communications and Capacity Building Specialist
- STTA Legal Expert Dale Furnish
- M&N Law Associates (Advocates).

Key Partners: BOT, WB, MSU, Agriculture Non-State Actors Forum (ANSAF).

Contribute to:

- IR 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following process/steps of development as a result of USG assistance in each case: 1: Analysis -- 2: Stakeholder consultation/public debate -- 3: Drafting or revision -- 4: Approval (legislative or regulatory) -- 5: Full and effective implementation.
- IR 4.5.2-30 Number of MSMEs, including farmers, receiving USG assistance to access loans.

C. Improving Performance of Maize and Rice Market Prices

The SERA Project's research on maize and rice markets efficiency is comprised of two components. The first looked at the domestic and external drivers of maize prices and the report was completed in 2014. That study resulted in a Policy Brief that was disseminated in December 2014 at the 1st Annual Agricultural Policy Conference in Tanzania, and a research paper that was presented at the International Conference of Agricultural Economists in Milan, Italy in August 2015. The paper has been submitted for publication to the World Bank's Research journal. The second component of the study looks at the transmission of demand shocks in maize and rice markets and the effectiveness of trade policy to provide price incentives to farmers.

Policy Action Status:

- Stage 2: Stakeholder consultation/public debate.

Tasks completed in Q4 of Y5:

- Finalized study on Maize and Rice Market Efficiency and Transmission of Demand Shocks.
- Completed Policy Brief.

Milestones:

- Research results presented to stakeholders (Q3).

Resources:

- SERA Policy Analyst
- SERA Senior Advisor
- STTA Economist Varun Kshirsagar.

Key Partners: Not applicable (NA).

Contribute to:

- IR 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following process/steps of development as a result of USG assistance in each case: 1: Analysis -- 2: Stakeholder consultation/public debate -- 3: Drafting or revision -- 4: Approval (legislative or regulatory) -- 5: Full and effective implementation.
- CI 4.1.1 Number of research outputs.

2. Intermediate Result 2.2: Agricultural Productivity and Profitability Increased in Targeted Value Chains

An enabling environment is essential to a competitive agricultural sector led by the private-sector. The SERA Project completed numerous activities designed to improve the enabling environment, including reviewing food security policies, reviewing operations of the National Food Reserve Agency (NFRA), improving land policies, and improving the business environment and incentives. The reviews of food security policies and the NFRA are complete, the analysis of

the agricultural business environment and incentives is complete, and the study of land compensation and valuation is complete and has been disseminated to stakeholders. No further activities are planned.

A. Food Security

The SERA Project worked with the GOT to develop a more comprehensive food security policy, and presented a workshop in Y4 on Policy Options for Food Security, Agricultural Growth and Poverty Alleviation. This Policy Options Paper concluded our research efforts to provide mainland Tanzania with options for a more comprehensive food security policy. A Policy Brief on the Policy Options paper was completed in Y5-Q3. The policy recommendations presented to GOT are discussed further under ***Component II: Individual and Institutional Capacity Building***.

B. Food Demand

The SERA Project began research on food demand in Year 4. This study contributes to a better understanding of the current situation and future trends in food and nutritional demand. The information will be useful in directing resources, such as extension services and marketing, into the rapidly growing segments of food demand and also in guiding government and other stakeholder's interventions in promoting nutritional security in the country. Such information is essential to evidence-based policy decisions and strategic planning. The study uses data from the most recent household budget survey, and an academic expert was identified to provide guidance on the methodology and interpretation of the results. Expected outcomes of the study include:

- Estimates of price, income, and expenditure elasticities for different food groups,
- Estimates of nutrient demand,
- Comparisons of food demand patterns between rural and urban households,
- Identification of socio-economic characteristics that affect consumer food demand.

Policy Action Status: Stage 1: Analysis.

Tasks completed in Q4 of Y5:

- Completed the final estimation of food demand and include a nutrition analysis component.
- Completed the Policy Brief.

Milestones:

- Draft initial report (Q4).
- Complete and publish final report (Q4).

Resources:

- SERA Senior Advisor
- SERA Senior Agricultural Policy Advisor
- SERA Research Associate
- STTA Economist, Professor Chen Zhen.

Key Partners: iAGRI, MSU.

Contribute to:

- IR 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following process/steps of development as a result of USG assistance in each case: 1: Analysis -- 2: Stakeholder consultation/public debate -- 3: Drafting or revision -- 4: Approval (legislative or regulatory) -- 5: Full and effective implementation.
- CI 4.1.1 Number of research outputs.

COMPONENT II: INDIVIDUAL AND INSTITUTIONAL CAPACITY BUILDING

The SERA Project's approach to capacity building is twofold. The first approach focuses on institutional capacity building activities of selected organizations that can provide the greatest impact and support the development of an enabling policy environment. The second approach seeks to increase the capacity for research and evidenced-based policy analysis of individuals through training and support.

The SERA Project continued to focus its support on public sector institutions, providing institutional and individual capacity building to support the implementation of policy reforms. Public sector support was extended to include institutional training with the MAFC/MALF Department of Policy and Planning. Policy research activities have expanded opportunities to provide capacity building to individuals representing various GOT institutions through the development of local policy research teams. In addition, SERA Project provided strategic support to the Tanzania Agricultural Seed Traders Association (TASTA) and the Rice Council of Tanzania (RCT).

A. Ministry of Agriculture, Livestock and Fisheries, National Food Security Department

SERA Project continued to work with the USDA's Economic Research Service to support the adoption of the Food Basket Methodology (FBM) by the MAFC/MALF National Food Security Department (NFSD). The focus of activities was on the development and implementation of a Food Basket pilot program that would help ensure stakeholder ownership and long-term sustainability.

The Department of Policy and Planning (DPP) in MAFC/MALF expressed strong interest in the FBM and the implementation of recommendations from the Policy Options Paper. This led to the DPP submitting a proposal for a feasibility study for a Market Intelligence Unit, and training by SERA on the use of a Transparent Rules Based Emergency Import System. In addition, SERA Project completed a rapid assessment of Staple Crops in collaboration with the ASPIRES project.

i. Food Basket Methodology – NFSD

SERA Project and ERS of the USDA have provided support to the MAFC National Food Security Department for the development of a pilot activity that would provide insights on the feasibility of integrating Household Economy Analysis (HEA) data and retail prices collected at the district level in measuring food access using Food Basket Methodology. USDA ERS returned to Tanzania in August 2016 to meet with the new leadership in the NFSD and work with USAID on a transition plan for support.

Related Policy Action Status:

- Stage 2: Stakeholder consultation/public debate.
The target policy status for Year 5 is *Stage 5: Full and effective implementation*. This activity remains in Stage 2.

Tasks completed in Q4 of Y5:

- Transitioned activity to USDA.

Milestones:

- Pilot activity completed (Q3).

Resources:

- SERA Chief of Party
- SERA Senior Agricultural Policy Advisor
- SERA Communications and Capacity Building Specialist
- SERA Policy Analyst.

Key Partners: MALF Department of Food Security, USDA ERS.

Contribute to:

- IR 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following process/steps of development as a result of USG assistance in each case: 1: Analysis -- 2: Stakeholder consultation/public debate -- 3: Drafting or revision -- 4: Approval (legislative or regulatory) -- 5: Full and effective implementation.
- IR 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity or food security training.
- CI 4.2.1. Number of institutions receiving USG assistance.

B. Ministry of Agriculture, Livestock and Fisheries, Department of Policy and Planning**i. Market Intelligence Unit**

In Q4 of Year 4, the DPP requested support for a feasibility study on the creation of a Market Intelligence Unit. Diligent Consulting led this study, and in Y5-Q3 the team began interviews with stakeholders at the national and sub-national levels, including both public and private sector entities. Interviews were completed and the team developed a report outline covering five chapters:

1. Introduction: historical background, current agricultural MIS structure and functions, objective of the report, and methodology;
2. Situation Analysis of agricultural marketing information system in Tanzania;
3. Rationale and objectives of establishing an agricultural MIU;
4. Proposed establishment of MIU at MALF: introduction, mission, functions, institutionalization of price data collection in the existing agencies, organizational structure and staffing, capacity needs, legal framework, financing arrangement, expected outputs, and expected risks and challenges;
5. Pros and cons of an independent agency vs the MAFS housed version;
6. Work plan for period 2016/2017 – 2017, and an estimated budget for period 2016/2017 – 2017.

The report was scheduled to be presented at the monthly MALFD management meeting; however, due to time constraints this did not occur. The Final Report was given to the DPP in August 2016 for internal review and planning of next steps.

Related Policy Action Status: NA.

Tasks completed in Q4 of Y5:

- Final report delivered to MALFD.

Milestones:

- Study drafted (Q3, revised).
- Study presented to stakeholders (Q4, revised).

Resources:

- Diligent Consulting
- SERA Chief of Party (COP)
- SERA Senior Agricultural Policy Advisor.

Key Partners: MAFC, MSU, PAPAC.

Contributes to:

- IR 4.5.1-24 Number of agricultural and nutritional enabling environment policies completing the following processes/steps of development as a result of USG assistance in each case: State 1, Analysis; State 2, Stakeholder consultation/public debate; Stage 3, Drafting or revision; Stage 4, Approval (legislative or regulatory); Stage 5, Full and effective implementation.
- IR 4.5.2-7 Number of individuals who have received USG support short-term agricultural sector productivity of food security training.
- CI 4.2.1. Number of institutions receiving USG assistance.

ii. STATA Training

The SERA Project and ASPIRE Project sponsored a training on the use of STATA statistical software. STATA was selected as it is a commonly used statistical software package among researchers and policy analysts for data management, manipulation and statistical analysis, and is also used by the GOT and RGOZ. This training improved policy analysis capacities in the GOT, specifically, in MALF-PAPAC and Zanzibar Food Security and Nutrition Department (ZFSND). The objective of this activity was to provide participants with the skills and ability to use STATA statistical software packages to carry out in-depth research and policy analysis. ASPIRE provided the training materials and a lead trainer for the first session. SERA provided training assistants for the first session and later led the second training. The training assistants were selected from local training institutions, International Finance Management (IFM) and xxx (REPOA), to develop local training capacity. The training was provided to a total of 40 participants from eight institutions over two training sessions. 33% of the participants were women.

SERA Project submitted approval for a procurement action to purchase 40 Stata licenses for the training participants. Due to time constraints, SERA project was unable to complete this action.

Related Policy Action Status: NA.

Tasks NOT completed in Q4 of Y5:

- Purchase STATA licenses (Q4).

Milestones: NA**Resources:**

- SERA Communications and Capacity Building Specialist
- SERA Policy Analyst
- SERA Research Associate.

Key Partners: ASPIRE, IFM, and REPOA.**Contribute to:**

- IR 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity or food security training.
- CI 4.2.1. Number of institutions receiving USG assistance.

C. Strategic Support – Advocacy Organizations

Private sector organizations that are key stakeholders in policy reform activities are evaluated for strategic capacity building support in Year 5. Organizations identified for potential support include:

- **TASTA.** In Year 5, SERA continued to provide support to TASTA for stakeholder engagement and public-private sector dialogue with the GOT. SERA Project supported a one-day stakeholder workshop on March 11, 2016 in Arusha with 68 participants from the public and private sectors. The agenda included updates on public access to government seeds and issues related to seed packaging taxation. Also discussed was Maize Lethal Necrosis Disease (MLND), and mitigation efforts.
- **Rice Council of Tanzania.** The SERA Project continued to provide personnel support for policy analysis in Year 5. It is anticipated that the personnel support will be picked up as a direct cost under RCT at the conclusion of SERA Project.
- **Website Management Training.** The SERA Project organized a training to provide basic skills on website management to key public sector and private sector institutions. The purpose of this scope of work is to build capacity of public and private sector staff on website design, content management, and maintenance for effective food security information communication and dissemination. The training covered, but was not limited to, an overview of Joomla content management system, introduction to Content Management System, and article, menu and media management. Ten participants from the PAPAC, ZDFSN, RCT, and TASTA took part in the training. Documents for this activity were submitted in Q3 Y5.

Related Policy Action Status: NA.**Tasks completed in Q4 of Y5:**

- Complete Website training.

Milestones: NA.**Resources:**

- SERA Communications and Capacity Building Specialist
- SERA Senior Agricultural Policy Advisor.

Key Partners: TASTA, RCT.

Contribute to:

- IR 4.5.2-7 Number of individuals who have received USG support short-term agricultural sector productivity of food security training.
- CI 4.2.1 Number of institutions receiving USG assistance.

COMPONENT III: ADVOCACY AND COMMUNICATIONS

The SERA Project focuses on communication activities that support the policy research agenda and targets public sector institutions. The primary communication instruments are the SERA Project website, policy briefs, and public events such as conferences and stakeholder workshops.

A. SERA Website

The website is the main communications tool for SERA, making available evidence-based research and other key policy information. In August, SERA transitioned information and research to local partners. The Website will close August 30, 2016.

Related Policy Action Status: NA.

Tasks completed in Q4 of Y5:

- Transitioned information to local partners.

Milestones: NA.

Resources:

- SERA Communications and Capacity Building Specialist.

Key Partners: OMIS.

Contribute to:

- CI 4.1.3 Number of hits/visits to the SERA website.

B. Policy Briefs and Policy Research Briefs

Policy Briefs and Policy Research Briefs summarize specific research and policy recommendations on key issues affecting the agriculture sector. They are meant to inform decision makers and stakeholders.

Related Policy Action Status: NA.

Policy Briefs completed in Q4 of Y5:

- Gender in Maize Marketing and Production.
- Transparent Rules-Based System for Emergency Food Imports.
- Food Demand in Tanzania.
- Transmission of Demand Shocks and Implications for Trade Policy.

Milestones:

- Policy Options for Food Security, Agricultural Growth and Poverty Reduction (Q3).
- Agriculture Business Environment and Incentives (Q3).
- Gender in Maize Marketing and Production (Q4 *revised*).
- Drivers of Rice Prices (Q4 *revised*).
- Transparent Rules-Based System for Emergency Food Imports (Q4 *revised*).

- Demand for Food (Q4).

Resources:

- SERA Communications and Capacity Building Specialist
- SERA Policy Analyst
- SERA Senior Advisor.

Key Partners: iAGRI, MSU.

Contribute to:

- CI 4.1.2 Total number of SERA mentions in the press and social media.

C. Success Stories

In Q3 of Y5, success stories were drafted and outlined for the remaining time of the contract.

Related Policy Action Status: NA.

Tasks completed in Q4 of Y5:

- Finalized Evidence-based research to support policy: Lifting the maize export ban, updated 2016.
- Finalized FBM – Zanzibar: Design and implementation of the food basket methodology, including healthy food basket design.
- Finalized RCT story.
- Finalized Annual Agricultural Policy Conference story.
- Drafted and finalized FBM – Mainland: Design and implementation of a food basket methodology into the food security early warning system.

Tasks not completed for Q4 of Y5:

- Draft and finalize Rice (Trade Policy) – Transparent Rules-Based System for Emergency Food Imports.
- Draft and finalize TASTA story.

Milestones:

- Evidence-based research to support policy: Lifting the maize export ban (Q3).
- FBM – Zanzibar: Design and implementation of the food basket methodology, including healthy food basket design (Q3).
- FBM – Mainland: Design and implementation of a food basket methodology into the food security early warning system (Q4).
- Annual Agricultural Policy Conference (Q4).
- Rice – Transparent Rules-Based System for Emergency Food Imports, and the creation of the MIU to support further sustained engagement (Q4).
- The RCT Story (Q4).

Resources:

- SERA Staff
- SERA Senior Advisor.

Key Partners: MSU, PAPAC, RCT.

Contribute to:

- CI 4.1.2 Total number of SERA mentions in the press and social media.

PROJECT MANAGEMENT AND PERFORMANCE

1. Management

In Q4, SERA project submitted the Final Close-Out Plan to USAID for approval, closed all vendor accounts, disposed of all project assets and completed staff retrenchment.

MODIFICATION PMP Indicators

A. Introduction

The purpose of this modification to the SERA Policy Project PMP, is to address changes in the policy activities and align the PMP with revised indicator 4.5.1 (24). These changes will:

- Address the evolution and subsequent development of new policy activities that have resulted from SERA’s work program, and;
- Adjust the policy actions targets based on revised 2014 indicator definition.

B. Background

Feed the Future guidance for indicator 4.5.1 (24) has evolved over the SERA Project contract period, and changes to the SERA Project targets were first accommodated in the revised PMP of October 2013. The 2013 revisions addressed issues of the SERA Project Data Quality Analysis (DQA), changes in FTF indicator guidance, and the evolution of new policy activities.

At that time, the indicator definitions for 4.5.1 (24) did not account for the fluid and iterative policy process, and this seriously limited the accuracy of IP reporting. In addition, that process did not allow the SERA project to take on new policy actions that emerged and/or where requested by key stakeholders. The official FTF M&E reporting system, FTFMS, could also not accommodate the addition of new policies or accommodate double count that is part of the iterative policy process.

The Feed the Future guidance for 2014 included a revised and updated indicator 4.5.1 (24).

Changes to indicator 4.5.1 (24) recognized the fluid and changing nature of policy reform and the evolutionary process of research and policy dialogue and policy reform. The revised definition acknowledges and allowed double counting to more accurately reflect the policy process. The definitions of specific stages better met the realities of the policy formulation and reform process.

C. Summary of Revisions

2013 FTF Indicator 4.5.1 (24) Number of Policies/Regulations/Administrative Procedures in each of the following stages of development as a result of USG assistance in each case:

- Stage 1: Analyzed
- Stage 2: Drafted and presented for public / stakeholder consultation
- Stage 3: Presented for legislation / decree
- Stage 4: Passed / approved
- Stage 5: Passed for which implementation has begun (S)

Stages 1 and 2 = Output

Stages 3, 4, and 5 = Outcome

Revised 2014, Indicator 4.5.1 (24)

- Stage One - Analysis
- Stage Two - Stakeholder consultation / public debate
- Stage Three - Drafting or revision
- Stage Four - Approval (legislative or regulatory)
- Stage Five - Full and effective implementation

1. Export Ban. The GOT instituted an export ban on grain in 2011. The responsible authority for this administrative procedure is the Ministry of Agriculture, Livestock and Fisheries¹. The policy area for this activity is resilience and agricultural risk management policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

SERA Project led three research activities to provide the GOT with evidenced-based research on the following issues related to the Export Ban:

- Strengthening Tanzania's Safety Nets (USDA);
- Policy Options for Improving Tanzania Exports of Maize and Rice (AIRD);
- Economy Wide Impact of the Export Ban on Agricultural Growth and Household Welfare – Tanzania, 2012 (IFPRI).

The presentation of this research and analysis led to three new policy action areas for SERA: Food Security - FBM, NFRA analysis, and Export Permit System.

2. Food Security – MALF (Mainland). The USDA ERS followed their research on Strengthening Tanzania's Safety Nets, with an analysis of the feasibility of employing a Food Basket Methodology to increase the effectiveness of Tanzania's food security early warning systems. The responsible authority is the National Food Security Department in the then Ministry of Agriculture, Food Security, and Cooperatives (MAFC) and its successor, the Ministry of Agriculture, Livestock and Fisheries (MALF)², and the policy change is an administrative procedure. The policy area for this activity is resilience and agricultural risk management policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

The 2013 Feasibility study on the implementation of a FBM led to request for an assessment of the MUCHALI rapid assessment process and the application of the FBM.

3. NFRA Analysis. The 2012 SERA Project's presentation to GOT Stakeholders resulted in a request from the PMO to assess the role and function of the NFRA and investigate alternative safety-net models. This policy activity was conducted by AIRD under the USAID FTF NAFKA project. The responsible authority for changes to NFRA operations was/is the MAFC/MALF. NFRA is a semi-autonomous GOT Agency under the authority of the MAFC/MALF. The point of contact for this activity was the PMO. The policy area for this activity is resilience and agricultural risk management policy.

- **Life of Project Target:** Stage Four- Approval (legislative or regulatory)

¹ Formally the Ministry of Agriculture, Food Security and Cooperatives (MAFC). Changed in 2016.

4. Export Permits. The responsible authority for this administrative action is the MAFC/MALF, and its authority is derived from Cereals and Other Produce Act. The policy action for this activity is related to Agricultural Trade Policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

5. Seed Taxes - Mainland. The objective of this policy activity is to revise and reduce “tax” on seeds and seed packaging materials. This is a legal and regulatory change that occurs in the annual budget process, led by the MALF, approved and proposed by the MOF and passed by Parliament. The designated authority is the MOF. The policy area is Agricultural input policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

6. Seed Policy - Access. The objective of this policy action is to improve private sector access to protected government-developed seeds. The MAFC produced a Circular in 2011 that outlined the conditions for release of protected seed varieties produced in publicly supported Agricultural Research Institutions. However, the conditions were not favorable to the private sector and that discouraged the private sector from requesting the protected varieties. These are administrative and regulatory actions under the authority of the MAFC/MALF Plant Breeders Rights Registry. The policy area is Agricultural input policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

7. Seed Policy - ISTA and OCED. The objective of this policy is to comply with ISTA and OCED standards. This is a regulatory action within both the MAFC/MALF and the MANR and affects agricultural input policy and agricultural trade policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

8. Seed Policy - UPOV. The objective of this policy is for Tanzania to comply with UPOV standards and receive accreditation. This is a regulatory action within both the MAFC/MALF and the MANR and it affects agricultural input policy and agricultural trade policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

9. Collateral registry. The objective is to create a legal framework to support the use of movable assets as collateral by lenders and thereby improve access to credit for smallholders and SME’s. This requires the revision of the legal frameworks and parliamentary approval. The authority for this action is with the MOF, supported by the actions of the BOT. The Collateral Registry supports the enabling environment for private sector investments.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

10. Land Compensation and Benefits Sharing. The objective is provide information on various land compensation schemes as alternatives to land for equity approach. This is

regulatory action by the Ministry of Land and Human Settlements for the policy area: Land and natural resources tenure, rights and policy area.

- **Life of Project Target:** Stage 2 - Stakeholder consultation/public debate.

11. Business Environment. The objective of this activity is to present evidenced-based research to inform the GoT how Tanzania compares with other countries in the region on key factors influencing the business environment and investment incentives. It is anticipated that this work will address administrative procedures, regulatory frameworks and institutional arrangements. Given the diverse nature of the specific policy issues at this stage, PMO is the responsible authority. This work is in the enabling environment for private sector investment policy area.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

12. Improved Markets for Maize and Rice. The objective of this activity is to improve the efficiency of maize and rice markets by understanding the impact of policies on maize and rice price adjustments and regulations on exports and imports. It is anticipated that this work will address administrative procedures, regulatory frameworks and institutional arrangements. Given the diverse nature of the specific policy issues at this stage, PMO is the responsible authority. This works is in the Agricultural Trade Policy area.

- **Life of Project Target:** Stage 2 - Stakeholder consultation/public debate.

13. Transparent Rules-Based Import Policy. This policy action has evolved over time beginning with the objective of providing the GOT with evidenced-based research and analysis to address duty-free rice imports in 2012/2013. This was followed by providing the GOT with evidenced-based research and recommendation for the creation of a transparent rules-based import policy, specifically targeting rice. The final action was the recommendation to establish a Market Intelligence Unit to provide evidenced based research for a transparent rules-based emergency food import system.

This activity relates to administrative procedures and institutional arrangement and the responsible authority is the PMO for institutional issues and MAFC/MALF for agricultural policies and regulations. The policy area covered by this issue is institutional architecture for improved policy formulation.

- **Life of Project Target:** Stage 2 - Stakeholder consultation/public debate.

14. Food Security - Zanzibar. The objective of this activity is to improve the food security assessment systems of the Zanzibar National Food Security and Nutrition Department (FSND). It support the design and implement of a new food security assessment tool based on the food basket methodology. This is an administrative procedural change, with authority vested in the Director of the Food Security and Nutrition Department. The policy area is resilience and agricultural risk management policy.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

15. Zanzibar Rice Imports. The objective of this activity is to provide the RGOZ with evidenced-based research on the role of rice imports on Zanzibar’s food security. The activity policy area is resilience and agricultural risk management policy. Authority for changes to administrative procedures reside with the MANR, and trade issues are related to the Ministry of Trade.

- **Life of Project Target:** Stage 5 - Full and effective implementation.

16. Zanzibar Rice Production Profitability. The objective of this activity is to provide the USAID and the RGOZ with evidenced-based research on the feasibility of rain-fed and upland rice production and the potential of SRI technology. The activity policy area is resilience and agricultural risk management policy. Authority for changing administrative procedures resides with the MANR.

- **Life of Project Target:** Stage 2 - Stakeholder consultation/public debate.

17. Zanzibar Healthy Food Basket. The objective of this activity is to improve the food security assessment systems of the Zanzibar National Food Security and Nutrition Department (FSND) to include an assessment of the costs of a healthy food basket. This is an administrative procedural change, with authority vested in the Director of the Food Security and Nutrition Department. The policy area is resilience and agricultural risk management policy.

- **Life of Project Target:** Stage 2 - Stakeholder consultation/public debate.

Tanzania SERA Policy Project's Indicator's IR 4.5.2 - 36
August 3, 2016

The Tanzania SERA Policy Project's Indicator's IR 4.5.2 – 36 targets and actual results are shown in Table 1.

IR 4.5.2-36 is the value of exports of targeted agricultural commodities as a result of USG assistance. The target increase for IR 4.5.2 – 36 was 37.1% and the actual increase was 263.6%.

The exports of targeted commodities increased from USD72.8 million in 2010 to USD 237.8 million in 2015.

Table 1. Tanzania SERA Policy Project Indicators IR 4.5.2 - 36

IR 4.5.2-36	Value of exports of targeted commodities due to USG					
	2010	2011	2012	2013	2014	2015
Maize Base (Million USD)	20.82			22.84	25.40	28.54
Maize Target (%)				9.7	22.0	37.1
Maize Actual (Million USD)	20.82	39.02	40.15	213.86	96.15	130.58
Maize Actual (%)				927	362	527
Share of Exports Due to USG (%)				50	50	50
Maize Due to USG (USD)				96.52	37.66	54.88
Maize Due to USG (%)				463.6	180.9	263.6
Rice Base	51.96					
Rice Target (%)				0	0	0
Rice Actual (usd)	51.96	101.00	172.03	147.86	115.16	107.69
Rice Actual (%)				184.55	121.62	107.25
Share of Exports Due to USG (%)				0	0	0
Maize and Rice Base (USD)	72.78					
Maize and Rice Actual (USD)		140.02	212.18	361.72	211.30	238.27
Maize and Rice Actual (%)		92.38	191.52	396.99	190.33	227.37

Narrative

The actual increase in indicator IR 4.5.2 –36 exceeded the targeted increase by substantial margins for several reasons including the policy reforms implemented by the Government of the United Republic of Tanzania in response to research provided by the SERA Policy Project. However, it is difficult to attribute the proportion which was due directly to policy reforms and the proportion due to other factors. One of the important factors contributing to the increase in the value of trade in targeted commodities was the increase in prices of maize and rice during the period. The substantial increase from 2010 to 2013 (Table 2) provided improved incentives for farmers and helped to produce surpluses that were available for export. These increases would probably not have occurred if not for the lifting of the export ban in 2012

and the commitment of the Government to encourage exports and allow producers to benefit from higher prices in the regional market. This reversed the previous practice of the Government of discouraging exports when prices rose in response to increased regional demand. For example, the Government imposed five export bans from 2005 to 2011, but none since 2012. Prices were allowed to increase substantially in 2012 and 2013 and exports were encouraged. This contributed to the rapid increase in production and exports of maize and rice. Other factors also contributed to the increase in production including the efforts of the Tanzania Feed the Future Initiative to improve production practices and infrastructure. While it is not possible to attribute the proportion of the increase in exports from 2010 to 2015 exclusively to the SERA Policy Project it is likely that the policy reforms undertaken by the Government in response to SERA Policy research were an important factor.

Table 2. Prices of Maize and Rice (USD/ton)		
	Maize	Rice
2010	233	723
2011	262	836
2012	337	1053
2013	359	911
2014	269	795
2015	274	825

**SERA Policy Project's Estimation of Targeted Indicators IR 4.5.2 - 35, 36
June 10, 2013**

IR 4.5.2-35 is the percent change in the value of regional trade in targeted commodities.

Note: Includes trade only within the region but more than is USG attributable.

IR 4.5.2-36 is the value of exports of targeted agricultural commodities as a result of USG assistance.

Note: Exports are counted against the baseline of exports of targeted commodities in calendar year 2010.

Baseline and Targets

IR 4.5.2-35	Baseline 2010 (mil USD)	Targets (percent)	2013	2014	2015
	64.28		7%	15%	20%
IR 4.5.2-36	Baseline 2010, Maize (mil USD)	Targets (mil USD)	2013	2014	2015
	20.82 ¹		2.03	4.59	7.73
	Baseline 2010, Rice (mil USD)	Targets (mil USD)	2013	2014	2015
	37.05		0.00	0.00	0.00

Justification

Baseline Estimates: The SERA Policy Project contract was awarded in April 2011 and the base year is taken to be calendar year 2010.

Note: Monthly data is not available to allow calculation of trade on a fiscal or crop year basis.

Target Commodities: Maize and Rice

Target Region: The region for IR 4.5.2-35 is taken to mean the eight countries with land borders to Tanzania (Kenya, Uganda, Rwanda, Burundi, DRC, Zambia, Malawi, and Mozambique), and trade includes both Tanzania mainland and Zanzibar.

Targets for Indicators: Targets are required for each Indicator for years 2013-2015.

Units of Measure: Values measured in USD converted from local currency when necessary using monthly exchange rates obtained from the IMF's International Financial Statistics and the Bank of Tanzania Monthly Economic Review.

Data Requirements: Data to measure the value and volume of regional and extra-regional trade should come from Tanzanian customs records. However, that data is incomplete and inaccurate. For example, for 2011, Stryker and Amin (2012) estimated actual maize exports through Tanzanian customs border crossings were 95,089 tons while Tanzanian customs reported 2,873 tons exported. Imports are equally

¹ The baseline value of maize exports in 2010 was from USDA data instead of WITS because it was more consistent with other information on maize exports such as Stryker (2012) and Martin (2012). The comparable number from WITS was 12.1 million USD.

unreliable according to local traders who report large imports of rice that pass through the Dar port without being recorded or paying import duties. A possible solution to the problem of under reporting of trade by customs is to use mirror trade data which looks at what other countries report as trade with Tanzania. This data is also incomplete but provides a more realistic estimate of trade. Data from World Integrated Trade Solutions (WITS) was used for the annual estimates of import and export values and volumes.

Reported Data for IR 4.5.2-35: the percent change in the value of regional trade in targeted commodities. Note: Includes trade only within the region but more than USG attributable.

Based on the World Integrated Trade Solutions (WITS) <http://wits.worldbank.org/wits/> the values and volumes of trade of targeted commodities (maize and rice) for the baseline calendar year 2010 are:

Baseline Data for Calendar Year 2010.							
Maize Volumes (tons)			Maize Values (USD)			Unit Values	
Exports	Import	Trade	Exports	Import	Trade (USD)		
20,232	1,963	22,195	12,101,000	213,300	12,314,300	554.82	
Rice Volumes (tons)			Rice Values (USD)				
Exports	Import	Trade	Exports	Import	Trade (USD)		
15,101	43,752.00	58,853	37,052,000	14,910,000	51,962,000	882.91	
Total Trade (USD)					\$ 64,276,300		

Targets for 2013-2015 compared to 2010

2013 = 7%, 2014 = 15%, 2015 = 20%

Estimating USG Attribution: IR 4.5.2-36 requires estimation of the increase in the value of exports of target commodities attributable to USG activities relative to the baseline values of 2010. The SERA project was credited with convincing the GoT to lift the export ban on maize² and the impact of that policy changes is estimated for 2013-2015 in the following spreadsheet. No impact on exports of rice is attributable to USG activities.

The methodology for estimating the impact of lifting the maize export ban was based on field research during 2012 which showed that lifting the maize export ban increased farm gate prices of farmers in the Southern Highlands by as much as 100 percent. However, the price impact depends on the market conditions and in 2012 there was a drought in Kenya that caused export prices to rise sharply. For 2013-2015 a price increase of 25 percent was assumed for maize producers in the Southern Highlands. This would cause producers to increase production (supply elasticity assumed to equal 0.2) and a portion of that production would be exported. The resulting increase in export volumes is shown and the value of

² Prime Minister Pinda, September 7, 2012.

the increased exports are obtained from projecting nominal USD monthly prices using a linear trend through 2015.

IR 4.5.2-36 Value of Exports of Maize as result of USG Activities											
Production											
	Trend	Trend	Southern Highlands-----				Total Production-----			Increased Production	
	Maize	Production	Price	Supply	Growth	Share of	Other	Southern	Total	Due to USG	
	Production	% Increase	Increase	Response	Rate	National	Areas	Highlands	(mil tons)	(000 tons)	(%)
						Production	(mil tons)	(mil tons)	(mil tons)		
2010	4.4										
2011	4.6	4.8			4.00	50	2.300	2.300	4.600	0.0	0.0
2012	4.8	4.6			4.57		2.405	2.405	4.810	0.0	0.0
2013	5.0	4.2	25.0	0.200	9.16		2.505	2.625	5.130	120.3	2.4
2014	5.2	4.2	25.0	0.200	9.19		2.610	2.867	5.477	256.6	4.9
2015	5.4	3.8	25.0	0.200	8.83		2.710	3.120	5.830	409.7	7.6
Exports											
		Exports	Share of	Exports	Maize	Maize	IR 4.5.2-36	Percent			
	Trend	Share of	Increased	Increase	Export	Export	Increased	Increase			
	Exports	Production	Production	due to USG	Price	Values	Value of	in Value			
	(000 tons)	(%)	Exported (%)	(000 tons)	(USD/ton)	(mil USD)	Maize	of Maize			
							Exports	Exports			
							due to USG	due to USG			
							(mil USD)	(%)			
2010	75.00	1.71		0.0	277.6	20.82		0.0			
2011	78.66	1.71		0.0	297.6	23.41		0.0			
2012	82.25	1.71		-	317.6	26.12	0.0	0.0			
2013	85.67	1.71	5	6.0	337.6	28.92	2.0	9.7			
2014	89.26	1.71	5	12.8	357.5	31.91	4.6	22.0			
2015	92.68	1.71	5	20.5	377.5	34.99	7.7	37.1			
Assumes											
Maize exports in 2010 were 75,000 tons based on USDA data as reported by Martin in Ahmed (2012)											
Trend Production Growth in 2012 is about 4% per year											
Maize farmers in southern highlands receive 25% higher prices during 2012-2016											
Supply elasticity to the higher prices is .20											
Production in the southern highlands grows by (.25*.20) faster (about 8%)											
That 50% of production is in the southern highlands											
That 5% of increased production is exported											
USD maize export prices grow along historical trends											
Arusha maize wholesale price is the export price											
Summary											
Maize Production Increase in 2015 (tons)				409,710							
Maize Exports 2015 (tons)				113,168							
Maize Export Increase in 2015 (tons)				20,486							
Maize Export Value Increase in 2016 (USD)				7,733,280							
Maize export Values (USD)				34,987,455							

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Cross-Sectional Estimation of Food and Nutrient Demand in Tanzania Using a Large Demand System

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Abstract

In this study, we estimate a two-way Exact Affine Stone Index demand system with 18 food groups and a *numéraire* good using a large cross-section household survey in Tanzania. We accounted for censored demand, price and expenditure endogeneity, and the dimensionality issue associated with any large demand system. We found demand for most food groups is own-price and total expenditure elastic. Households with lower total expenditures appear to be more price and expenditure elastic than their well-off counterparts. Calorie and nutrient consumption is positively associated with total expenditure, although price increase in one food group does not necessarily lead to reduced calorie and nutrient consumption due to substitution toward other foods.

JEL classification: D12, O12

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Introduction

Recent years have seen substantial advances in the estimation of food demand. This advancement is attributed to the evolution in empirical frameworks that enables estimation of consumer demand using cross sectional data. Historically, consumer demand studies relied solely on time series data, mainly because cross sectional surveys were rare and there was a belief that true price variations do not exist in cross sectional data, because of the law of one price, which made them unsuitable for demand estimation (Deaton 1988). Cox and Wohlgenant (1986) and Deaton (1988) were some of the early research that examined the existence of spatial price variation in cross sectional data and managed to obtain consistent demand parameter estimates. Advancement in microeconomic techniques has been particularly beneficial to developing countries, where there is limited time series data but a growing pool of publicly available cross-sectional datasets. Moreover, because of trade barriers and poor transportation infrastructure, the observed spatial differences in prices in developing countries are more likely to be caused by supply-side factors than their developed counterparts. This feature in price formation is important because identification of the demand curves relies on price variations caused by supply shocks.

In this study, we estimate a large demand system consisting of 18 food groups and a *numéraire* good using a large cross-sectional survey of close to 10,000 Tanzanian households. We contribute to the literature in three ways. First, we address the econometric complications of censored demand, price and expenditure endogeneity, and curse of dimensionality associated with large demand systems in a unified framework. Although previous work has applied these techniques in the U.S. (e.g., Zhen et al. 2014), this appears to be the first time that all these issues are addressed simultaneously in a developing country context. Second, we estimated a utility-theoretic demand model that allows even the Hicksian price elasticities to be different between households at different total expenditure levels. This extra flexibility in functional form can be especially useful for developing countries because, with foods being necessities, demand patterns may be quite distinct between households of different income levels. Third, to our knowledge, this is the largest food demand system ever estimated for Tanzania. The resulting expenditure quartile-specific elasticities can be used by policymakers to simulate the effects of price and income enhancement policy proposals on food and nutrient consumption.

Past Literature

Weliwita, Nyange, and Tsujii (2003) and Abdulai and Aubert (2004) are some of the early studies in Tanzania that used cross-sectional data sets to estimate price and expenditure elasticities for groups of food items. Weliwita et al. (2003) used the 1991/92 household budget survey data set collected by the National Bureau of Statistics and estimated a censored demand model using the linearized Almost Ideal Demand (AID) system (Deaton and Muellbauer 1980). The study reported price and expenditure elasticities for a group of 12 food items. However, the authors did not account for price and expenditure endogeneity biases. Abdulai and Aubert (2004) used data from a primary survey of 500 households conducted in two regions (Dar es Salaam and Mbeya) and estimated food and nutrient elasticities for 6 food groups with the Quadratic AID

(Banks, Blundell, and Lewbel 1997). The two authors did not account for censored demand, nor did they address potential price endogeneity.

Model

We characterize Tanzania household food preferences in an EASI demand system with 18 food-at-home (FAH) categories and a composite *numéraire* good that include all other consumption goods and services. We choose the EASI functional form as opposed to the popular AID model and its variants for three *a priori* reasons.¹ First, like the AID model, EASI has an approximate version that is linear in parameters conditional on real total expenditures. This allows accounting for censored demand in estimation. Without this property, it would have been extremely difficult econometrically to estimate a nonlinear demand functional form with censored data. Second, the EASI model allows the Engel curves to take any shape as determined by data. This feature can be especially important in the development context because, with foods being necessities, their expenditure elasticities may change as income improves. By contrast, the most an AID model can accommodate is demand quadratic in total real expenditures (Banks et al. 1997). Third, the two-way EASI model allows Hicksian demand to change with total expenditures in a utility-theoretic fashion by interacting log prices with real total expenditures. Hence, the EASI functional form could be consistent with extremely flexible price effects in the data. The AID models only allow Marshallian demand to vary with income through the income effect in the Slutsky equation.

The two-way approximate EASI demand system is specified as

$$(1) \quad w_{hi}^* = \sum_{j=1}^J a_{ij} \ln p_{hj} + \sum_{j=1}^J a_{ijy} y_h \ln p_{hj} + \sum_{r=1}^L b_{ir} y_h^r + \sum_{k=1}^K v_{ik} z_{hk} + u_{hi}, \quad h = 1, \dots, H; \quad i = 1, \dots, J-1;$$

where w_{hi}^* is the latent budget share on the i th category for household h , p_{hj} is the price index for household h and category j , J is the number of demand categories and equals 19 (18 FAH categories plus a *numéraire*), y_h is the real total household expenditure, L is the highest degree of total expenditure polynomial to be determined by statistical tests, the z_{hk} 's are K exogenous demand shifters including a constant, the a_{ij} , a_{ijy} , b_{ir} , and v_{ik} terms are parameters, and u_{hi} is the regression residual. Following Lewbel and Pendakur (2009), we construct y_h as the Stone price-deflated total household expenditure: $\ln x_h - \sum_{j=1}^J w_{hj} \ln p_{hj}$, where x_h is nominal total household expenditures on food and other goods and services. Because of censoring, the latent share w_{hi}^* is related to observed budget share w_{hi} according to $w_{hi} \equiv \max\{0, w_{hi}^*\}$
 $w_{hit} \equiv \max\{0, w_{hit}^*\}$, where w_{hit} is calculated as category-level expenditure divided by total expenditures.

Censored Demand System Estimation with Endogenous Regressors

This section provides an overview of the econometric techniques used to handle several potential model and data complications. Detailed discussion on variable creation is deferred to the “Data

and Empirical Specifications” section. We follow the vast literature on censored demand (Perali and Chavas 2000; Meyerhoefer, Ranney, and Sahn 2005; Kasteridis, Yen, and Fang 2011) to use the Tobit model to characterize censoring. The Tobit model is less structural than the virtual price approach to censored demand. However, the latter approach is computationally infeasible for large systems because of multiple integrals of the large number of censored demand regimes. Also, the virtual price approach appears to only work with the translog demand (Christensen, Jorgenson, and Lau 1975), which has a less flexible functional form than EASI. Finally, it is not clear how the virtual price approach would account for endogeneity in the explanatory variables, which may be a serious issue in micro data.

There are three sources of endogeneity in the demand equation (1) with one being less important than the other two. First, $\ln x_h$ is deflated by a Stone price index, which introduces budget shares into log real total expenditure y_h . This form of endogeneity is easily corrected by using \bar{w}_j to instrument w_{hj} in y_h and has been found to have little impact empirically in the Canadian and U.S. contexts (Lewbel and Pendakur 2009; Zhen et al. 2014). Second, by being a household decision variable, total household expenditure is most likely endogenous with category demand. This simultaneity can have serious adverse effects on estimation (LaFrance 1991). To reduce this bias, we use household income data to construct an instrument for $\ln x_h$. It is worth noting that the demand equation (1) is conditional on total household expenditures, rather than the group expenditure on food as is common in food demand studies.² While total expenditure is arguably less endogenous with food demand than total food expenditure is, it may still be necessary to control for expenditure simultaneity provided that instrumental variables are available.

The third form of endogeneity is concerned with prices and unit values calculated as expenditure divided by physical quantity. Although use of micro data largely rules out demand-supply simultaneity common in aggregate data, product quality and price search could cause unit values and prices paid to be endogenously determined with demand, respectively. Unit values contain information on market prices *and* quality. If one uses unit values without accounting for quality to estimate demand, the results will be biased (Cox and Wohlgenant 1986; Deaton 1988). However, controlling for quality alone may not be sufficient if households who search for lower prices are different, in unobserved (to the econometrician) ways, from those who do not use or use this strategy to a lesser extent. This correlation between household cost minimization behavior and unobserved household heterogeneity could cause biased estimates if unaccounted for.

We use the extended Amemiya’s generalized least squares (AGLS) estimator developed by Zhen et al. (2014) to estimate the Tobit demand system (1) while controlling for price and expenditure endogeneity. The extended AGLS estimator builds on the standard AGLS estimator for single-equation limited dependent variable models and extends it to the context of a system of limited dependent variable equations. The estimator works in three steps. In the first step, reduced-form Tobit regressions are estimated equation-by-equation, where censored budget shares are the dependent variables. The explanatory variables are the exogenous demand shifters,

instrumental variables, and residuals from least squares auxiliary regressions of endogenous total expenditures and prices on all exogenous variables and instruments. The second step recovers the structural parameters of the budget share equations (1) using minimum distance (Wooldridge 2002, p. 444) and constructs the correct asymptotic covariance matrix for the structural parameters, which accounts for the correlation between the Tobit equations and between the Tobit equations and the linear auxiliary regressions. In the third step, the minimum distance estimator is applied again to impose the utility-theoretic restrictions of homogeneity ($\sum_j a_{ij} = 0$ and $\sum_j a_{jy} = 0 \quad \forall i$) and symmetry ($a_{ij} = a_{ji}$ and $a_{iyy} = a_{jyy}$) on the latent demand. The three-step extended AGLS estimator is efficient among a class of limited information estimators (Newey 1987). In comparison with full information maximum likelihood estimators that estimate all Tobit equations simultaneously (e.g., Dong, Gould, and Kaiser 2004), the extended AGLS is more feasible for estimating large demand systems, especially when some explanatory variables may be endogenous.

Data and Empirical Specification

Data for our analysis is obtained from the Household Budget Survey (HBS) conducted between Oct 2011 and Oct 2012 by Tanzania National Bureau of Statistics (NBS) in collaboration with the World Bank and other Development Partners. The survey collects data on household consumption, expenditure, income and demographic characteristics. A total of 10,186 households were interviewed during the survey of which 9,735 reported data on food consumption. The Sampling frame for HBS 2011/12 was based on the Tanzania Population and Housing Census (PHC) of 2002. First stage primary sampling units were the enumeration areas (EAs). PHC 2002 had a total of 52,375 EAs including 33,947 rural EAs and 18,428 urban EAs. Each EA had 133 households on average. Rural EAs on average had more households than urban EAs (155 vs. 94). A stratified multi-stage sampling design was used to sample the households. 24 households were selected from each EA, where 2 households were surveyed each month for 12 months. Food consumption was captured through daily food transactions that were recorded in a diary for a period of one month, the transactions included food purchases, own production and food received as gifts. Data for the 18 food groups presented in our study were aggregated from total of 184 food items (i.e., COICOP codes). We dropped households that reported more than one-month of consumption and purchase diaries. Our final analysis sample contains 9,936 households. On average, total per capita expenditure on foods and all other consumption goods and services was 54.9 thousand TSh per month during 2011–12, 25.8 thousand TSh of which were spent on the 18 food groups that we estimated in the demand system. These 18 food groups account for the vast majority of FAH spending.

Data on nutrient composition for food items was obtained by linking Classification of Individual Consumption by Purpose (COICOP) codes for food items in HBS 2011/12 with nutrient composition tables provided by Lukmanji et al. (2008). The tables provide a comprehensive nutrient composition on 47 nutrients for over 400 commonly consumed food items and dishes in Tanzania. Food items that were not on the Tanzania nutritional table were obtained from the U.S. Department of Agriculture Food Composition Database.

Table 1 reports average budget shares, per capita consumption quality, unit value, and per capita calorie consumption by food group and per capita total expenditure quartile. Households in the bottom expenditure quartile spent 73% of their total expenditures on FAH, while households in the top expenditure quartile expended 33% of their budget on these foods. There also appears to be differences in food preferences as total expenditure increases. At the lowest expenditure quartile, maize accounts for the largest budget share at 22.9%, while rice is the dominant food group in terms of budget share for households in the top quartile. Maize and cassava provided the most calories to households at the bottom quartile, while households at the top quartile obtained the most calories from rice and maize. The unit value, defined as food group expenditure divided by quantity, increases with total expenditures for all food groups except fats and oils, sugar, and soft drink and juice. This is in line with U.S. findings (Leibtag and Kaufman 2003) and suggests well-off households choosing more expensive but higher quality foods.

The last column of table 1 illustrates the proportion of observations that are censored at zero. Other meat and egg are the two food groups that had the highest degree of censoring at 87%. Vegetable had the lowest percentage of censored observations with only 3% of households not reporting consumption in their diaries. To facilitate interpretation of the calorie and nutrient elasticities later in the study, we present average calorie and nutrient density for 11 nutrients by food group in table 2. These are weighted values using the quantity share of individual food items within food group as weights.

Expenditure Instrument

To create the instrument for total household expenditure, we regress total expenditure on a number of income and asset variables. The explanatory variables include average monthly income from real estate and durable good sales (SALE) in the last 12 months; amount of last employment-related and in-kind cash payment received (LABOUR); total income received by a business in the last 30 days (BIZ); monthly average income transfers from neighbors, relatives, government and non-government organizations in the past 12 months (WAGE); average monthly income received from renting a plot of land in the past 12 months (LAND); average monthly income from crop sales in the past 12 months (CROP); average monthly income from sale of processed agricultural products and by-products in the past 12 months (AGRO); average monthly income from sale of livestock and livestock by-products in the past 12 months (LIV, LIV2 & LIV_PR); average monthly income earned from providing agricultural services in the past 12 months (SERV); and average monthly income from investment and selling of agricultural assets in the past 12 months (ASSET). In addition, we included quadratic and cubic terms of total income calculated as the sum of all above incomes, household size, regional dummies, and ward type dummies. These regressors are significantly correlated with total expenditures, producing an adjusted R2 of 0.41.

Price Indexes and Instruments

We address the unit value bias and potential biases from consumer cost minimization behavior in two ways. First, we construct household Fisher Ideal price indexes at the food category level

using COICOP-level unit values as elements. Specifically, the Fisher Ideal price index for household h , FAH category j ($j = 1, \dots, J - 1$) is calculated as

$$(2) \quad p_{hj} = \sqrt{\frac{\sum p_{kht} q_{k0}}{\sum p_{k0} q_{k0}} \frac{\sum p_{kht} q_{kht}}{\sum p_{k0} q_{kht}}}$$

where p_{kht} and q_{kht} are the unit value and physical quantity (in kilogram or litre) of the k th COICOP code in category j in week t , respectively, and p_{k0} and q_{k0} are the base weekly unit value and quantity of k . We set the base at the sample mean. The COICOP-level unit values are missing if the household did not consume the product. We imputed the missing unit values using predicted unit values produced from a regression of reported unit values on COICOP dummies, week dummies, cluster dummies, the interactions between COICOP and week dummies, between COICOP and regional dummies, between COICOP and ward type dummies, between week and regional dummies, and between week and ward type dummies.

The Fisher Ideal price index is superlative in that it is consistent with a second-order approximation to an arbitrary twice-continuously differentiable linear homogenous consumer cost function. Therefore, compared with using category-level unit values as the price variables for equations (1), the Fisher Ideal index reduces the part of unit value bias due to within-category substitutions. However, to the extent that the Fisher Ideal price index uses COICOP code-level unit values as its elements, it is still subject to the unit value bias. To create an instrument for the Fisher Ideal price index, we calculate 1) the cluster-level mean price index, and 2) the weighted mean price index using data from households (donors) in the same region excluding the household (target) being instrumented. The weight is the number of survey days that overlapped between the donor households and the target households. We regress p_{hj} on the cluster mean and weighted regional mean price indexes. The predicted price \hat{p}_{hj} from this regression is used as the instrument for p_{hj} . Because not all households in a cluster were surveyed in the same period, the weighted mean regional Fisher Ideal index provides valuable information about market price variations independent from that from cluster-level means. Identification of the price coefficients relies on the spatial and temporal variations in market prices (Deaton 1988; Beatty 2010).

The price index $p_{h,j}$ for the *numéraire* good is the share-weighted average of the Fisher Ideal price index for food away from home (FAFH) and the consumer price index (CPI) less food and nonalcoholic beverages. Similarly, the instrument for the *numéraire* good is the share-weighted average of FAFH instrument and CPI lagged by two months. The FAFH instrument is created in the same way as FAH instruments.

Exogenous Demand Shifters

To control for observed taste differences across households, we include a total sixteen demand shifters including a constant as the z_{hk} variables in equations (1). These are log household head age, log household size, a marital status dummy (married vs. all other), and two household head

education dummies (primary and secondary). We also include a variable for the fraction of the household reporting period that overlapped with Christmas–New Year (Dec 25, 2011–Jan 1, 2012), Easter week (Apr 8–14, 2012), or Eid al-Fitr (Aug 18–19, 2012). Finally, we include nine variables for the proportion of household members within each of the ten gender-specific age groups: 0–14, 15–29, 30–44, 45–64, and 65+, with the female 65+ age group set as the reference group.

Empirical Results

We estimate the system of $J - 1$ Tobit equations (1) using the extended AGLS. The parameters of the budget share equation for the *numéraire* good, which is not censored, are recovered post-estimation using the homogeneity, symmetry, and adding-up restrictions on the latent demand. We determined that the proper degree of polynomial on real total household expenditure is $L = 2$ by increasing the value of L sequentially and testing the joint significance of the b_{iL} ($i = 1, \dots, J - 1$) coefficients by minimum distance. While conducting this test, we did not impose the homogeneity and symmetry conditions on the demand system. Otherwise, the test would have become a joint test of the b_{iL} and these economic restrictions. Under the null that y_h^L can be excluded from the demand system, the test statistic is asymptotically distributed as $\chi^2(J - 1)$. When $L = 2$, the test statistic is 53.4, with a p-value < 0.000 . At $L = 3$, the test failed to reject the null that the cubic real expenditure term can be excluded from the system (p-value = 0.648).

We also tested for the joint significance of the coefficients a_{ijy} on the interaction between log price and real income. Without imposing the symmetry and homogeneity conditions, the test produced a test statistic of 1400.8 with 342 degrees of freedom (p-value < 0.000). This reinforces the superiority of the two-way EASI model over other conventional demand systems by allowing the Hicksian demand to vary with total expenditures.

Price Elasticities

Tables 3a–d present the median Marshallian elasticities by per capita total expenditure quartile. For households at the first (lowest), second, and third quartiles of per capita expenditures, all own-price elasticities are statistically significant at the 5% level at the median of the sample.³ For households at the fourth (highest) quartile, 16 out of 19 own-price elasticities are statistically significant at the 5% level. Comparing own-price elasticities across quartiles, demand becomes less price-elastic for all but fish and seafood and all other goods as total expenditure increases. This is consistent with the intuition that as income rises, consumers become less sensitive to food price changes. The largest reductions in the magnitude of own-price elasticities from the lowest to highest quartile are observed for maize (–0.90 to –0.43), red meat (–0.76 to –0.14), vegetable (–1.42 to –0.69), and pulses (–1.46 to –0.74). For maize and red meat, the own-price elasticities for the top quartile are not statistically significant, while they are statistically significant for the other three expenditure quartiles.

Demand for fish and seafood by households in the highest expenditure quartile is substantially more elastic (–2.09) than households in the lowest expenditure quartile (–1.26).

This result is not implausible. Households at the top quartile consumed more than twice as much fish and seafood as those at the bottom quartile, 1.25 vs. 0.53 kg/person-month. It is possible that, at high levels of consumption, an additional unit of fish and seafood is more dispensable because of satiety, which would lead to higher price elasticities at the margin.

Among the cross-price elasticity pairs that are statistically significant and large, rice and maize, rice and wheat and other cereals, rice and other meat, fruit and roots and tubers, egg and red meat, red meat and coffee tea and cocoa, and red meat and soft drink and juice are estimated to be substitutes; rice and red meat, maize and red meat, red meat and dairy, red meat and vegetable, and fruit and egg are estimated to be complements. In some cases, the estimated cross-price relations are consistent with *a priori* expectations (e.g., maize and rice); in other cases, we do not have a strong expectation for a complementary or substitutive relationship (e.g., red meat and soft drink and juice).

Expenditure Elasticities

The last columns of tables 3a–d provide total expenditure elasticities by food group and expenditure quartile. Unlike previous studies of Tanzanian food demand conditional on food expenditures (Abdulai and Aubert 2004; Weliwita et al. 2003), these elasticities are with respect to changes in total expenditures on food and all other consumption goods and services. It is arguable that total expenditure elasticities are much less susceptible to the endogeneity bias than food expenditure elasticities, and that the former are more policy-relevant metrics.

The expenditure elasticities are positive for most of the food groups and expenditure quartiles, suggesting foods are normal goods for much of the total expenditure range. The expenditure elasticities are negative for maize and vegetable at the top quartile, for other meat and pulses at all four quartiles, and for soft drink and juice at the bottom two quartiles. As negative expenditure elasticities means demand drops when total expenditure increases, these results point to these foods being inferior goods at the margin at these expenditure quartiles. However, none of the negative expenditure elasticities are estimated to be statistically significant.

At the lowest quartile, expenditure elasticities for 9 out of 18 food groups are statistically significant. The eight food groups are maize, cassava, poultry, fish and seafood, dairy, fruit, vegetable, sugar, and coffee, tea and cocoa. By contrast, at the top quartile, expenditure elasticities for maize, cassava, vegetable, and sugar are no longer statistically significant at the conventional levels, while red meat and egg are more precisely estimated. Maize, cassava and vegetable have some of the lowest unit values among the 18 food groups, and red meat and egg are among the food groups with higher unit values. These results are consistent with the intuition that demand for higher-valued (lower-valued) foods increases (decreases) as the household becomes well-off.

Nutrient Elasticities

We follow Huang (1996) and Huang and Lin (2000) to use price and expenditure elasticities to back out the calorie and nutrient elasticities (see the appendix for derivations of these nutrient

elasticities). Tables 4a–d present the calorie and nutrient price and expenditure elasticities. The nutrient price elasticity π_{kj} measures the percent change in consumption of nutrient k with respect to a 1% change in the price of the j th good. For example, table 4a indicates that the elasticity of protein with respect to fish and seafood price is -0.18 for the bottom expenditure quartile and statistically significant at the 1% level. This means FAH protein consumption will decrease by 1.8% if the price of fish and seafood increases by 10%.

A nutrient expenditure elasticity ρ_k , presented in the last columns of tables 4a–d, measures the percent change in the consumption of nutrient k with respect to a 1% change in total expenditures. For example, the calorie elasticity is estimated to be 0.79 for the lowest expenditure quartile and statistically significant at the 1% level. This indicates that when total expenditure increases by 10%, consumption of calorie from FAH sources increases by 7.9%.

In general, the estimated nutrient price elasticities are small in magnitude and, in many cases, not statistically significant at the conventional levels. An increase in the price of one food group does not necessarily reduce overall nutrient consumption. This is because even though nutrients from the food group that experienced the price increase must decrease by law of demand, nutrients from substitute food groups will increase because of substitution effects. In fact, overall nutrient consumption could potentially increase if the degree of substitution is sufficiently large and the substitute food groups have higher nutrient density. For example, according to table 4a, the elasticity of iron consumption with respect to rice price is 0.35 (t-value = 4.34)—a 10% increase in rice price increases total iron consumption by 3.5%. This is partly driven by substitutions toward maize and pulses, and that maize and pulses are more iron-dense than rice (table 2).

All calorie and nutrient expenditure elasticities are positive across expenditure quartiles and many are statistically significant. Therefore, calorie and the 11 nutrients are normal goods for Tanzanian consumers. The magnitude of the expenditure elasticities for calorie and 9 of the 11 nutrients declines as total expenditure increases. This is similar to trends observed for total expenditure elasticities for food groups in tables 3a–d and consistent with *a priori* expectations for calorie and nutrients that are necessities.

Conclusion

In this paper, we developed a model of FAH consumption in Tanzania based on the two-way EASI demand system of Lewbel and Pendakur (2009). Using household food consumption data from a cross-section of 9,936 households from the HBS 2011/12, we estimated the demand system with 18 FAH groups and a *numéraire* good for all other consumption goods and services. We used a variety of econometric techniques to address the issues of censored demand, price and total expenditure endogeneity, and curse of dimensionality in large nonlinear demand systems. To our knowledge, this is so far the largest food demand system ever estimated for Tanzania; and no other study has addressed all econometric issues above in a unified framework as this study did in the development context.

The empirical results show that demand for most foods is price elastic at all expenditure levels. Hence, price policies could be effective in changing the level of consumption for targeted food groups, especially for households with lower total expenditures. This is an intuitive result as low-resource households are more willing to substitute to reduce the overall cost of food. Households are estimated to be responsive to total expenditure changes as indicated by the mostly positive and large expenditure elasticities. However, unlike the own-price elasticities that are largely statistically significant, a number of the expenditure elasticities are not precisely estimated. Consequently, if one is to use the expenditure elasticities to predict effects of income growth on food demand, the predicted values will have large prediction intervals for certain food groups.

In addition to price and expenditure elasticities by total expenditure quartile, we also calculated nutrient price and expenditure elasticities for calorie and 11 key nutrients at different levels of total expenditures. These nutrient elasticities quantify the variations in calorie and nutrient consumption from FAH as food group prices and total expenditure change. An important result from the nutrient analysis is that total calorie and nutrient consumption do not have to decline when the price of one food group increases. In fact, a price increase may increase FAH calorie and nutrient consumption if there are sizable substitution effects and the substitute food groups are more calorie and nutrient-dense than the food group that experiences the price hike. The effects of an increase in total expenditure on calorie and nutrient consumption are positive and, in many situations, large in magnitude. Overall, calorie and nutrient consumption by low-resource households is more elastic with respect to total expenditure changes than well-off households.

For practical purposes, we have employed the extended AGLS estimator to estimate parameters of the large censored demand system. The AGLS estimator is efficient in a class of limited information estimators (Newey 1987). Efficiency had not been a first-order concern in other applications of the estimator using scanner data from the United States, where the sample size easily surpasses one hundred thousand observations (e.g., Zhen et al. 2014). However, as is evident in the lack of statistical significance for a number of the cross-price and expenditure elasticities in tables 3a–d, it will be valuable in future work to develop alternative practical estimators that are more efficient and able to handle endogeneity and a large number of goods. To our knowledge, this estimator does not currently exist.

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Table 1. Summary statistics by per capita total expenditure quartile																						
Food group	Average budget share					Average quantity ^a					Average unit value ^b					Average energy ^c					% obs censored	
	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4	3.00	Q1	Q2	Q3	Q4	1.839	Q1	Q2	Q3	Q4	10776		
1. Rice	0.051	0.069	0.072	0.047	0.66	1.49	2.40	3.00	1.772	1.787	1.784	1.839	2369	5370	8612	10776	24%					
2. Maize	0.229	0.180	0.114	0.044	5.52	7.06	6.96	4.91	0.912	0.942	0.948	0.974	20074	25673	25283	17827	8%					
3. Cassava	0.051	0.033	0.018	0.007	1.91	2.09	1.65	1.07	0.636	0.686	0.812	0.997	5334	5636	4208	2602	54%					
4. Wheat & oth cereals	0.031	0.024	0.027	0.017	0.66	0.70	1.13	1.33	2.141	2.133	2.227	2.260	2208	2299	3682	4263	37%					
5. Red meat	0.027	0.035	0.045	0.034	0.16	0.32	0.60	0.90	4.158	4.300	4.505	4.720	417	870	1599	2405	37%					
6. Poultry	0.007	0.007	0.009	0.006	0.04	0.07	0.12	0.15	4.025	4.299	4.696	5.017	88	141	242	302	81%					
7. Fish & seafood	0.055	0.050	0.044	0.030	0.53	0.79	0.97	1.25	3.483	3.746	3.801	4.006	767	1182	1552	1993	11%					
8. Oth meat	0.004	0.004	0.004	0.003	0.03	0.05	0.06	0.10	3.048	3.410	3.669	4.439	107	174	240	298	87%					
9. Dairy	0.017	0.019	0.018	0.011	0.49	0.90	1.29	1.67	0.854	0.928	1.055	1.380	298	548	781	1033	65%					
10. Fats & oils	0.030	0.031	0.029	0.019	0.20	0.33	0.63	0.62	4.262	4.208	4.171	4.156	1754	2866	5521	5414	8%					
11. Fruit	0.019	0.021	0.022	0.013	0.48	0.91	1.34	1.59	1.348	1.363	1.384	1.471	682	1208	1626	1671	29%					
12. Vegetable	0.083	0.074	0.061	0.036	1.93	2.90	3.53	3.72	1.069	1.079	1.150	1.262	700	941	1047	1147	3%					
13. Pulses	0.049	0.038	0.032	0.016	0.78	1.02	1.30	1.12	1.403	1.433	1.501	1.627	1520	2192	2942	2808	10%					
14. Roots & tubers	0.050	0.055	0.048	0.022	2.17	3.67	4.82	3.68	0.667	0.714	0.788	0.907	1961	3366	4648	3554	29%					
15. Sugar	0.017	0.020	0.021	0.012	0.18	0.35	0.57	0.63	2.568	2.601	2.474	2.345	684	1367	2217	2455	31%					
16. Egg	0.001	0.001	0.001	0.002	0.00	0.01	0.02	0.05	4.258	4.360	4.314	4.410	6	16	32	82	87%					
17. Coffee, tea, & cocoa	0.003	0.003	0.004	0.002	0.01	0.02	0.04	0.06	10.355	10.728	11.338	11.765	4	6	8	11	46%					
18. Soft drink & juice	0.002	0.003	0.005	0.004	0.03	0.10	0.22	0.51	2.233	1.733	1.779	1.497	7	21	48	91	75%					
19. All other goods	0.274	0.331	0.426	0.675																		

Note: ^aper capita quantity per month; soft drink and juice measured in liter; coffee, tea, and cocoa measured by a combination of kilogram and liter; all other food groups measured in kilogram. ^bunit value is measured in thousand Tanzania shillings per kilogram or liter. ^cdietary energy is measured in per capita kcal per month. Q1–Q4 represent first (bottom) through fourth (top) per capita total expenditure quartiles, respectively. Survey weights applied. Red meat includes beef and lamb. Other meat includes pork, wild, and processed meats.

Table 2. Energy and nutrient density per kilogram (liter) of food (beverage)												
Food group	Energy (kcal)	Protein (g)	Vitamine A (µg RE)	Vitamine C (mg)	Vitamine D (µg)	Vitamine B12 (µg)	Iron (mg)	Calcium (mg)	Phosphorus (mg)	Potassium (mg)	Saturated fat (g)	Unsaturated fat (g)
1. Rice	3,595	65	0	0	0	0	6	80	1,034	813	1	3
2. Maize	3,635	81	0	0	0	0	35	60	2,420	2,882	5	25
3. Cassava	2,245	19	64	420	0	0	10	285	857	4,015	1	2
4. Wheat & oth cereals	3,257	82	10	0	0	0	13	267	993	968	43	17
5. Red meat	2,676	182	344	0	0	18	12	32	1,435	2,478	101	96
6. Poultry	2,040	187	275	0	0	2	10	91	1,266	1,288	38	82
7. Fish & seafood	1,633	274	204	41	62	28	10	3,492	4,009	4,676	20	24
8. Oth meat	3,786	202	7	6	7	5	7	232	1,771	2,033	123	180
9. Dairy	644	35	311	2	0	4	1	1,240	986	1,537	21	11
10. Fats & oils	8,682	1	50	0	0	0	1	54	35	27	694	251
11. Fruit	1,915	66	113	137	0	0	14	309	1,043	3,085	40	99
12. Vegetable	306	30	1,353	227	0	0	11	440	410	2,435	0	1
13. Pulses	2,264	173	15	36	0	0	57	780	2,713	7,193	7	32
14. Roots & tubbers	873	14	4,225	138	0	0	11	151	354	3,677	0	1
15. Sugar	3,905	3	4	3	0	0	3	38	96	266	9	6
16. Egg	1,552	126	1,692	0	10	11	12	501	1,722	1,261	33	55
17. Coffee, tea, & cocoa	52	1	2	0	0	0	0	35	40	515	0	0
18. Soft drink & juice	259	0	0	0	0	0	0	145	64	5	0	0

Note: RE = Retinol Equivalent

Table 3a. Price and expenditure elasticities at the first (bottom) expenditure quartile																				
Elasticity of demand for	With respect to price of																		Expenditure elasticity	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19
1. Rice	-1.88	1.54	-0.31	0.46	-0.78	0.07	-0.02	0.75	-0.37	-0.09	0.08	0.39	0.10	0.36	-0.20	0.03	-0.10	0.09	-0.40	0.33
	(-3.23)	(3.12)	(-0.77)	(2.43)	(-2.77)	(0.47)	(-0.03)	(3.07)	(-1.47)	(-0.93)	(0.88)	(1.96)	(0.75)	(1.43)	(-0.90)	(0.75)	(-1.46)	(1.00)	(-0.50)	(0.68)
2. Maize	0.57	-0.90	0.19	0.14	-0.04	-0.17	0.01	-0.07	-0.02	0.06	0.06	-0.16	0.17	0.03	-0.05	-0.04	0.02	0.02	-0.24	0.50
	(3.92)	(-7.17)	(2.57)	(2.45)	(-1.02)	(-2.80)	(0.18)	(-1.26)	(-0.26)	(2.83)	(2.37)	(-2.37)	(3.34)	(0.45)	(-0.75)	(-1.86)	(1.53)	(0.93)	(-1.23)	(3.96)
3. Cassava	-0.54	0.25	-1.34	-0.30	0.35	0.23	-0.36	-0.08	0.66	0.08	-0.11	0.03	0.15	-0.60	0.16	0.04	0.02	0.15	-1.37	2.51
	(-1.25)	(0.41)	(-2.65)	(-1.11)	(1.60)	(1.03)	(-1.59)	(-0.67)	(1.66)	(0.90)	(-1.39)	(0.09)	(0.87)	(-1.46)	(0.57)	(0.95)	(0.11)	(1.32)	(-1.25)	(1.91)
4. Wheat & oth cereals	0.74	0.62	-0.30	-1.86	0.17	0.29	-0.11	-0.22	-0.26	0.08	-0.09	0.28	0.05	0.22	0.04	0.03	-0.04	-0.23	0.14	0.56
	(2.29)	(1.93)	(-0.82)	(-5.63)	(1.74)	(1.98)	(-1.01)	(-1.40)	(-1.33)	(1.55)	(-1.34)	(1.76)	(0.56)	(1.34)	(0.41)	(0.85)	(-0.89)	(-2.15)	(0.44)	(0.41)
5. Red meat	-1.27	-0.06	0.53	0.18	-0.76	0.18	-0.16	0.18	-0.50	-0.03	0.12	0.66	0.12	-0.12	0.12	0.24	0.26	0.05	0.16	0.11
	(-3.38)	(-0.08)	(2.81)	(2.04)	(-5.38)	(1.78)	(-1.36)	(1.87)	(-3.11)	(-0.55)	(1.86)	(3.84)	(1.51)	(-0.61)	(1.26)	(4.51)	(4.68)	(0.94)	(0.30)	(0.61)
6. Poultry	0.07	-1.61	0.45	0.42	0.24	-2.02	0.21	0.16	0.54	0.08	-0.04	-0.63	0.05	0.03	0.18	0.09	0.01	0.08	-1.04	2.57
	(0.04)	(-3.06)	(0.82)	(1.91)	(1.18)	(-6.81)	(0.74)	(0.76)	(1.67)	(0.66)	(-0.57)	(-2.30)	(0.11)	(-0.11)	(0.67)	(0.99)	(0.08)	(0.47)	(-1.08)	(2.85)
7. Fish & seafood	-0.08	-0.09	-0.30	-0.12	-0.18	0.15	-1.26	0.30	0.21	-0.06	0.14	0.13	-0.10	-0.23	0.00	0.05	0.03	0.01	0.25	1.12
	(-0.28)	(-0.55)	(-1.55)	(-1.37)	(-1.75)	(1.09)	(-7.29)	(2.76)	(1.73)	(-1.47)	(2.27)	(1.09)	(-0.89)	(-1.36)	(-0.02)	(0.99)	(0.71)	(0.09)	(0.65)	(2.84)
8. Oth meat	2.72	-0.14	-0.11	-0.37	0.44	0.22	0.86	-4.03	0.31	0.36	0.07	-0.50	0.13	-1.16	0.51	0.03	0.06	0.14	1.86	-1.31
	(3.12)	(-0.10)	(0.10)	(-1.10)	(1.85)	(0.87)	(2.35)	(-4.16)	(1.14)	(2.79)	(0.44)	(-1.04)	(0.86)	(-2.03)	(1.69)	(0.50)	(0.78)	(1.17)	(1.49)	(-1.08)
9. Dairy	-0.65	-0.22	0.87	-0.28	-0.54	0.35	0.24	0.13	-2.44	-0.19	0.14	-0.09	0.00	0.23	-0.30	-0.02	-0.13	0.15	1.37	1.34
	(-1.82)	(-0.83)	(2.18)	(-1.57)	(-2.88)	(1.87)	(1.54)	(0.83)	(-6.31)	(-2.49)	(1.58)	(-0.53)	(-0.23)	(0.71)	(-1.97)	(-0.50)	(-2.25)	(1.29)	(1.70)	(2.29)
10. Fats & oils	-0.20	0.46	0.26	0.12	-0.06	0.11	-0.05	0.19	-0.23	-1.03	0.22	-0.05	0.01	-0.08	0.13	0.01	0.09	0.02	0.00	0.10
	(-1.05)	(3.67)	(3.38)	(1.82)	(-0.76)	(1.93)	(-0.87)	(3.39)	(-2.65)	(-28.74)	(5.13)	(-0.48)	(0.42)	(-0.90)	(2.30)	(0.37)	(3.46)	(0.87)	(-0.03)	(1.72)
11. Fruit	0.12	0.22	-0.17	-0.19	0.15	0.00	0.24	0.01	0.22	0.21	-2.27	-0.27	-0.03	0.31	0.03	-0.23	0.16	-0.09	-0.07	1.61
	(0.46)	(1.00)	(-1.61)	(-2.09)	(1.36)	(-0.20)	(2.14)	(0.05)	(1.73)	(3.77)	(-11.36)	(-2.32)	(-0.33)	(2.33)	(-0.07)	(-4.42)	(3.50)	(-1.74)	(-0.24)	(4.49)
12. Vegetable	0.36	-0.46	0.13	0.16	0.37	-0.17	0.12	-0.20	-0.03	-0.04	-0.07	-1.42	0.08	0.07	-0.05	0.08	-0.04	0.00	0.57	0.60
	(1.94)	(-2.22)	(1.23)	(1.91)	(3.24)	(-1.90)	(1.42)	(-2.06)	(-0.11)	(-1.19)	(-1.59)	(-9.77)	(1.17)	(0.54)	(-0.43)	(2.08)	(-1.24)	(0.04)	(1.45)	(3.00)
13. Pulses	0.19	0.88	0.33	0.06	0.11	0.08	-0.05	0.01	0.03	0.01	0.02	0.20	-1.46	-0.22	0.16	-0.08	-0.01	0.23	-0.34	-0.10
	(0.86)	(3.88)	(2.99)	(0.51)	(1.44)	(0.99)	(-0.34)	(0.25)	(0.54)	(0.46)	(0.69)	(1.72)	(-10.36)	(-1.43)	(1.77)	(-1.68)	(0.08)	(3.94)	(-0.99)	(0.98)
14. Roots & tubers	0.43	0.24	-0.40	0.17	-0.08	0.05	-0.12	-0.41	0.18	-0.02	0.17	0.13	-0.14	-1.90	0.20	-0.05	0.02	-0.09	1.76	-0.01
	(1.55)	(1.02)	(-0.98)	(1.33)	(-0.63)	(0.60)	(-0.85)	(-2.36)	(1.07)	(-0.35)	(2.37)	(0.99)	(-1.00)	(-4.84)	(1.50)	(-1.24)	(0.61)	(-0.93)	(2.76)	(-0.16)
15. Sugar	-0.74	-0.84	0.36	0.00	0.13	0.23	-0.09	0.38	-0.54	0.08	0.01	-0.30	0.16	0.38	-1.30	0.04	-0.25	0.17	-0.55	2.65
	(-1.30)	(-1.59)	(0.58)	(-0.09)	(0.47)	(0.95)	(-0.37)	(1.35)	(-1.66)	(0.52)	(-0.17)	(-1.18)	(0.49)	(0.64)	(-4.98)	(0.55)	(-1.87)	(1.05)	(-0.67)	(2.16)
16. Egg	0.45	-1.24	0.50	0.27	2.02	0.48	0.55	0.13	-0.17	0.06	-1.18	1.12	-0.67	-0.58	0.19	-1.31	-0.50	-0.32	-0.38	0.50
	(0.80)	(-1.51)	(1.10)	(0.87)	(4.84)	(1.04)	(1.05)	(0.49)	(-0.39)	(0.41)	(-4.46)	(2.35)	(-1.43)	(-1.24)	(0.62)	(-4.83)	(-2.67)	(-1.12)	(-0.27)	(0.49)
17. Coffee, tea, & cocoa	-1.26	0.09	0.10	-0.37	1.62	0.06	0.10	0.15	-0.86	0.30	0.61	-0.65	-0.18	0.03	-0.94	-0.39	-2.23	0.07	0.13	3.30
	(-1.72)	(0.04)	(-0.01)	(-1.28)	(3.00)	(0.26)	(0.42)	(0.47)	(-2.17)	(1.76)	(2.37)	(-1.80)	(-0.92)	(-0.25)	(-2.34)	(-2.26)	(-6.71)	(0.19)	(-0.13)	(2.49)
18. Soft drink & juice	0.65	0.67	0.75	-0.77	0.22	0.20	0.11	0.25	0.58	0.09	-0.16	0.13	0.90	-0.42	0.39	-0.13	0.05	-2.46	-0.29	-0.59
	(1.11)	(1.32)	(2.13)	(-2.36)	(1.00)	(0.75)	(0.44)	(1.17)	(1.42)	(1.22)	(-1.13)	(0.45)	(3.25)	(-0.75)	(1.62)	(-1.09)	(0.69)	(-6.39)	(-0.30)	(-0.33)
19. All other goods	-0.16	-0.31	-0.15	-0.03	-0.03	-0.03	0.00	0.06	0.14	-0.04	-0.01	0.02	-0.11	0.20	-0.02	-0.01	0.01	-0.02	-1.22	1.59
	(-0.82)	(-0.91)	(-0.78)	(-0.11)	(-0.26)	(-0.17)	(0.03)	(0.26)	(0.87)	(-1.06)	(-0.09)	(0.05)	(-1.47)	(0.91)	(-0.21)	(-0.16)	(0.13)	(-0.14)	(-2.41)	(3.21)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All elasticities are median values. Median t-values reported in parentheses.

Table 3b. Price and expenditure elasticities at the second expenditure quartile

Elasticity of demand for	With respect to price of																			Expenditure elasticity
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Rice	-1.70	1.27	-0.32	0.48	-0.69	0.03	-0.01	0.62	-0.19	-0.06	0.06	0.25	0.08	0.38	-0.22	-0.03	-0.11	0.08	-0.24	0.37
	(-3.19)	(2.92)	(-0.87)	(2.80)	(-2.99)	(0.37)	(0.01)	(3.04)	(-0.91)	(-0.89)	(0.88)	(1.74)	(0.72)	(1.60)	(-1.13)	(-0.76)	(-1.70)	(0.97)	(-0.37)	(0.48)
2. Maize	0.60	-0.81	0.18	0.08	-0.15	-0.20	0.07	-0.06	-0.05	0.02	0.04	-0.16	0.11	0.04	-0.06	-0.05	0.03	0.01	0.08	0.37
	(3.55)	(-5.70)	(2.39)	(1.62)	(-3.10)	(-2.61)	(1.51)	(-1.03)	(-0.60)	(1.11)	(1.89)	(-2.17)	(2.50)	(0.39)	(-0.76)	(-2.08)	(1.55)	(0.74)	(0.33)	(2.40)
3. Cassava	-0.53	0.27	-1.19	-0.24	0.22	0.18	-0.30	-0.16	0.59	0.08	-0.12	0.09	0.13	-0.49	0.21	0.03	0.04	0.11	-1.06	2.02
	(-1.34)	(0.51)	(-3.08)	(-1.03)	(1.41)	(0.90)	(-1.55)	(-0.93)	(1.60)	(1.19)	(-1.50)	(0.41)	(1.05)	(-1.38)	(0.76)	(0.87)	(0.39)	(1.22)	(-1.19)	(2.04)
4. Wheat & oth cereals	0.78	0.26	-0.24	-1.73	0.22	0.27	-0.15	0.00	-0.12	0.05	0.00	0.29	0.02	0.12	0.06	0.01	-0.04	-0.22	-0.18	0.66
	(2.58)	(1.30)	(-0.65)	(-5.73)	(2.26)	(2.00)	(-1.38)	(-0.08)	(-0.72)	(1.42)	(0.20)	(1.89)	(0.32)	(1.04)	(0.66)	(0.35)	(-0.86)	(-2.32)	(-0.40)	(0.47)
5. Red meat	-1.06	-0.44	0.32	0.22	-0.52	0.04	-0.10	0.15	-0.34	0.04	0.08	0.45	0.16	0.02	0.11	0.28	0.23	0.12	-0.08	0.32
	(-3.69)	(-2.67)	(2.39)	(2.79)	(-3.40)	(0.84)	(-1.05)	(1.96)	(-2.77)	(1.33)	(1.73)	(3.57)	(2.12)	(0.25)	(1.38)	(5.36)	(4.74)	(2.45)	(-0.28)	(0.80)
6. Poultry	-0.03	-1.34	0.32	0.38	0.01	-1.87	0.05	0.10	0.54	0.04	-0.05	-0.33	0.02	-0.14	0.17	0.04	0.05	0.02	-0.72	2.47
	(-0.16)	(-3.08)	(0.39)	(2.04)	(0.10)	(-7.36)	(0.12)	(0.62)	(1.77)	(0.64)	(-0.78)	(-1.95)	(0.13)	(-0.58)	(0.60)	(0.66)	(0.50)	(0.06)	(-1.03)	(3.41)
7. Fish & seafood	-0.06	0.08	-0.27	-0.15	-0.12	0.07	-1.48	0.25	0.31	-0.01	0.08	0.11	0.04	-0.19	0.02	0.04	0.03	0.02	0.16	1.05
	(-0.24)	(0.56)	(-1.52)	(-1.70)	(-1.59)	(0.74)	(-8.61)	(2.59)	(2.42)	(-0.40)	(1.84)	(1.05)	(0.75)	(-1.32)	(0.26)	(0.93)	(0.74)	(0.46)	(0.44)	(2.94)
8. Oth meat	2.15	-0.11	-0.32	0.06	0.39	0.14	0.64	-3.30	0.38	0.30	0.03	-0.29	-0.05	-1.01	0.47	0.04	0.02	-0.01	1.31	-0.76
	(2.98)	(0.01)	(-0.19)	(0.19)	(1.87)	(0.82)	(2.25)	(-4.26)	(1.37)	(2.74)	(0.37)	(-0.67)	(-0.30)	(-2.15)	(1.75)	(0.56)	(0.69)	(0.02)	(1.42)	(-0.89)
9. Dairy	-0.36	-0.28	0.72	-0.14	-0.40	0.36	0.33	0.16	-2.32	-0.12	0.18	0.01	-0.08	-0.01	-0.23	0.00	-0.11	0.01	0.77	1.37
	(-1.36)	(-1.16)	(1.95)	(-1.06)	(-2.74)	(2.01)	(2.16)	(1.30)	(-6.84)	(-2.34)	(2.34)	(0.00)	(-1.09)	(-0.09)	(-1.93)	(-0.08)	(-2.31)	(0.08)	(1.08)	(2.68)
10. Fats & oils	-0.13	0.16	0.23	0.10	0.07	0.09	0.03	0.19	-0.15	-0.98	0.24	-0.09	0.02	-0.06	0.03	0.06	0.06	0.06	0.06	0.13
	(-0.87)	(1.90)	(3.21)	(1.74)	(1.30)	(1.88)	(0.79)	(3.57)	(-1.74)	(-25.60)	(5.33)	(-1.25)	(0.63)	(-0.84)	(1.47)	(2.68)	(3.09)	(2.27)	(0.20)	(0.74)
11. Fruit	0.10	0.08	-0.19	-0.03	0.10	-0.02	0.13	-0.01	0.30	0.22	-2.05	-0.09	0.04	0.22	0.13	-0.26	0.16	-0.12	-0.12	1.35
	(0.52)	(0.38)	(-1.79)	(-0.44)	(1.26)	(-0.44)	(1.66)	(-0.15)	(2.73)	(4.19)	(-12.73)	(-1.36)	(0.68)	(2.02)	(1.38)	(-5.09)	(3.61)	(-2.21)	(-0.34)	(4.65)
12. Vegetable	0.28	-0.38	0.15	0.20	0.32	-0.09	0.11	-0.14	0.04	-0.05	-0.02	-1.21	0.04	-0.03	0.01	0.06	0.00	-0.07	0.42	0.47
	(1.74)	(-2.14)	(1.30)	(2.18)	(2.88)	(-1.19)	(1.42)	(-1.68)	(0.63)	(-1.73)	(-0.38)	(-8.54)	(0.59)	(-0.29)	(0.52)	(1.86)	(0.07)	(-1.41)	(1.07)	(2.12)
13. Pulses	0.20	0.55	0.29	0.04	0.21	0.07	0.12	-0.07	-0.05	0.03	0.07	0.11	-1.24	-0.12	0.09	-0.02	0.03	0.22	-0.21	-0.17
	(0.78)	(2.97)	(2.79)	(0.35)	(2.25)	(0.94)	(1.60)	(-0.88)	(-0.19)	(0.74)	(1.46)	(1.23)	(-8.77)	(-0.98)	(1.51)	(-0.46)	(1.46)	(3.71)	(-0.52)	(-0.17)
14. Roots & tubers	0.44	0.16	-0.33	0.10	0.03	-0.01	-0.09	-0.36	0.03	-0.02	0.13	0.01	-0.07	-1.71	0.08	-0.03	-0.01	-0.01	1.72	0.13
	(1.68)	(0.83)	(-0.67)	(1.12)	(0.21)	(0.17)	(-0.76)	(-2.33)	(0.47)	(-0.48)	(2.14)	(0.28)	(-0.86)	(-4.64)	(1.11)	(-0.98)	(0.23)	(-0.04)	(2.80)	(-0.18)
15. Sugar	-0.76	-0.66	0.47	0.06	0.15	0.23	-0.01	0.37	-0.41	-0.02	0.14	-0.07	0.05	0.09	-1.21	0.04	-0.19	0.09	-0.54	2.14
	(-1.38)	(-1.54)	(0.77)	(0.42)	(0.85)	(0.98)	(-0.10)	(1.45)	(-1.54)	(-0.36)	(1.04)	(-0.53)	(0.33)	(0.19)	(-6.50)	(0.59)	(-1.85)	(0.85)	(-0.71)	(2.40)
16. Egg	-0.39	-1.43	0.34	0.08	2.33	0.20	0.34	0.15	0.02	0.30	-1.30	0.67	-0.15	-0.32	0.19	-1.22	-0.25	-0.31	-0.13	0.82
	(-0.73)	(-1.95)	(0.95)	(0.34)	(5.17)	(0.78)	(0.96)	(0.56)	(0.02)	(2.44)	(-5.23)	(1.97)	(-0.43)	(-0.97)	(0.64)	(-5.25)	(-2.13)	(-1.30)	(-0.08)	(0.80)
17. Coffee, tea, & cocoa	-1.31	0.30	0.27	-0.31	1.53	0.21	0.12	0.04	-0.70	0.18	0.62	-0.17	0.07	-0.21	-0.72	-0.21	-1.92	-0.10	-0.41	2.57
	(-1.87)	(0.54)	(0.32)	(-1.27)	(2.97)	(0.96)	(0.46)	(0.19)	(-2.10)	(1.56)	(2.46)	(-0.85)	(0.32)	(-0.64)	(-2.29)	(-1.94)	(-7.87)	(-0.91)	(-0.56)	(2.69)
18. Soft drink & juice	0.50	0.28	0.51	-0.69	0.47	0.07	0.14	-0.01	0.07	0.16	-0.22	-0.24	0.68	0.00	0.21	-0.13	-0.04	-2.16	0.76	-0.13
	(1.02)	(0.93)	(1.89)	(-2.58)	(2.19)	(0.45)	(0.61)	(-0.09)	(0.38)	(2.08)	(-1.79)	(-0.91)	(3.08)	(0.07)	(1.38)	(-1.24)	(-0.38)	(-6.66)	(0.91)	(-0.13)
19. All other goods	-0.11	-0.15	-0.09	-0.05	-0.06	0.00	-0.01	0.03	0.08	-0.04	-0.01	-0.02	-0.08	0.15	-0.02	0.00	0.00	0.00	-1.23	1.49
	(-0.99)	(-1.05)	(-0.97)	(-0.86)	(-1.08)	(-0.11)	(-0.08)	(0.21)	(0.79)	(-1.76)	(-0.42)	(-0.22)	(-1.97)	(1.47)	(-0.36)	(-0.12)	(-0.08)	(0.03)	(-4.78)	(7.00)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All elasticities are median values. Median t-values reported in parentheses.

Table 3c. Price and expenditure elasticities at the third expenditure quartile

Elasticity of demand for	With respect to price of																		Expenditure elasticity	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19
1. Rice	-1.57	1.06	-0.33	0.50	-0.62	0.01	0.00	0.52	-0.07	-0.04	0.05	0.15	0.07	0.40	-0.24	-0.08	-0.12	0.07	-0.11	0.46
	(-2.81)	(2.36)	(-0.90)	(2.62)	(-2.69)	(0.14)	(0.02)	(2.48)	(-0.09)	(-0.68)	(0.74)	(1.33)	(0.57)	(1.51)	(-1.18)	(-1.67)	(-1.64)	(0.76)	(-0.16)	(0.54)
2. Maize	0.67	-0.68	0.17	0.02	-0.27	-0.23	0.13	-0.04	-0.08	-0.02	0.02	-0.14	0.05	0.05	-0.08	-0.08	0.03	0.00	0.53	0.17
	(2.85)	(-3.24)	(2.02)	(0.53)	(-3.42)	(-2.14)	(1.83)	(-0.48)	(-0.80)	(-1.16)	(0.72)	(-1.77)	(1.00)	(0.34)	(-0.71)	(-1.89)	(1.38)	(0.28)	(1.60)	(0.71)
3. Cassava	-0.55	0.25	-1.06	-0.20	0.13	0.15	-0.27	-0.23	0.56	0.07	-0.13	0.12	0.12	-0.45	0.27	0.03	0.05	0.08	-0.84	1.75
	(-1.29)	(0.55)	(-2.06)	(-0.89)	(0.89)	(0.69)	(-1.42)	(-1.00)	(1.48)	(1.15)	(-1.47)	(0.56)	(1.00)	(-1.21)	(0.88)	(0.65)	(0.62)	(0.98)	(-0.99)	(1.87)
4. Wheat & other cereals	0.80	0.00	-0.19	-1.61	0.25	0.26	-0.18	0.16	-0.02	0.03	0.06	0.30	0.00	0.05	0.07	0.00	-0.04	-0.21	-0.51	0.83
	(2.45)	(0.19)	(-0.52)	(-5.36)	(2.20)	(1.78)	(-1.41)	(1.43)	(0.05)	(1.08)	(1.31)	(1.78)	(0.02)	(0.41)	(0.74)	(-0.14)	(-0.77)	(-2.16)	(-1.12)	(0.82)
5. Red meat	-0.91	-0.67	0.17	0.24	-0.39	-0.04	-0.06	0.14	-0.22	0.09	0.05	0.30	0.18	0.11	0.30	0.21	0.17	-0.31	-0.31	0.55
	(-3.40)	(-3.82)	(1.76)	(2.75)	(-2.13)	(-0.46)	(-0.62)	(1.72)	(-2.22)	(2.47)	(1.40)	(2.89)	(2.18)	(0.98)	(1.29)	(5.25)	(4.25)	(3.00)	(-0.91)	(1.26)
6. Poultry	-0.08	-1.13	0.23	0.35	-0.14	-1.77	-0.05	0.06	0.56	0.02	-0.06	-0.12	0.01	-0.24	0.17	0.00	0.07	-0.02	-0.54	2.38
	(-0.33)	(-2.65)	(0.24)	(1.75)	(-0.92)	(-6.62)	(-0.37)	(0.30)	(1.66)	(0.50)	(-0.76)	(-0.84)	(0.13)	(-0.83)	(0.62)	(0.03)	(0.81)	(-0.36)	(-0.84)	(3.45)
7. Fish & seafood	-0.05	0.23	-0.26	-0.19	-0.09	0.01	-1.70	0.21	0.40	0.03	0.04	0.09	0.15	-0.18	0.04	0.03	0.03	0.03	0.08	1.06
	(-0.19)	(1.29)	(-1.35)	(-1.61)	(-1.15)	(0.13)	(-8.24)	(2.05)	(2.39)	(0.88)	(0.89)	(0.85)	(1.97)	(-1.12)	(0.47)	(0.71)	(0.63)	(0.57)	(0.22)	(2.96)
8. Other meat	1.79	-0.05	-0.49	0.36	0.36	0.09	0.49	-2.83	0.42	0.27	0.01	-0.13	-0.17	-0.93	0.45	0.05	0.00	-0.11	1.06	-0.47
	(2.48)	(0.07)	(-0.53)	(1.60)	(1.60)	(0.66)	(1.82)	(-3.81)	(1.32)	(2.35)	(0.21)	(-0.15)	(-1.33)	(-1.83)	(1.61)	(0.55)	(0.47)	(-1.09)	(1.16)	(-0.63)
9. Dairy	-0.14	-0.30	0.63	-0.03	-0.28	0.38	0.39	0.18	-2.27	-0.07	0.22	0.09	-0.12	-0.17	-0.18	0.02	-0.09	-0.09	0.39	1.32
	(-0.45)	(-1.21)	(1.73)	(-0.22)	(-2.32)	(1.82)	(2.17)	(1.32)	(-6.16)	(-1.67)	(2.52)	(0.60)	(-1.40)	(-0.83)	(-1.64)	(0.32)	(-2.03)	(-1.05)	(0.47)	(2.50)
10. Fats and oils	-0.08	-0.10	0.19	0.07	0.17	0.07	0.09	0.19	-0.08	-0.94	0.24	-0.13	0.04	-0.06	-0.05	0.10	0.03	0.09	0.09	0.21
	(-0.41)	(-0.88)	(2.82)	(1.45)	(2.79)	(1.54)	(1.77)	(3.23)	(-0.72)	(-20.59)	(4.63)	(-1.68)	(0.77)	(-0.59)	(-0.03)	(3.64)	(2.08)	(2.83)	(0.28)	(0.76)
11. Fruit	0.10	-0.03	-0.21	0.09	0.08	-0.04	0.06	-0.02	0.37	0.22	-1.90	0.04	0.09	0.17	0.22	-0.29	0.16	-0.14	-0.17	1.20
	(0.42)	(-0.30)	(-1.71)	(1.44)	(0.95)	(-0.47)	(0.72)	(-0.32)	(2.93)	(3.88)	(-12.47)	(0.37)	(1.25)	(1.47)	(2.36)	(-5.08)	(3.28)	(-2.16)	(-0.41)	(4.37)
12. Vegetable	0.21	-0.33	0.17	0.24	0.29	-0.02	0.11	-0.08	0.11	-0.07	0.04	-1.01	-0.01	-0.12	0.07	0.04	0.03	-0.13	0.36	0.31
	(1.43)	(-1.91)	(1.22)	(2.12)	(2.37)	(0.08)	(1.17)	(-0.82)	(1.11)	(-1.80)	(1.14)	(-5.62)	(-0.36)	(-1.00)	(1.19)	(1.43)	(1.32)	(-1.97)	(0.77)	(1.28)
13. Pulses	0.20	0.22	0.24	0.03	0.30	0.05	0.26	-0.14	-0.13	0.04	0.10	0.02	-1.05	-0.03	0.02	0.03	0.06	0.22	-0.04	-0.20
	(0.69)	(1.33)	(2.30)	(0.22)	(2.33)	(0.73)	(2.30)	(-1.70)	(-0.81)	(0.90)	(1.48)	(0.32)	(-5.99)	(-0.15)	(0.90)	(0.91)	(1.91)	(2.94)	(-0.06)	(-0.62)
14. Roots and tubers	0.46	0.10	-0.29	0.05	0.10	-0.06	-0.09	-0.34	-0.08	-0.02	0.10	-0.09	-0.03	-1.61	-0.01	-0.01	-0.03	0.05	1.76	0.26
	(1.59)	(0.54)	(-0.53)	(0.58)	(1.01)	(-0.35)	(-0.57)	(-2.05)	(-0.34)	(-0.48)	(1.75)	(-0.56)	(-0.35)	(-4.12)	(0.44)	(-0.43)	(-0.32)	(0.75)	(2.56)	(0.01)
15. Sugar	-0.79	-0.57	0.56	0.11	0.17	0.24	0.05	0.37	-0.33	-0.10	0.24	0.09	-0.03	-0.11	-1.15	0.05	-0.16	0.04	-0.52	1.79
	(-1.37)	(-1.36)	(0.88)	(0.70)	(0.90)	(0.89)	(0.26)	(1.35)	(-1.37)	(-1.10)	(1.44)	(0.34)	(-0.05)	(-0.35)	(-5.30)	(0.55)	(-1.64)	(0.45)	(-0.70)	(2.24)
16. Egg	-0.92	-1.49	0.22	-0.05	2.48	0.03	0.20	0.16	0.12	0.43	-1.35	0.35	0.16	-0.15	0.18	-1.16	-0.10	-0.30	-0.09	1.14
	(-1.84)	(-1.94)	(0.74)	(-0.20)	(4.66)	(0.10)	(0.66)	(0.53)	(0.33)	(2.94)	(-4.81)	(1.30)	(0.79)	(-0.53)	(0.55)	(-5.07)	(-1.22)	(-1.24)	(-0.02)	(1.15)
17. Coffee, tea, and cocoa	-1.31	0.39	0.39	-0.26	1.44	0.32	0.13	-0.03	-0.60	0.08	0.62	0.14	0.26	-0.37	-0.58	-0.09	-1.72	-0.23	-0.79	1.93
	(-1.82)	(0.65)	(0.63)	(-1.12)	(2.76)	(1.22)	(0.42)	(-0.11)	(-1.84)	(0.97)	(2.30)	(0.53)	(1.30)	(-0.97)	(-2.01)	(-1.13)	(-7.77)	(-1.56)	(-0.81)	(2.54)
18. Soft drink and juice	0.40	0.05	0.31	-0.61	0.61	-0.02	0.15	-0.18	-0.25	0.19	-0.25	-0.47	0.53	0.24	0.09	-0.12	-0.10	-1.98	1.38	0.15
	(0.83)	(0.43)	(1.48)	(-2.28)	(2.53)	(-0.08)	(0.63)	(-1.15)	(-0.87)	(2.28)	(-1.86)	(-1.86)	(2.47)	(0.76)	(0.90)	(-1.16)	(-1.37)	(-5.98)	(1.49)	(-0.04)
19. All other goods and services	-0.08	-0.05	-0.05	-0.06	-0.07	0.01	-0.01	0.01	0.04	-0.03	-0.01	-0.04	-0.06	0.11	-0.01	0.00	0.00	0.02	-1.24	1.38
	(-0.95)	(-0.61)	(-0.92)	(-1.77)	(-1.82)	(0.05)	(-0.26)	(0.01)	(0.40)	(-1.82)	(-0.68)	(-0.97)	(-1.88)	(1.63)	(-0.41)	(-0.03)	(-0.55)	(0.77)	(-6.34)	(10.11)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All elasticities are median values. Median t-values reported in parentheses.

Table 3d. Price and expenditure elasticities at the fourth (top) expenditure quartile

Elasticity of demand for	With respect to price of																			Expenditure elasticity
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Rice	-1.50	0.96	-0.39	0.60	-0.63	-0.02	0.00	0.46	0.08	-0.02	0.05	0.05	0.06	0.46	-0.30	-0.14	-0.15	0.07	0.09	0.50
	(-2.26)	(1.80)	(-1.00)	(2.22)	(-2.21)	(-0.13)	(0.04)	(1.87)	(0.59)	(-0.26)	(0.58)	(0.59)	(0.42)	(1.30)	(-1.19)	(-1.81)	(-1.46)	(0.50)	(0.12)	(0.64)
2. Maize	0.84	-0.43	0.16	-0.11	-0.57	-0.30	0.27	-0.01	-0.16	-0.12	-0.04	-0.15	-0.08	0.05	-0.13	-0.13	0.05	-0.02	1.92	-0.42
	(2.33)	(-1.30)	(1.60)	(-0.58)	(-3.26)	(-1.76)	(1.87)	(0.11)	(-0.86)	(-2.36)	(-0.31)	(-1.21)	(-0.75)	(0.30)	(-0.78)	(-1.53)	(1.16)	(-0.03)	(2.09)	(-0.62)
3. Cassava	-0.63	0.23	-0.92	-0.18	0.03	0.14	-0.28	-0.38	0.60	0.08	-0.17	0.19	0.11	-0.44	0.40	0.02	0.09	0.06	-0.61	1.54
	(-1.19)	(0.48)	(-1.26)	(-0.62)	(0.09)	(0.47)	(-1.26)	(-0.98)	(1.30)	(1.03)	(-1.42)	(0.63)	(0.82)	(-0.92)	(0.97)	(0.27)	(0.76)	(0.46)	(-0.49)	(1.57)
4. Wheat & other cereals	0.89	-0.27	-0.15	-1.56	0.32	0.26	-0.23	0.36	0.10	0.01	0.14	0.32	-0.02	-0.03	0.10	-0.02	-0.04	-0.21	-1.00	1.05
	(2.19)	(-1.03)	(-0.42)	(-4.94)	(1.96)	(1.53)	(-1.32)	(1.94)	(0.59)	(0.54)	(1.60)	(1.60)	(-0.23)	(-0.26)	(0.75)	(-0.54)	(-0.75)	(-1.89)	(-1.52)	(1.24)
5. Red meat	-0.84	-1.00	0.04	0.29	-0.14	-0.14	-0.03	0.13	-0.14	0.15	0.03	0.20	0.24	0.11	0.38	0.20	0.24	-0.53	0.70	
	(-2.88)	(-3.77)	(0.54)	(2.53)	(-0.78)	(-1.25)	(-0.08)	(1.45)	(-1.22)	(2.73)	(0.71)	(1.97)	(2.09)	(1.46)	(1.14)	(4.71)	(3.61)	(2.93)	(-1.20)	(2.04)
6. Poultry	-0.12	-0.97	0.18	0.36	-0.29	-1.71	-0.13	0.02	0.61	0.01	-0.07	0.12	0.00	-0.34	0.18	-0.03	0.11	-0.06	-0.47	2.17
	(-0.45)	(-2.19)	(0.21)	(1.47)	(-1.46)	(-5.76)	(-0.65)	(-0.01)	(1.55)	(0.20)	(-0.62)	(0.51)	(0.05)	(-0.91)	(0.68)	(-0.49)	(1.04)	(-0.61)	(-0.58)	(3.18)
7. Fish & seafood	-0.04	0.45	-0.27	-0.25	-0.05	-0.07	-2.09	0.18	0.58	0.09	-0.02	0.08	0.34	-0.17	0.08	0.02	0.03	0.06	-0.07	1.06
	(-0.11)	(1.54)	(-1.28)	(-1.43)	(-0.44)	(-0.35)	(-7.06)	(1.34)	(2.21)	(1.57)	(-0.17)	(0.66)	(2.22)	(-0.86)	(0.54)	(0.26)	(0.53)	(0.56)	(-0.01)	(2.62)
8. Other meat	1.55	0.01	-0.75	0.78	0.35	0.04	0.38	-2.48	0.52	0.26	-0.03	0.04	-0.34	-0.92	0.45	0.06	-0.03	-0.25	0.96	-0.19
	(1.98)	(0.18)	(-0.82)	(2.04)	(1.38)	(0.29)	(1.36)	(-3.26)	(1.22)	(1.95)	(-0.07)	(0.45)	(-1.61)	(-1.54)	(1.43)	(0.50)	(0.01)	(-1.50)	(0.77)	(-0.31)
9. Dairy	0.08	-0.34	0.58	0.08	-0.18	0.41	0.50	0.23	-2.22	-0.02	0.28	0.19	-0.19	-0.34	-0.14	0.04	-0.08	-0.20	-0.06	1.24
	(0.35)	(-1.16)	(1.64)	(0.51)	(-1.46)	(1.68)	(1.97)	(1.23)	(-5.26)	(-0.37)	(2.44)	(1.02)	(-1.40)	(-1.25)	(-1.23)	(0.60)	(-1.71)	(-1.65)	(-0.19)	(2.15)
10. Fats and oils	-0.04	-0.48	0.16	0.05	0.33	0.04	0.17	0.20	-0.01	-0.88	0.28	-0.22	0.06	-0.07	-0.18	0.18	0.00	0.16	0.24	0.22
	(0.15)	(-2.85)	(2.27)	(0.91)	(3.14)	(0.80)	(2.16)	(2.84)	(0.19)	(-14.66)	(3.97)	(-1.88)	(0.79)	(-0.29)	(-1.58)	(3.60)	(0.37)	(2.85)	(0.60)	(0.60)
11. Fruit	0.10	-0.18	-0.26	0.24	0.06	-0.06	-0.02	-0.04	0.50	0.23	-1.85	0.18	0.15	0.13	0.34	-0.37	0.18	-0.19	-0.14	1.01
	(0.36)	(-0.84)	(-1.59)	(2.28)	(0.56)	(-0.45)	(-0.18)	(-0.36)	(2.81)	(3.41)	(-10.36)	(1.53)	(1.30)	(0.86)	(2.58)	(-4.76)	(2.95)	(-1.98)	(-0.17)	(3.39)
12. Vegetable	0.10	-0.33	0.23	0.36	0.26	0.12	0.11	0.00	0.24	-0.11	0.13	-0.69	-0.10	-0.33	0.18	0.02	0.09	-0.27	0.53	-0.18
	(0.78)	(-1.35)	(1.15)	(1.89)	(1.79)	(0.92)	(0.97)	(0.38)	(1.20)	(-1.69)	(1.63)	(-3.21)	(-1.11)	(-1.36)	(1.42)	(0.59)	(1.98)	(-1.98)	(0.67)	(-0.19)
13. Pulses	0.22	-0.25	0.21	0.00	0.49	0.04	0.56	-0.29	-0.31	0.07	0.18	-0.14	-0.74	0.08	-0.09	0.13	0.13	0.24	0.29	-0.36
	(0.58)	(-0.62)	(1.66)	(0.08)	(2.27)	(0.37)	(2.37)	(-1.72)	(-1.21)	(0.90)	(1.39)	(-0.99)	(-3.01)	(0.62)	(-0.06)	(1.75)	(1.93)	(2.35)	(0.37)	(-0.97)
14. Roots and tubers	0.55	0.04	-0.30	-0.01	0.21	-0.15	-0.10	-0.36	-0.26	-0.03	0.07	-0.25	0.03	-1.60	-0.14	0.00	-0.07	0.14	2.05	0.41
	(1.39)	(0.24)	(-0.53)	(-0.05)	(1.38)	(-0.63)	(-0.36)	(-1.74)	(-1.04)	(-0.47)	(1.11)	(-1.38)	(0.30)	(-3.51)	(-0.39)	(0.16)	(-0.89)	(1.16)	(2.00)	(0.34)
15. Sugar	-0.91	-0.57	0.76	0.18	0.24	0.27	0.13	0.41	-0.27	-0.20	0.39	0.29	-0.13	-0.38	-1.09	0.06	-0.14	-0.02	-0.45	1.38
	(-1.31)	(-1.15)	(1.00)	(0.82)	(0.90)	(0.84)	(0.50)	(1.22)	(-1.01)	(-1.39)	(1.63)	(0.89)	(-0.50)	(-0.76)	(-3.05)	(0.46)	(-1.28)	(-0.05)	(-0.51)	(1.84)
16. Egg	-1.39	-1.53	0.13	-0.16	2.64	-0.14	0.09	0.17	0.24	0.59	-1.40	0.11	0.47	0.00	0.17	-1.11	0.03	-0.29	-0.30	1.51
	(-2.02)	(-1.75)	(0.42)	(-0.60)	(3.52)	(-0.43)	(0.19)	(0.44)	(0.56)	(2.61)	(-3.70)	(0.36)	(1.57)	(-0.03)	(0.48)	(-4.74)	(0.35)	(-1.10)	(-0.08)	(2.05)
17. Coffee, tea, and cocoa	-1.38	0.48	0.54	-0.23	1.41	0.45	0.15	-0.11	-0.50	-0.01	0.66	0.48	0.44	-0.56	-0.44	0.04	-1.51	-0.37	-1.06	1.36
	(-1.63)	(0.67)	(0.87)	(-0.93)	(2.42)	(1.18)	(0.36)	(-0.30)	(-1.56)	(-0.09)	(2.11)	(1.48)	(1.55)	(-1.14)	(-1.58)	(0.39)	(-6.06)	(-1.76)	(-0.85)	(2.14)
18. Soft drink and juice	0.30	-0.13	0.16	-0.56	0.76	-0.10	0.16	-0.33	-0.55	0.23	-0.29	-0.68	0.40	0.48	-0.01	-0.12	-0.16	-1.79	2.20	0.37
	(0.56)	(-0.07)	(0.87)	(-1.80)	(2.38)	(-0.42)	(0.62)	(-1.46)	(-1.51)	(2.18)	(-1.77)	(-2.00)	(1.93)	(1.17)	(0.18)	(-0.96)	(-1.70)	(-4.99)	(1.51)	(0.19)
19. All other goods and services	-0.04	0.02	-0.01	-0.05	-0.05	0.02	-0.01	0.00	0.01	-0.02	-0.01	-0.04	-0.03	0.08	-0.01	0.00	-0.01	0.02	-1.25	1.26
	(-0.93)	(0.40)	(-0.74)	(-2.43)	(-2.26)	(0.47)	(-0.49)	(-0.55)	(-0.02)	(-1.84)	(-0.70)	(-1.80)	(-1.76)	(1.65)	(-0.35)	(0.07)	(-1.14)	(1.84)	(-8.59)	(14.89)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All elasticities are median values. Median t-values reported in parentheses.

Table 4a. Energy and nutrient elasticities at the first (bottom) expenditure quartile

Elasticity of availability of	With respect to price of																			With respect to total expenditure
	1. Rice	2. Maize	3. Cassava	4. Wheat & oth cereals	5. Red meat	6. Poultry	7. Fish & seafood	8. Oth meat	9. Dairy	10. Fats & oils	11. Fruit	12. Vegetable	13. Pulses	14. Roots & tubbers	15. Sugar	16. Egg	17. Coffee, tea, & cocoa	18. Soft drink & juice	19. All other goods	
Energy	0.14	-0.26	-0.11	-0.05	-0.02	-0.02	-0.08	-0.02	0.02	0.00	-0.05	0.06	-0.13	-0.01	-0.01	0.01	0.03	-0.28	0.79	
	(1.38)	(-1.86)	(-0.74)	(-1.88)	(-1.29)	(0.11)	(-1.90)	(-0.70)	(0.14)	(-0.47)	(0.07)	(-0.57)	(1.44)	(-1.89)	(0.00)	(-0.71)	(0.75)	(0.76)	(-0.91)	(2.94)
Protein	0.20	-0.24	0.00	-0.07	-0.04	-0.03	-0.18	-0.01	-0.02	0.02	0.00	-0.07	-0.06	-0.09	0.00	-0.01	0.01	0.03	-0.05	0.62
	(3.04)	(-2.35)	(0.32)	(-2.87)	(-1.50)	(-0.24)	(-4.82)	(-0.70)	(-0.16)	(1.68)	(0.40)	(-1.04)	(-1.88)	(-1.73)	(0.35)	(-0.07)	(1.47)	(0.72)	(-0.23)	(3.85)
Vitamin A	0.39	0.13	-0.31	0.15	-0.01	0.02	-0.08	-0.36	0.13	-0.03	0.12	-0.12	-0.10	-1.52	0.16	-0.03	0.01	-0.07	1.49	0.14
	(1.80)	(0.75)	(-0.87)	(1.38)	(0.27)	(0.22)	(-0.78)	(-2.81)	(0.95)	(-0.64)	(1.92)	(-0.92)	(-0.74)	(-4.96)	(1.33)	(-0.74)	(0.23)	(-0.80)	(3.05)	(0.18)
Vitamin C	-0.18	0.12	-0.83	-0.12	0.26	0.12	-0.23	-0.15	0.43	0.04	-0.12	-0.23	0.06	-0.65	0.12	0.03	0.01	0.07	-0.40	1.64
	(-0.45)	(0.71)	(-2.65)	(-0.57)	(1.76)	(1.02)	(-1.83)	(-1.55)	(2.01)	(0.38)	(-1.64)	(-1.89)	(0.31)	(-3.11)	(1.27)	(0.56)	(0.78)	(-0.35)	(2.03)	
Vitamin D	-0.06	-0.09	-0.30	-0.12	-0.17	0.15	-1.24	0.28	0.21	-0.06	0.14	0.12	-0.09	-0.24	0.00	0.05	0.03	0.01	0.26	1.10
	(-0.16)	(-0.56)	(-1.54)	(-1.39)	(-1.67)	(1.11)	(-7.22)	(2.44)	(1.76)	(-1.41)	(2.27)	(1.06)	(-0.88)	(-1.43)	(0.04)	(0.97)	(0.71)	(0.12)	(0.89)	(2.79)
Vitamin B12	-0.32	-0.11	-0.01	-0.10	-0.31	0.18	-0.86	0.23	-0.27	-0.08	0.14	0.17	-0.05	-0.15	-0.03	0.07	0.04	0.04	0.42	0.98
	(-1.45)	(-0.80)	(-0.14)	(-1.33)	(-3.41)	(1.67)	(-6.96)	(2.48)	(-1.63)	(-2.06)	(3.11)	(1.82)	(-0.56)	(-1.40)	(-0.16)	(1.72)	(1.23)	(0.75)	(1.07)	(3.15)
Iron	0.35	-0.38	-0.02	-0.05	0.04	-0.06	-0.05	-0.09	0.03	0.05	0.00	-0.14	-0.02	-0.13	0.01	-0.02	0.01	0.03	-0.18	0.63
	(4.34)	(-3.41)	(0.00)	(-2.35)	(0.54)	(-0.74)	(-1.74)	(-2.22)	(0.48)	(2.44)	(0.13)	(-2.21)	(-0.94)	(-2.24)	(0.47)	(-1.32)	(1.20)	(0.41)	(-0.53)	(3.41)
Calcium	-0.04	-0.02	-0.15	-0.13	0.01	0.10	-0.35	0.02	-0.13	-0.03	-0.01	-0.19	-0.09	-0.24	0.00	0.02	-0.01	0.05	0.16	1.05
	(-0.01)	(-0.12)	(-1.24)	(-2.40)	(-0.11)	(1.96)	(-5.76)	(0.11)	(-1.27)	(-1.43)	(0.17)	(-2.33)	(-2.18)	(-2.81)	(0.42)	(0.94)	(-0.10)	(0.63)	(0.73)	(3.51)
Phosphorus	0.24	-0.36	-0.06	-0.05	-0.01	-0.04	-0.13	-0.04	0.01	0.04	0.01	-0.09	0.02	-0.11	0.00	-0.01	0.01	0.04	-0.21	0.75
	(3.13)	(-3.17)	(-0.41)	(-2.21)	(-1.09)	(-0.35)	(-3.28)	(-1.01)	(0.03)	(1.92)	(0.48)	(-1.26)	(0.07)	(-1.87)	(0.28)	(-0.87)	(1.21)	(0.82)	(-0.84)	(3.73)
Potassium	0.15	-0.15	-0.24	-0.02	0.06	0.01	-0.13	-0.11	0.13	0.03	-0.02	-0.13	-0.05	-0.43	0.06	-0.01	0.01	0.04	-0.06	0.84
	(1.57)	(-1.11)	(-1.39)	(-0.56)	(0.54)	(0.41)	(-2.29)	(-2.23)	(1.45)	(0.78)	(-0.33)	(-1.69)	(-1.68)	(-4.32)	(1.23)	(-0.84)	(1.08)	(1.13)	(0.38)	(2.37)
Saturated fat	-0.09	0.17	0.20	-0.02	-0.09	0.08	-0.04	0.07	-0.26	-0.56	0.01	-0.02	0.02	-0.05	0.07	0.00	0.07	0.02	0.05	0.40
	(-0.23)	(1.79)	(2.87)	(-1.33)	(-1.88)	(2.01)	(-0.90)	(0.84)	(-3.94)	(-22.15)	(0.12)	(-0.28)	(0.89)	(-0.84)	(1.54)	(0.44)	(3.95)	(0.92)	(0.16)	(3.12)
Unsaturated fat	0.22	-0.29	0.12	-0.03	-0.04	-0.04	-0.03	-0.04	-0.08	-0.12	-0.13	-0.08	0.03	-0.01	0.02	-0.02	0.05	0.02	-0.08	0.58
	(3.51)	(-3.23)	(2.04)	(-1.88)	(-0.89)	(-0.75)	(-0.87)	(-1.76)	(-1.28)	(-7.74)	(-4.43)	(-1.28)	(1.11)	(-0.46)	(0.83)	(-0.88)	(4.24)	(0.65)	(-0.55)	(4.44)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All nutrient elasticities are median values. Median t-values reported in parentheses.

Table 4b. Energy and nutrient elasticities at the second expenditure quartile

Elasticity of availability of	With respect to price of																			With respect to total expenditure
	1. Rice	2. Maize	3. Cassava	4. Wheat & oth cereals	5. Red meat	6. Poultry	7. Fish & seafood	8. Oth meat	9. Dairy	10. Fats & oils	11. Fruit	12. Vegetable	13. Pulses	14. Roots & tubbers	15. Sugar	16. Egg	17. Coffee, tea, & cocoa	18. Soft drink & juice	19. All other goods	
Energy	0.08	-0.21	-0.06	0.00	-0.11	-0.05	-0.03	0.01	-0.02	-0.03	0.00	-0.04	0.03	-0.11	-0.04	-0.02	0.01	0.03	0.00	0.59
	(0.82)	(-1.24)	(-0.06)	(-0.28)	(-2.90)	(-0.56)	(-1.05)	(0.30)	(-0.28)	(-2.47)	(0.56)	(-0.07)	(0.71)	(-1.60)	(-0.51)	(-1.55)	(0.58)	(1.05)	(0.28)	(2.32)
Protein	0.14	-0.20	0.02	-0.02	-0.09	-0.06	-0.17	0.02	-0.04	0.01	0.00	-0.05	-0.06	-0.07	-0.01	-0.01	0.02	0.03	0.08	0.52
	(1.77)	(-1.67)	(0.81)	(-1.11)	(-2.64)	(-0.87)	(-4.01)	(0.47)	(-0.55)	(0.90)	(0.59)	(-0.32)	(-1.96)	(-1.30)	(0.28)	(-0.43)	(2.01)	(1.28)	(0.48)	(2.93)
Vitamin A	0.39	0.07	-0.25	0.10	0.07	-0.02	-0.06	-0.31	0.01	-0.03	0.09	-0.17	-0.05	-1.41	0.07	-0.01	-0.01	-0.02	1.46	0.22
	(1.90)	(0.60)	(-0.43)	(1.30)	(1.02)	(-0.14)	(-0.60)	(-2.67)	(0.27)	(-0.81)	(1.74)	(-1.24)	(-0.62)	(-4.75)	(1.00)	(-0.39)	(-0.02)	(-0.29)	(3.10)	(0.02)
Vitamin C	-0.07	0.09	-0.58	-0.04	0.18	0.06	-0.15	-0.18	0.31	0.03	-0.14	-0.23	0.03	-0.63	0.14	0.01	0.02	0.02	0.02	1.10
	(0.32)	(0.85)	(-2.15)	(0.15)	(1.87)	(0.69)	(-1.75)	(-2.35)	(1.87)	(0.31)	(-1.95)	(-2.23)	(0.38)	(-4.23)	(1.46)	(-0.12)	(0.90)	(0.41)	(1.07)	(1.87)
Vitamin D	-0.04	0.08	-0.27	-0.15	-0.11	0.07	-1.46	0.21	0.31	-0.01	0.08	0.10	0.04	-0.20	0.02	0.03	0.03	0.02	0.17	1.04
	(-0.05)	(0.52)	(-1.48)	(-1.66)	(-1.42)	(0.80)	(-8.51)	(2.00)	(2.47)	(-0.15)	(1.80)	(1.02)	(0.73)	(-1.44)	(0.40)	(0.85)	(0.74)	(0.40)	(0.49)	(2.86)
Vitamin B12	-0.29	-0.09	0.01	-0.08	-0.24	0.11	-0.87	0.19	-0.27	-0.02	0.10	0.15	0.04	-0.12	0.00	0.07	0.04	0.04	0.24	0.96
	(-1.86)	(-0.79)	(0.20)	(-1.11)	(-3.15)	(1.58)	(-7.76)	(2.32)	(-2.11)	(-0.60)	(2.95)	(2.04)	(1.04)	(-1.30)	(0.30)	(2.49)	(1.65)	(1.03)	(0.68)	(3.26)
Iron	0.36	-0.36	0.02	-0.01	-0.03	-0.08	0.00	-0.07	0.00	0.02	0.00	-0.13	-0.07	-0.15	0.00	-0.03	0.02	0.03	0.10	0.44
	(4.08)	(-3.11)	(0.83)	(-1.15)	(-1.13)	(-1.17)	(-0.45)	(-1.79)	(0.18)	(1.07)	(0.56)	(-1.96)	(-2.21)	(-2.87)	(0.37)	(-1.81)	(1.87)	(0.83)	(1.28)	(2.49)
Calcium	-0.01	-0.01	-0.04	-0.08	-0.02	0.09	-0.36	0.03	-0.24	-0.02	0.01	-0.14	-0.08	-0.24	0.00	0.01	0.00	0.02	0.23	0.90
	(0.47)	(0.07)	(-0.28)	(-1.84)	(-0.21)	(1.81)	(-6.13)	(0.41)	(-2.48)	(-1.41)	(0.80)	(-2.08)	(-2.04)	(-3.33)	(0.59)	(0.51)	(0.26)	(0.35)	(1.14)	(3.59)
Phosphorus	0.23	-0.31	-0.01	-0.01	-0.09	-0.07	-0.09	-0.01	-0.04	0.02	0.00	-0.07	-0.02	-0.09	-0.01	-0.03	0.02	0.03	0.04	0.57
	(2.63)	(-2.53)	(0.41)	(-0.90)	(-2.98)	(-0.98)	(-2.64)	(-0.21)	(-0.63)	(0.61)	(0.75)	(-0.77)	(-0.95)	(-1.83)	(0.03)	(-1.71)	(1.50)	(1.15)	(0.60)	(3.31)
Potassium	0.20	-0.14	-0.14	0.01	0.01	-0.03	-0.08	-0.11	0.04	0.01	-0.03	-0.12	-0.07	-0.45	0.04	-0.02	0.02	0.03	0.07	0.58
	(2.09)	(-0.73)	(-0.57)	(0.17)	(0.10)	(-0.20)	(-1.78)	(-2.43)	(0.70)	(0.03)	(-0.17)	(-1.83)	(-1.78)	(-4.53)	(1.05)	(-1.12)	(1.21)	(1.17)	(2.22)	(1.78)
Saturated fat	-0.06	-0.02	0.16	-0.01	-0.02	0.05	0.00	0.08	-0.21	-0.50	-0.02	-0.02	0.02	-0.04	0.03	0.03	0.06	0.03	0.07	0.44
	(-0.14)	(0.09)	(2.72)	(-0.66)	(-0.20)	(1.80)	(-0.03)	(1.62)	(-3.20)	(-18.87)	(0.10)	(-0.17)	(0.89)	(-0.81)	(1.12)	(2.11)	(3.79)	(1.36)	(0.35)	(2.34)
Unsaturated fat	0.18	-0.30	0.12	0.01	-0.06	-0.07	0.00	-0.02	-0.08	-0.15	-0.13	-0.05	0.00	-0.01	0.02	-0.02	0.05	0.02	0.05	0.49
	(2.46)	(-3.21)	(2.46)	(-0.05)	(-1.19)	(-1.10)	(0.09)	(-1.05)	(-1.23)	(-8.42)	(-3.63)	(-0.50)	(0.07)	(-0.54)	(1.04)	(-0.30)	(4.47)	(1.26)	(0.17)	(3.23)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All nutrient elasticities are median values. Median t-values reported in parentheses.

Table 4c. Energy and nutrient elasticities at the third expenditure quartile

Elasticity of availability of	With respect to price of																		With respect to total expenditure	
	1. Rice	2. Maize	3. Cassava	4. Wheat & other cereals	5. Red meat	6. Poultry	7. Fish & seafood	8. Other meat	9. Dairy	10. Fats & oils	11. Fruit	12. Vegetable	13. Pulses	14. Roots & tubers	15. Sugar	16. Egg	17. Coffee, tea, & cocoa	18. Soft drink & juice		19. All other goods
Energy	0.03 (0.41)	-0.14 (-0.78)	-0.03 (0.31)	0.01 (0.33)	-0.15 (-2.59)	-0.06 (-0.64)	0.01 (-0.03)	0.06 (1.07)	-0.06 (-0.66)	-0.09 (-3.69)	0.01 (0.94)	-0.02 (-0.17)	0.00 (0.21)	-0.08 (-0.82)	-0.08 (-1.07)	-0.03 (-1.27)	0.00 (0.15)	0.02 (1.09)	0.24 (0.92)	0.46 (1.49)
Protein	0.08 (0.85)	-0.14 (-1.10)	0.01 (0.77)	-0.02 (-0.28)	-0.13 (-2.31)	-0.08 (-0.94)	-0.17 (-2.48)	0.03 (0.95)	-0.05 (-0.83)	0.01 (0.63)	0.00 (0.67)	-0.02 (-0.06)	-0.08 (-1.66)	-0.04 (-0.42)	-0.02 (-0.06)	-0.01 (-0.27)	0.03 (2.04)	0.03 (1.32)	0.23 (0.84)	0.44 (1.70)
Vitamin A	0.37 (1.79)	0.02 (0.29)	-0.19 (-0.20)	0.08 (1.12)	0.12 (1.60)	-0.04 (-0.33)	-0.05 (-0.34)	-0.27 (-2.34)	-0.07 (-0.40)	-0.03 (-0.90)	0.07 (1.45)	-0.21 (-1.58)	-0.02 (-0.31)	-1.29 (-4.13)	0.00 (0.55)	0.00 (0.09)	-0.01 (-0.25)	0.01 (0.18)	1.45 (2.90)	0.30 (0.13)
Vitamin C	0.02 (0.72)	0.03 (0.53)	-0.38 (-1.13)	0.03 (0.51)	0.16 (1.98)	0.03 (0.41)	-0.12 (-1.28)	-0.19 (-2.11)	0.23 (1.54)	0.02 (0.00)	-0.15 (-2.17)	-0.27 (-2.54)	0.02 (0.37)	-0.62 (-3.74)	0.13 (1.39)	-0.01 (-0.34)	0.03 (0.94)	0.00 (0.21)	0.27 (1.53)	0.81 (1.48)
Vitamin D	-0.03 (-0.01)	0.21 (1.20)	-0.25 (-1.31)	-0.18 (-1.51)	-0.07 (-0.81)	0.01 (0.15)	-1.66 (-8.13)	0.17 (1.30)	0.40 (2.45)	0.03 (1.14)	0.03 (0.73)	0.09 (0.84)	0.15 (1.94)	-0.18 (-1.24)	0.05 (0.60)	0.02 (0.54)	0.02 (0.64)	0.03 (0.46)	0.09 (0.27)	1.05 (2.87)
Vitamin B12	-0.29 (-2.05)	-0.11 (-1.06)	0.00 (0.31)	-0.05 (-0.35)	-0.18 (-2.11)	0.05 (0.83)	-0.87 (-6.86)	0.16 (1.93)	-0.21 (-1.87)	0.03 (2.12)	0.07 (2.28)	0.15 (2.00)	0.11 (0.93)	-0.10 (-0.93)	0.03 (0.68)	0.09 (2.98)	0.05 (2.01)	0.05 (1.25)	0.04 (-0.03)	0.96 (3.19)
Iron	0.37 (3.12)	-0.29 (-1.91)	0.04 (1.28)	-0.01 (-0.70)	-0.07 (-1.17)	-0.07 (-1.09)	0.07 (1.20)	-0.06 (-1.03)	-0.04 (-0.48)	0.00 (-0.46)	-0.01 (0.55)	-0.11 (-1.58)	-0.13 (-2.28)	-0.13 (-1.79)	-0.02 (-0.12)	-0.04 (-1.40)	0.03 (2.05)	0.03 (1.26)	0.38 (1.85)	0.27 (0.96)
Calcium	0.03 (0.77)	0.01 (0.19)	0.01 (0.38)	-0.06 (-1.47)	-0.01 (0.34)	0.08 (1.58)	-0.40 (-4.74)	0.05 (0.72)	-0.29 (-2.83)	0.00 (-0.30)	0.02 (1.28)	-0.08 (-1.25)	-0.08 (-1.89)	-0.22 (-2.63)	0.00 (0.45)	0.01 (0.41)	0.00 (0.59)	0.00 (0.17)	0.21 (0.85)	0.81 (3.10)
Phosphorus	0.21 (1.80)	-0.22 (-1.38)	0.01 (0.82)	-0.02 (-0.22)	-0.14 (-2.95)	-0.08 (-1.05)	-0.07 (-1.60)	0.01 (0.30)	-0.09 (-1.12)	0.00 (-0.18)	0.00 (0.70)	-0.05 (-0.41)	-0.05 (-1.38)	-0.07 (-0.94)	-0.03 (-0.36)	-0.02 (-1.54)	0.02 (1.52)	0.02 (1.20)	0.29 (1.40)	0.42 (1.80)
Potassium	0.22 (2.09)	-0.12 (-0.59)	-0.09 (-0.02)	0.02 (0.42)	0.00 (0.40)	-0.05 (-0.52)	-0.04 (-0.82)	-0.11 (-1.98)	-0.03 (-0.27)	-0.03 (-0.30)	-0.03 (-0.11)	-0.12 (-1.74)	-0.09 (-1.70)	-0.44 (-3.83)	0.01 (0.58)	-0.02 (-0.76)	0.02 (1.14)	0.03 (1.28)	0.54 (2.50)	0.43 (0.97)
Saturated fat	-0.05 (-0.08)	-0.18 (-2.04)	0.13 (2.36)	0.00 (-0.04)	0.06 (1.53)	0.04 (1.31)	0.02 (0.68)	0.11 (2.06)	-0.14 (-1.92)	-0.52 (-15.87)	0.01 (0.99)	-0.03 (-0.55)	0.03 (0.84)	-0.04 (-0.54)	-0.01 (0.49)	0.06 (3.05)	0.05 (2.99)	0.05 (1.80)	0.06 (0.29)	0.45 (2.10)
Unsaturated fat	0.11 (0.96)	-0.27 (-2.69)	0.12 (2.61)	0.03 (0.75)	-0.02 (-0.02)	-0.05 (-0.70)	0.04 (1.26)	0.04 (0.78)	-0.07 (-1.20)	-0.33 (-11.85)	-0.04 (-0.38)	-0.05 (-0.74)	-0.02 (-0.32)	-0.02 (-0.33)	0.00 (0.39)	0.02 (1.53)	0.05 (3.55)	0.05 (2.06)	0.17 (0.64)	0.39 (1.70)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All nutrient elasticities are median values. Median t-values reported in parentheses.

Table 4d. Energy and nutrient elasticities at the fourth (top) expenditure quartile

Elasticity of availability of	With respect to price of																		With respect to total expenditure	
	1. Rice	2. Maize	3. Cassava	4. Wheat & other cereals	5. Red meat	6. Poultry	7. Fish & seafood	8. Other meat	9. Dairy	10. Fats & oils	11. Fruit	12. Vegetable	13. Pulses	14. Roots & tubers	15. Sugar	16. Egg	17. Coffee, tea, & cocoa	18. Soft drink & juice		19. All other goods
Energy	-0.06 (0.00)	-0.05 (-0.24)	-0.07 (0.02)	-0.01 (0.34)	-0.20 (-2.16)	-0.08 (-0.49)	0.03 (0.49)	0.10 (1.14)	-0.04 (-0.48)	-0.10 (-2.34)	0.01 (0.68)	-0.01 (-0.04)	-0.02 (0.09)	-0.04 (-0.10)	-0.12 (-1.23)	-0.04 (-1.11)	0.00 (0.02)	0.02 (0.71)	0.59 (1.02)	0.35 (0.44)
Protein	0.00 (0.24)	-0.08 (-0.47)	-0.05 (0.04)	-0.06 (0.03)	-0.12 (-1.60)	-0.09 (-0.74)	-0.24 (-1.49)	0.06 (1.15)	-0.01 (-0.30)	0.01 (0.39)	0.01 (0.84)	-0.01 (-0.07)	-0.04 (-0.57)	-0.02 (0.34)	-0.02 (-0.28)	0.00 (0.15)	0.04 (1.89)	0.03 (0.99)	0.44 (1.24)	0.37 (0.43)
Vitamin A	0.34 (1.55)	-0.08 (-0.18)	-0.13 (0.16)	0.09 (1.29)	0.20 (1.89)	-0.06 (-0.28)	-0.04 (-0.00)	-0.24 (-1.69)	-0.14 (-0.58)	-0.03 (-1.06)	0.06 (1.08)	-0.30 (-1.76)	0.00 (-0.08)	-1.14 (-3.44)	-0.03 (0.26)	0.01 (0.48)	-0.01 (-0.03)	0.02 (-0.03)	1.52 (2.38)	0.30 (-0.04)
Vitamin C	-0.03 (0.09)	-0.02 (0.07)	-0.29 (-0.55)	0.08 (0.73)	0.15 (1.95)	0.04 (0.50)	-0.16 (-1.10)	-0.18 (-1.57)	0.29 (1.48)	0.01 (-0.03)	-0.20 (-2.74)	-0.20 (-2.08)	0.02 (0.37)	-0.57 (-2.55)	0.19 (1.40)	-0.02 (-0.29)	0.06 (1.31)	-0.05 (-0.28)	0.36 (1.02)	0.62 (1.02)
Vitamin D	-0.04 (-0.07)	0.41 (1.42)	-0.26 (-1.24)	-0.24 (-1.31)	-0.01 (0.03)	-0.07 (-0.36)	-2.03 (-7.02)	0.16 (0.81)	0.57 (2.26)	0.10 (1.78)	-0.03 (-0.41)	0.08 (0.68)	0.33 (2.21)	-0.18 (-0.94)	0.08 (0.61)	0.01 (-0.06)	0.03 (0.52)	0.05 (0.47)	-0.07 (0.00)	1.05 (2.59)
Vitamin B12	-0.34 (-2.01)	-0.22 (-1.68)	-0.04 (0.05)	0.01 (0.48)	-0.07 (-0.57)	-0.04 (-0.20)	-0.88 (-5.13)	0.16 (1.74)	-0.10 (-1.31)	0.11 (3.30)	0.03 (1.36)	0.15 (1.83)	0.22 (2.27)	-0.05 (-0.34)	0.06 (0.84)	0.14 (3.13)	0.08 (2.19)	0.08 (1.54)	-0.22 (-0.55)	0.94 (3.03)
Iron	0.36 (2.05)	-0.22 (-0.78)	0.02 (0.92)	-0.08 (-0.64)	-0.10 (-0.35)	-0.11 (-0.63)	0.15 (1.88)	-0.06 (-0.29)	-0.08 (-0.62)	-0.03 (-0.80)	0.00 (0.46)	-0.11 (-1.24)	-0.16 (-1.64)	-0.12 (-0.64)	-0.05 (-0.32)	-0.03 (-0.52)	0.05 (2.04)	0.03 (1.06)	0.97 (1.86)	0.03 (-0.64)
Calcium	0.05 (0.71)	0.02 (-0.04)	0.01 (0.51)	-0.06 (-0.48)	0.05 (1.39)	0.08 (1.38)	-0.49 (-2.80)	0.06 (0.68)	-0.26 (-2.18)	0.03 (0.75)	0.04 (1.63)	-0.03 (-0.41)	-0.02 (-0.85)	-0.24 (-1.69)	0.01 (0.37)	0.02 (0.70)	0.02 (1.02)	-0.03 (-0.38)	0.22 (0.58)	0.69 (1.72)
Phosphorus	0.15 (0.90)	-0.10 (-0.30)	-0.03 (0.24)	-0.06 (-0.04)	-0.19 (-2.28)	-0.10 (-0.68)	-0.09 (-0.39)	0.03 (0.60)	-0.10 (-0.96)	-0.01 (-0.46)	0.00 (0.55)	-0.03 (-0.20)	-0.07 (-0.93)	-0.05 (0.04)	-0.05 (-0.51)	-0.03 (-0.96)	0.03 (1.49)	0.02 (0.70)	0.73 (1.57)	0.25 (0.14)
Potassium	0.20 (1.42)	-0.12 (-0.41)	-0.09 (0.06)	0.00 (0.52)	0.01 (0.75)	-0.06 (-0.29)	-0.02 (0.28)	-0.10 (-1.22)	-0.07 (-0.43)	-0.07 (-0.37)	-0.03 (-0.18)	-0.13 (-1.78)	-0.09 (-1.22)	-0.39 (-2.40)	0.00 (0.37)	-0.01 (0.05)	0.04 (1.59)	0.03 (1.26)	0.84 (1.94)	0.28 (0.15)
Saturated fat	-0.05 (0.06)	-0.46 (-3.45)	0.09 (1.70)	0.01 (0.32)	0.18 (2.31)	0.01 (0.43)	0.05 (1.08)	0.14 (2.20)	-0.06 (-0.58)	-0.47 (-11.38)	0.04 (0.90)	-0.06 (-0.79)	0.06 (1.06)	-0.04 (-0.18)	-0.06 (-0.57)	0.12 (3.17)	0.04 (2.07)	0.09 (2.11)	0.11 (0.39)	0.46 (1.76)
Unsaturated fat	0.09 (0.66)	-0.42 (-2.29)	0.06 (1.44)	0.01 (0.57)	-0.01 (-0.03)	-0.11 (-1.11)	0.06 (1.25)	0.03 (0.47)	-0.07 (-0.86)	-0.17 (-4.56)	-0.05 (-0.57)	-0.02 (-0.38)	-0.03 (-0.41)	0.00 (0.30)	-0.02 (-0.07)	0.06 (1.72)	0.07 (3.03)	0.06 (1.97)	0.42 (1.26)	0.32 (0.48)

Note: Expenditure quartiles defined based on per capita total expenditures. Red meat includes beef and lamb. Other meat includes pork, wild animal, and processed meat products. All nutrient elasticities are median values. Median t-values reported in parentheses.

Appendix. Derivation of Nutrient Elasticities

Following Huang (1996) and Huang and Lin (2000), we derive the expenditure elasticity for nutrients as follows. The general food demand equation for the i th food can be expressed as:

$$(A1) \quad q_i = f(p_1, \dots, p_n, m).$$

Totally differentiating (A1) with respect to prices and total expenditures yields

$$(A2) \quad \frac{dq_i}{q_i} = \sum_j e_{ij} (dp_j / p_j) + \eta_i (dm/m).$$

The total quantity of nutrient k , φ_k , is equal to

$$(A3) \quad \varphi_k = \sum_i a_{ki} q_i$$

where a_{ki} is the quantity of nutrient k per unit of food category i . Total differentiation of (3) with respect to prices and total expenditures yields

$$(A4) \quad \begin{aligned} d\varphi_k / \varphi_k &= \sum_i a_{ki} dq_i / \varphi_k \\ &= \sum_i a_{ki} \left[\sum_j e_{ij} (dp_j / p_j) + \eta_i (dm/m) \right] q_i / \varphi_k \\ &= \sum_j \pi_{kj} (dp_j / p_j) + \rho_k (dm/m) \end{aligned}$$

where $\pi_{kj} = \sum_i a_{ki} q_i e_{ij} / \varphi_k$ is the elasticity of demand for the k th nutrient with respect to price of the j th food, and $\rho_k = \sum_i a_{ki} q_i \eta_i / \varphi_k$ is the total expenditure elasticity of demand for the k th nutrient.

¹ Another desirable property of the EASI model that is absent from the AID family and many other demand systems is its ability to embed unobserved preference heterogeneity in calculating compensating variations using micro data. Because our study is not concerned with consumer welfare analysis, this feature is less important in our application.

² For example, Thompson (2004) documented the widespread (improper) practice of estimating conditional food demand assuming group expenditure being exogenous.

³ Following Lewbel and Pendakur (2009), we use the Hicksian price elasticities, total expenditure elasticities and the Slutsky equation to recover the Marshallian price elasticities. The correct formula for total expenditure elasticities for the EASI demand can be found in Zhen et al. (2014, p. 12).

Rules-Based Transparent System for Emergency Food Imports

Tanzania SERA Policy Project¹

June 30, 2016

Tanzania imports large quantities of basic food staples such as palm oil, rice, sugar, and wheat and occasionally has large imports of maize. While imports are needed to meet local demand, they often disrupt domestic markets when quantities imported exceed market requirements or when large imports are authorized by the Government but not anticipated by the private sector. This can lead to price volatility and increased risks for producers, traders, and stockholders. A more transparent and predictable staple foods import policy could encourage increased development of the staple food crops sectors, provide additional tariff revenue to Government, and reduce market uncertainty. It would also reduce the need for ad hoc policy decisions that can lead to regional trade disputes, and provide a more stable market environment for the commodity exchange that is currently being developed.

One of the challenges of implementing an effective staple foods import policy is the difficulty of controlling illegal imports that enter Tanzania from neighbouring countries and through major Tanzanian sea ports. They are illegal in the sense that they don't have import permits as required, and they don't pay the import tariff. The magnitude of these illegal imports is unknown, but they can be estimated by comparing the reported exports to Tanzania from other countries to the imports reported by Tanzania. For example, exports of rice to Tanzania reported by all exporting countries were two to three times as large as imports reported by Tanzania during 2011-2015. That suggests that large imports were unrecorded, but even that may underestimate actual imports because some exports going to neighbouring countries actually get diverted to Tanzania. A similar situation existed for sugar, with exports to Tanzania being reported as about twice as large as imports reported by Tanzania (Table 1). Other staple food crops showed less divergence between reported exports and reported imports.

Controlling illegal imports is difficult because Tanzania has long and porous land borders with neighbouring countries and a long coast which allows easy access for small quantities of food staples. Illegal imports also enter the mainland Tanzanian market through other channels, including transit goods that remain in country and improperly labelled imports that are not detected by customs. However, large quantities of illegal imports are also reported to enter through Tanzania's major sea ports. The loss in tariff revenue from illegal imports is substantial

¹ Prepared by Don Mitchell, Senior Advisor, USAID-Funded Tanzania SERA Policy Project with assistance of Aneth Kayombo, Policy Analyst of Tanzania SERA Policy Project.

and could provide funding for upgrading customs as well as general budget support. The loss of tariff revenue from rice was approximately 60 million USD per year during 2011-2015 based on the difference between reported exports and reported imports, and the loss of tariff revenue on sugar was approximately 62 million USD per year over the same period. If only one-half of this tariff revenue could be collected in the future, it would be a substantial contribution to the Tanzanian budget.

Table 1: Tanzania's Imports of Staple Foods.

	Years	----- Average Imports (metric tons)-----	
		<i>Reported by Tanzania</i>	<i>Reported by Exporters</i>
Maize	2005-2010	53,936	58,811
	2010-2015	44,358	30,062
Palm Oil	2005-2010	262,931	221,619
	2010-2015	286,789	325,130
Rice	2005-2010	51,402	95,343
	2010-2015	50,747	149,045
Sugar	2005-2010	47,472	109,050
	2010-2015	127,793	275,263
Wheat	2005-2010	708,731	538,193
	2010-2015	855,514	738,117

Source: UN Comtrade.

Tanzania has higher import tariffs on food staples than many of its neighbouring countries and that creates incentives to import staple food crops into neighbouring countries and sell them in the Tanzanian market without paying the tariff. Kenya, for example, has a 35 percent tariff on rice imported from Pakistan while Tanzania has an import tariff of 75 percent. That provides incentives for Kenyan traders to import at the lower tariff and sell in Tanzania. Zanzibar also has a lower import tariff of 12.5% on rice compared to the mainland and that encourages traders to import more than is required for Zanzibar's consumption and sell the surplus on the mainland. The approximate magnitude of these surplus imports in Zanzibar can be estimated and have been as much as 30,000 tons of rice per year beyond the quantities required to meet domestic demand in Zanzibar.

With such large tariff differentials and the relative ease with which illegal imports can enter by land and sea, it is very difficult to control illegal imports from neighbouring countries. In response to this situation, the Government of the United Republic of Tanzania (GoT) has often relied on quantitative controls and occasional bans on imports of rice and sugar (The Citizen, March 15, 2016) in an effort to control illegal imports. Quantitative controls are implemented by restricting

the issuing of import permits; however, Tanzania has not been very effective in monitoring and controlling illegal imports. In some cases, import permits were issued for a specified quantity but actual imports exceeded the quantities authorized. This occurred in 2013 when duty-free rice imports were authorized, but the actual imports were much larger than the quantities authorized and the imports disrupted the domestic market causing prices to fall sharply. There are also reports of import permits being issued for larger quantities than required to balance the market (The Daily News, February 19, 2016) which also disrupts local markets. The longer term consequences of such disruptions are to cause greater price volatility and greater uncertainty for producers and other stakeholders and therefore less investment.

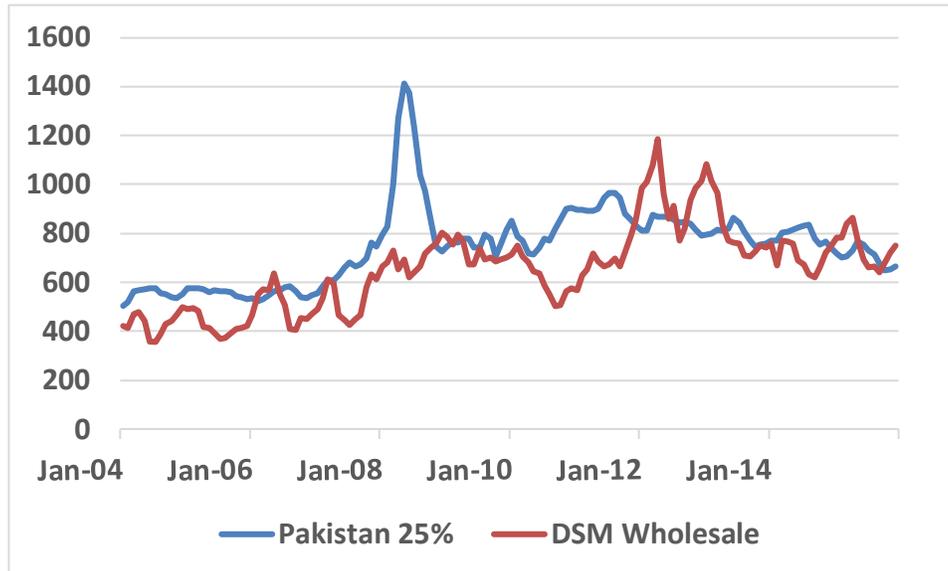
A staple food import policy that relies on established tariffs would be less disruptive to domestic markets, generate greater tariff revenue to Government, and would operate automatically under normal market conditions. It would also be more compatible with policies of the East Africa Community and less likely to create regional trade disputes. However, in order for such a policy to operate effectively, it would be necessary to control illegal imports. Some illegal imports would continue, but more effective monitoring and enforcement of staple foods import policies and tariffs could reduce illegal imports especially through major sea ports.

A Market-Driven Staple Foods Import Policy

To illustrate how such a market-driven policy would operate, consider the case of rice imports. Figure 1 shows the domestic wholesale price of rice in Dar es Salaam (DSM) compared to the duty-paid landed price of rice from Pakistan, which is the largest exporter of rice to Tanzania.² The Pakistan import price is higher than the DSM price in most periods and imports would have been unprofitable for the private sector in those periods. However, when the Tanzanian price increased in 2011 and 2012, imports of Pakistan rice would have been profitable and imports would have moderated the domestic price increases in rice. The margin between the domestic rice prices and imported Pakistan rice prices reached USD 170 per metric ton in January 2012 and should have been sufficient to encourage imports and moderate further domestic price increases. Instead, domestic rice prices continued to rise and the margin between domestic and imported rice rose to USD 320 per ton by April 2012.

² The Pakistan rice price is FOB Karachi for 25% broken white rice plus ocean freight, insurance, and handling to achieve a landed Dar es Salaam price in U.S. dollars. The Tanzanian price is the wholesale price from the Ministry of Industry and Trade expressed in U.S. dollars and adjusted for quality to allow comparability with imported Pakistan rice.

Figure 1. DSM and Pakistan Rice Prices.



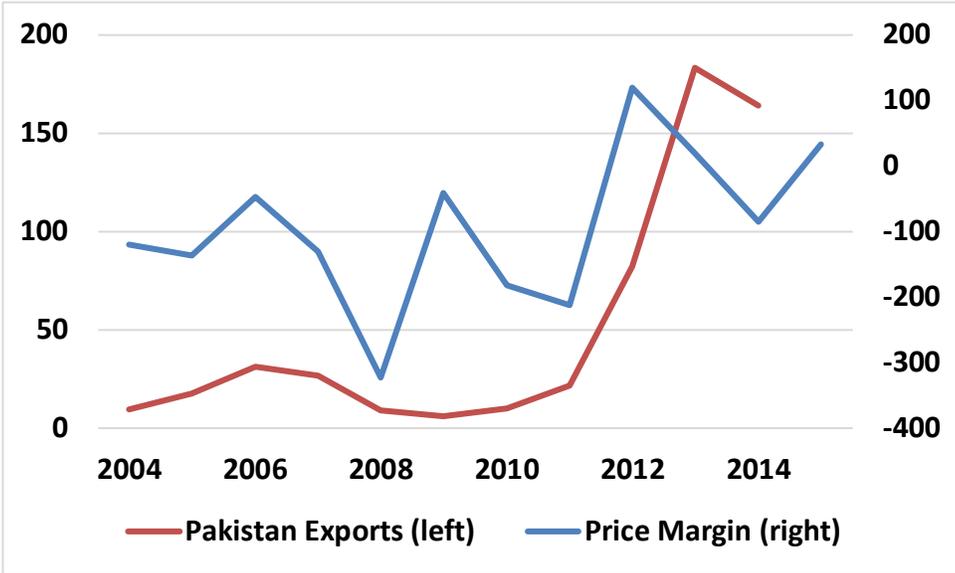
Source: SERA based on Ministry of Industry and Trade and FAO data.

A similar situation occurred in 2013 when domestic prices rose, and the margin between domestic and imported rice rose to USD 285 per metric ton in January 2013. The private sector would have had the incentive to import to moderate the increase in domestic prices and could have done so profitably while paying the 75 percent import tariff. They would have also been cautious to not import more than the market required because that could have caused the price to fall below the level where imports were profitable. The Government would not have needed to intervene in the market and prices would have been moderated by imports. Figure 2 shows Pakistan's rice exports to Tanzania (left axis in thousand metric tons) and the margin between the DSM rice prices and the Pakistan duty-paid landed prices (right axis in USD). When the price margin exceeds USD 100 per metric tons, Pakistan's rice exports increased from less than 20,000 tons to more than 100,000 tons.

The Government responded to the rise in rice prices in 2012 by inviting the private sector to apply for authorization to import rice duty free. More than 70 firms applied and nine were selected and authorized to import 30,000 tons of rice (MAFC 2013). However, actual imports far exceeded the authorized imports and led to sharp price decreases just prior to the domestic harvest. Domestic rice prices continued to rise until April when large imports arrived and then declined by 35 percent over the following four months. Some of the imported rice was sold to neighbouring countries which led to trade disputes and countervailing import tariffs. If the private sector had been allowed to import at the prevailing tariffs, actual imports would have been smaller and more timely and prices would not have increased as much or fallen as far. It would not have been necessary to reduce the tariff, and the disruption to the market would have been less since the

private sector would have been aware of the market conditions in both the domestic and international market. The experience of rice imports in 2013 illustrates the difficulty of implementing an ad hoc policy decision and the importance of careful analysis to understand market demand. A more transparent rules-based policy would have been more effective in moderating the rise in domestic prices and caused less disruptions to the market. And, a better understanding of domestic market requirements and global and domestic food prices would also have shown that it was not necessary to allow duty-free imports.

Figure 2. Pakistan Rice Exports (thousand tons) vs. Import Price Margin (USD/ton).



Source: SERA based on Ministry of Industry and Trade and FAO data.

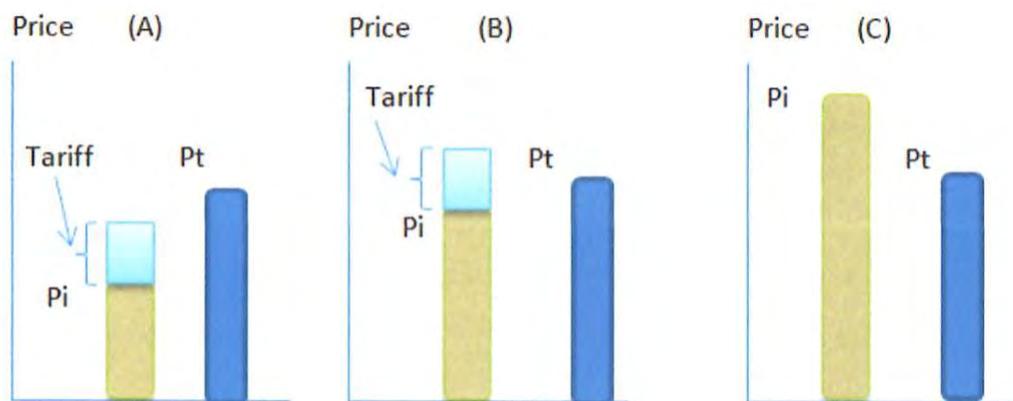
Market Situations

There are three market situations that can exist between Tanzanian and world market prices. The duty-paid import price could be below the domestic Tanzanian price and imports would be profitable; the duty-paid import price could be above the domestic price and imports would only be profitable at a reduced tariff; or the import price could be above the domestic price even with a zero tariff and imports would be unprofitable even without tariff. These three situations are shown in Figure 3. The import price includes all transport costs and adjustments for quality differences and is shown as Pi in Figure 3. The import tariff is then added to Pi to obtain the total import price of Pi + Tariff. The domestic Tanzanian price is denoted as Pt in Figure 3. As noted, Pi + Tariff can be: 1) low enough that imports are profitable after paying the tariff (Figure 3 A), 2) high enough that imports are not profitable at Pt unless the tariff is reduced (Figure 3 B), or 3) above Pt even when the import tariff is zero (Figure 3 C). In the first case, imports are profitable

when the import tariff is paid and imports will enter the domestic market if allowed and drive down the domestic price to the level where the import price is equal to the domestic price including the tariff. In the second case, imports will not be profitable unless the import tariff is reduced. In the third case, imports from the world market will not be profitable because the world market price exceeds the domestic price even with a zero import tariff (this situation existed in 2008 when world market rice prices rose sharply during the global food crisis).

The normal market situation for most staple foods is depicted by Figure 3A and 3B. Both the import price and the domestic price fluctuate in response to changing demand and supply conditions and imports may be profitable in one period and not in the next. When importers are able to evade the tariff, imports will be profitable most of the time and that is why there is rice from many other countries in the domestic market even when reported imports are zero. The situation depicted in Figure 3C is very unusual and prior to 2008 had not occurred since the 1970s.

Figure 3. Relationship between import and domestic prices.



Source: SERA.

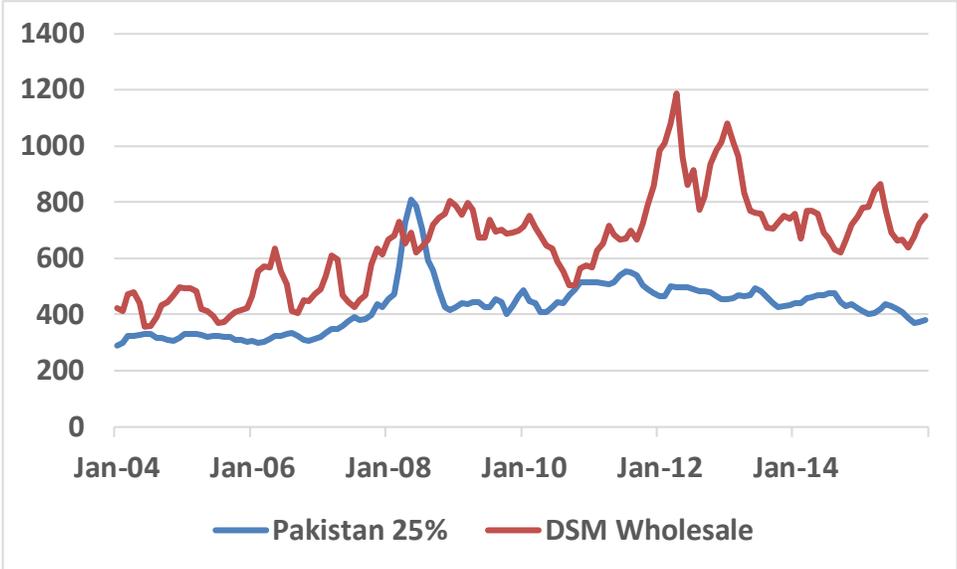
Emergency food imports are not needed in case 1) (Figure 3A) when the world market price plus tariff is below P_t , because imports will be profitable by the private sector and, if permitted, they will lower domestic prices and eliminate the need for emergency food imports. At the other extreme, case 3) (Figure 3C), imports will not be profitable even when the import tariff is zero and extreme measures will be required to protect consumers from high prices. This occurred in some countries in 2008 but not in Tanzania because domestic prices did not rise significantly. The situation where emergency food imports should be considered is case 2) (Figure 3B). In that case, imports will not be profitable for the private sector unless the tariff is reduced and the challenge for government is how to reduce the tariff to make imports profitable without unduly disrupting the domestic market or causing a trade dispute with neighbouring countries.

There are two policy instruments that can be used to allow emergency imports in case 2. The import tariff can be reduced and import quantities can be limited through quantitative

restrictions, such as import permits. If the reduction in the tariff is just sufficient to allow imports, but not so large as to encourage excessive imports, then the quantitative restrictions may not be needed because imports will cause the domestic price to fall until imports are no longer profitable. However, if the reduction in the import tariff is larger than required to allow sufficient imports to cap the price increases then the quantitative restrictions will be needed to limit imports and prevent disrupting local markets. These two policy instruments can be combined to allow emergency imports without unduly disrupting domestic markets. Regardless of which policy instruments are used, it is important to obtain approval for the use of these instruments from the East Africa Community to avoid trade disputes as occurred when rice was imported duty-free in 2013 and then exported to neighbouring countries. Such approval should be agreed before the emergency food imports are needed in order to avoid delays in implementing the rules-based system for imports. Figure 4 shows the Pakistan rice prices landed in Dar es Salaam without duty. Imports would be profitable in all periods except during the global food crisis in 2008.

The reduction in the import tariff that is sufficient to encourage imports without unduly disrupting the domestic market or causing trade disputes should be based on the differential between the domestic price and the import price. It should be large enough to encourage imports but not so large and to disrupt the domestic market. As shown in Figure 2, rice imports from Pakistan surged when the price differential exceeded USD 100 per ton and that should be sufficient to encourage imports. The tariff reduction should be for a specified period such as three months and renewed if necessary.

Figure 4. DSM and Pakistan Rice Prices (Ex Tariff).



Source: SERA based on Ministry of Industry and Trade and FAO data.

The third case as shown as Figure 3 (C) is when the import price P_i is above the Tanzanian domestic price P_t with a zero import tariff as occurred in 2008. In such a situation, imports are not profitable for the private sector. This is unusual and occurred during the global food crisis in 2008-2009. In such cases, Tanzania should rely on its own food reserves, and appeal to the international community for assistance. Such assistance will quickly become available as was the case during the global food crisis of 2008-2009, when the World Bank launched the Global Food Crisis Response which mixed fast-track funding with trust fund grants totalling US\$1.6 billion to 49 countries mostly in Africa (World Bank 2013). There are also other measures that can be taken to reduce the burden of higher prices on consumers, including increased food assistance to the lower income segments of society and reducing tariffs on other food crops such as wheat.

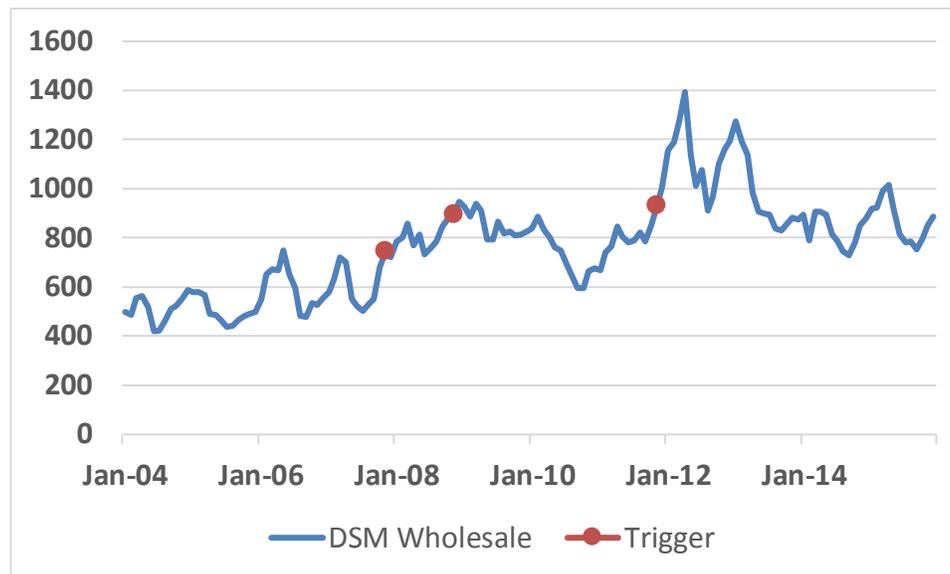
A Government Regulated Staple Foods Import Policy

A market-driven staple foods import policy is preferred for many reasons, but it requires that the Government be able to control illegal imports especially through major sea ports. If that is not possible, then an alternative approach is for the Government to use quantitative controls to limit imports instead of tariffs. Under this approach, the Government would authorize imports only when needed to meet domestic demand and prevent large price increases. Better monitoring of domestic demand, supply, and prices would be required; and the decision to authorize imports would need to be made in a timely manner to ensure imports arrive when needed without depressing prices in the following season. It would still be important to prevent illegal imports, but authorizing imports only during certain periods or circumstances would make that easier. The Government would need to decide 1) when to authorize imports, 2) the quantity of imports to authorize, and 3) the tariff and other conditions that applied. Improved monitoring of domestic, regional, and global markets would be important. The mechanism (trigger) that would be used to authorize imports should be based on both domestic prices and an assessment of the demand-supply situation. The quantities of imports to authorize should be based on an assessment of the market shortfall, and the import tariff that would apply should be based on the prices in the global or regional markets and quantities required to meet domestic demand.

The mechanism (trigger) that would indicate that imports are needed should include an analysis of prices since they reflect market conditions and are available on a timely basis. If prices are rising following harvest, that is an indication that production was not adequate to meet market demand for the following year and that imports may be required. Figure 5 shows an example of a price trigger that would have signalled the need for imports in several cases when prices were rising. It is computed as the average of September to November wholesale prices compared to the average of January to August wholesale prices for Dar es Salaam. When this ratio increases by 10 percent it signals that a market shortage is likely and imports may be needed. It is not sufficient to rely exclusively on this price mechanism without further analysis, but is a signal that

a potential shortage may develop and it should be followed with a review of the market situation. Since a price trigger cannot be relied upon exclusively, further analysis will be needed. However, such a price trigger could be an early warning tool worth monitoring.

Figure 5. DSM Rice Price and Trigger Price.



Source: SERA.

Complying with East African Community Regulations

The Common External Tariffs (CET) of the East African Community (EAC) are published in the Import Duty Rates of the EAC CET and are adopted by the Council of Ministers. However, under the Duty Remissions Scheme, a member state can apply for a stay of the prevailing CET. If granted by the Council of Ministers, the member state is given a waiver that allows it to apply a rate that is different from the CET. A waiver is normally granted for a fixed period of time such as one year. The official notification of a waiver is published in June. Once a waiver is granted, a request can be made to extend it and that is normally approved on an annual basis. Goods imported at the lower import duty under the waiver and then re-exported to other EAC members are subject to the import tariff rate applicable in the importing country. This may be the CET rate, or if the importing country has its own waiver, the prevailing rate of the country. The process through which waivers or an extension of a waiver are requested is through the pre-budget consultation meeting of the Ministers of Finance.

Food security related waivers are handled differently from waivers on other goods. When there is a food security concern, the Coordinating Ministers of a member country writes to the secretariat and requests an extraordinary meeting of the Council of Ministers to be convened. The written request specifies the product and the proposed change to the CET or waiver. This

request is copied to the Coordinating Ministers in the other member countries so that they are aware of the issues. The secretariat then arranges for an extraordinary meeting, which can take from one to three weeks. The Council of Ministers almost always approves the request for a waiver if food security concerns are the justification. Countries applying for a waiver will specify a time period and specific rate (usually zero) and a specified quantity. If products imported under the food security concern are re-exported, the importing country will apply whatever rate it applies to imports from outside the EAC. When a country imports food under the food security concerns, there is some question about when it is free to export to the rest of the Community without paying the tariff that would apply to re-exports. The secretariat is working to improve the audit schemes in order to address this problem.

Conclusions

A transparent rules-based system for staple food imports would have several advantages for Tanzania. It would reduce the need for ad hoc policy decisions on staple food imports that are subject to influence from powerful business and political interests. It would reduce uncertainty and price risk about the magnitude and timing of food imports and thereby encourage investments in staple food crops production, trading, and storage. It would provide more stable food prices and more reliable food supplies for consumers, and it would increase tariff revenue collections for Government. It would also reduce the risk of trade disputes with neighbouring countries resulting from staple food imports, and it would provide a more stable business environment for the commodity exchange that is currently being developed.

There are several ways that such a system could operate. However, it is essential that large-scale illegal imports be controlled or it will not be possible to operate any transparent rules-based system effectively. According to international data sources, imports of some staple foods, such as rice and sugar, were two to three times larger than reported by Tanzanian customs during 2011-2015. Those imports represent the large-scale imports that come through major sea ports, but there are many other sources of illegal imports that are not recorded such as imports across porous land borders with neighbouring countries, imports through established border posts that are unrecorded, imports brought on small dhows from countries with lower tariffs, and transit goods that remain in country. It will not be possible to eliminate illegal imports, but greater efforts are required in order for a transparent rules-based system to operate. The focus should be on the large-scale imports that enter through sea ports while monitoring cross border and small dhow traffic will be much more difficult.

If large-scale illegal imports can be controlled and the designated tariffs collected on legal imports, then imports could be at the discretion of the private sector under normal market conditions. When the margin between domestic prices and landed imports from the world market are favourable, the private sector will have an incentive to import to supply the domestic

market and that will moderate domestic price increases. Decisions on the timing and magnitude of imports will be made by the private sector and the Government's role would be to monitor markets and the operation of the private sector. An alternative approach would be for the Government to take responsibility for determining the magnitude of imports and issuing import permits for the required quantities. This would require the Government to monitor domestic food markets and develop better procedures for estimating food import requirements. It would also need to devote additional resources to monitoring regional and global markets in order to anticipate future market developments.

On occasion global food prices will be too high to allow the private sector to import food staples profitably. In those conditions, the Government should be prepared to reduce the import tariff in order to increase incentives for imports and ensure national food security. Such actions should be coordinated with the East Africa Community and prior approval negotiated on the grounds of food security. If the reduction in tariffs is not sufficient to make imports profitable for the private sector (which has only occurred once in the past 40 years) then domestic food reserves should be used, and the Government should approach the international community for assistance. Such assistance was provided during the global food crisis of 2008-2009 and would likely be available in the event of a similar global food crisis.

Next Steps

In order for the Government to adopt a rules-based system for staple foods imports, it must strengthen its ability to monitor and control illegal imports, and develop the capacity to monitor regional and global food markets. Controlling illegal imports should focus initially on large-scale imports through major sea ports and border posts. This must involve customs and get Government support for new procedures to control illegal imports. Once this is done, efforts should focus on reducing imports through informal panya routes and coastal trade using dhows from neighbouring countries and Zanzibar. A Market Intelligence Unit should be created and tasked with analysing domestic and regional staple food markets and prices in order to support a rules-based system. Then the specific approach and rules of operation must be developed and procedures agreed to with the East Africa Community.

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FROM THE AMERICAN PEOPLE

Rules-Based Transparent System for Emergency Food Imports

SERA Policy Project

Protea Courtyard Hotel July 5, 2016



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Context

Food imports from world market are needed to meet domestic demand for palm oil, rice, sugar, and wheat and they are not usually available in the regional market.

Maize imports are needed occasionally but are sourced from the regional market.

Cross-border trade also occurs in many other products but is largely unrecorded.



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Context

Tariffs (75% on rice, 100% on sugar) keep domestic prices higher than world market prices and encourage large imports from world market that would flood the domestic market if not controlled.

Government responds with quantitative controls (import permits and bans on imports).

Encourages illegal imports through large sea ports, dhow trade, transit goods that are diverted, and border posts



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Context

Regular flow of illegal imports of rice and sugar from
Zanzibar and neighboring countries

difficult to control

quantities are relatively small



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Problem

Large flows through major ports

- loss of tariff revenue to Government (\$120 million/year on rice and sugar)
- import surges can disrupt local markets
- create uncertainty for producers, stockholders and traders, regional trade disputes and undermine the operation of the commodity exchange



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Tanzania's food imports, 2011-2015 (thousand metric tons)

Years	Reported by Tanzania	Reported by Exporters	Difference
Maize	44.4	30.1	-14.3
Palm Oil	286.8	325.1	38.3
Rice	59.7	149.0	98.3
Sugar	127.8	275.3	147.5
Wheat	855.5	738.1	-117.4



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Example of Rice Imports in 2013

- Domestic rice prices increasing in 2012
- Government announced duty-free rice imports
- Authorized 30,000 tons of imports
- Actual imports were 85,000 tons
- Domestic market prices fell sharply
- Domestic producers outraged
- Some of the imported rice was sold to neighbouring countries and they imposed restrictions and tariffs on all Tanzanian exports
- Illustrates problem of ad hoc policies



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Market-Driven Import Policy that relies on established import tariffs

- Control illegal imports through major ports
- Enforce tariffs on imports
- Allow private sector to import freely
- Monitor imports and prices



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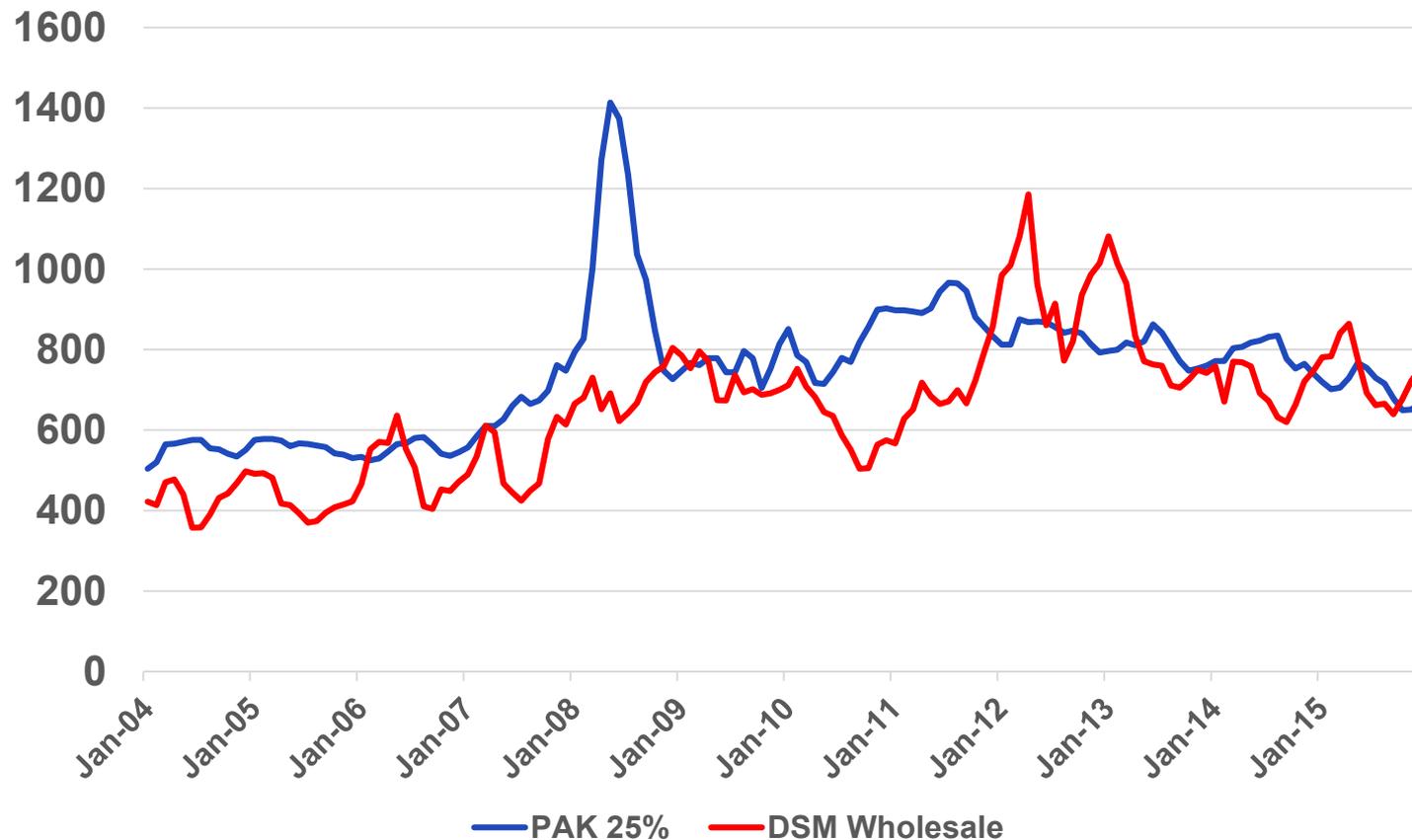
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Benefits of a Market Driven System

- Less disruptive of domestic markets
- Generate tariff revenue
- Compatible with EAC policies
- Less likely to create regional trade disputes
- Could operate automatically under normal market conditions

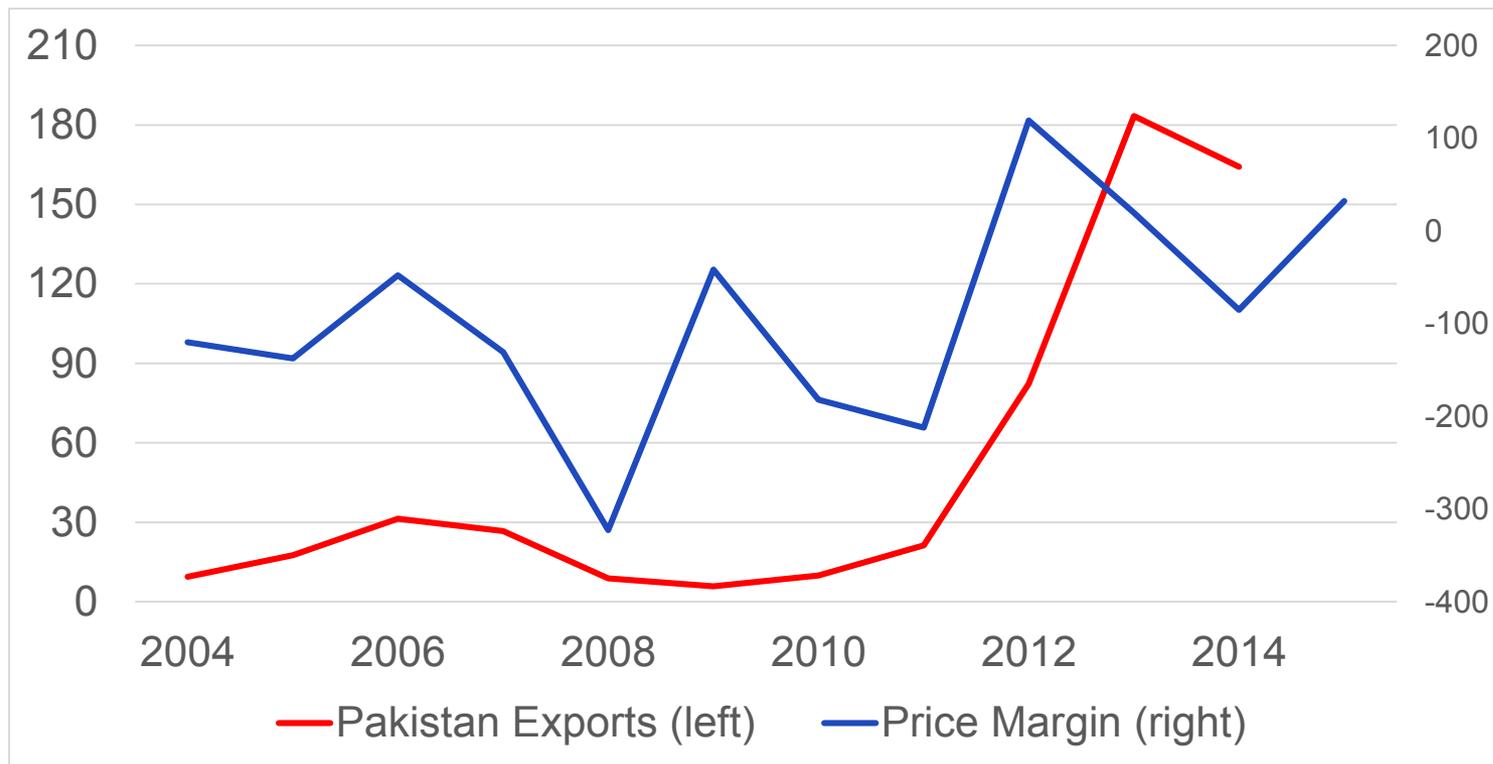


Pakistan (landed) and Dar es Salaam Rice Price





Pakistan Rice Exports (thousand tons) vs Import Price Margin (right axis \$/ton)





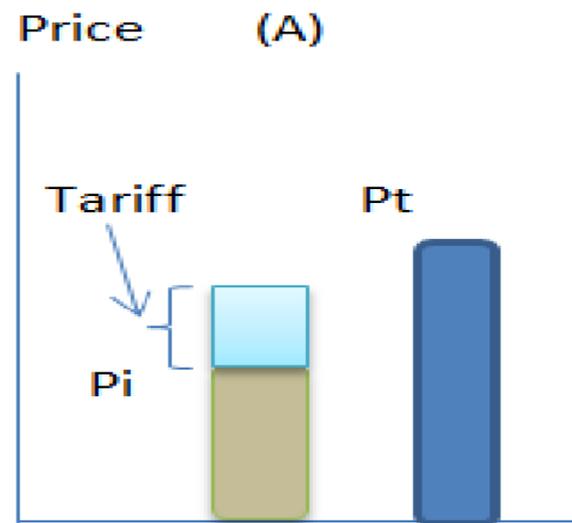
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Market Situation

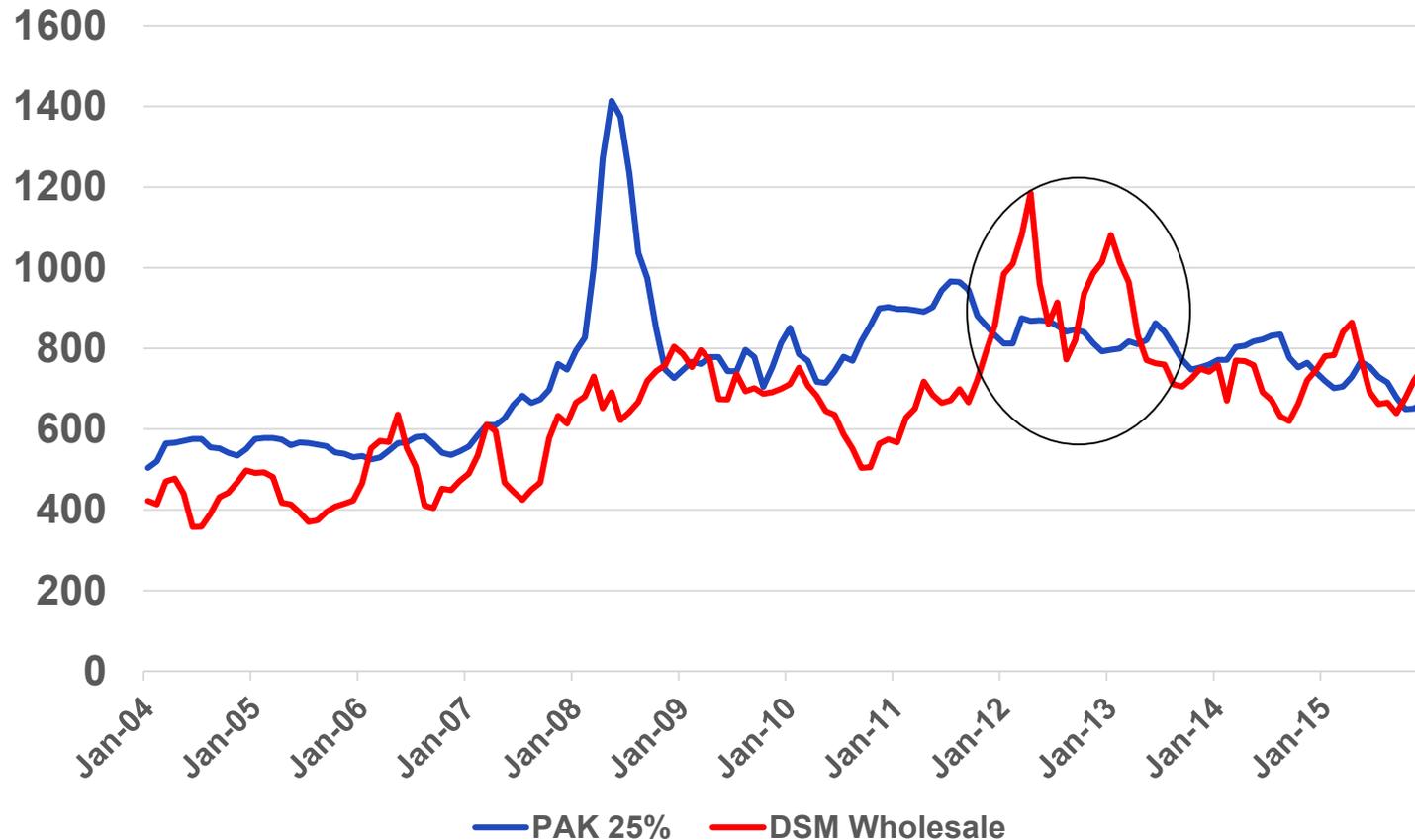
Case A: Price in Tanzania is above the world market import price plus EAC tariff

Private sector can import profitably and pay the import tariff and imports will cap prices in Tanzania.





Pakistan (landed) and Dar es Salaam Rice Price

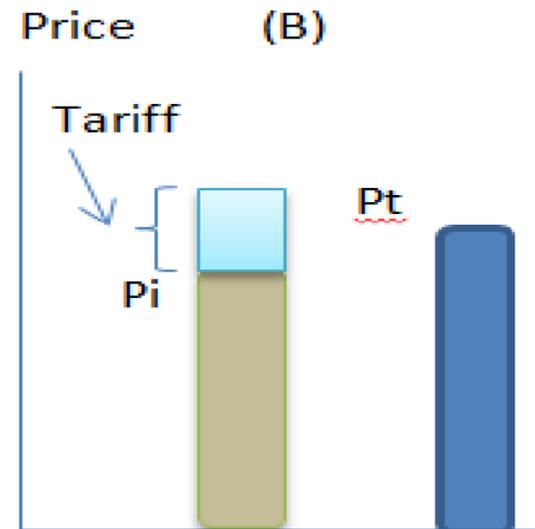




Market Situation

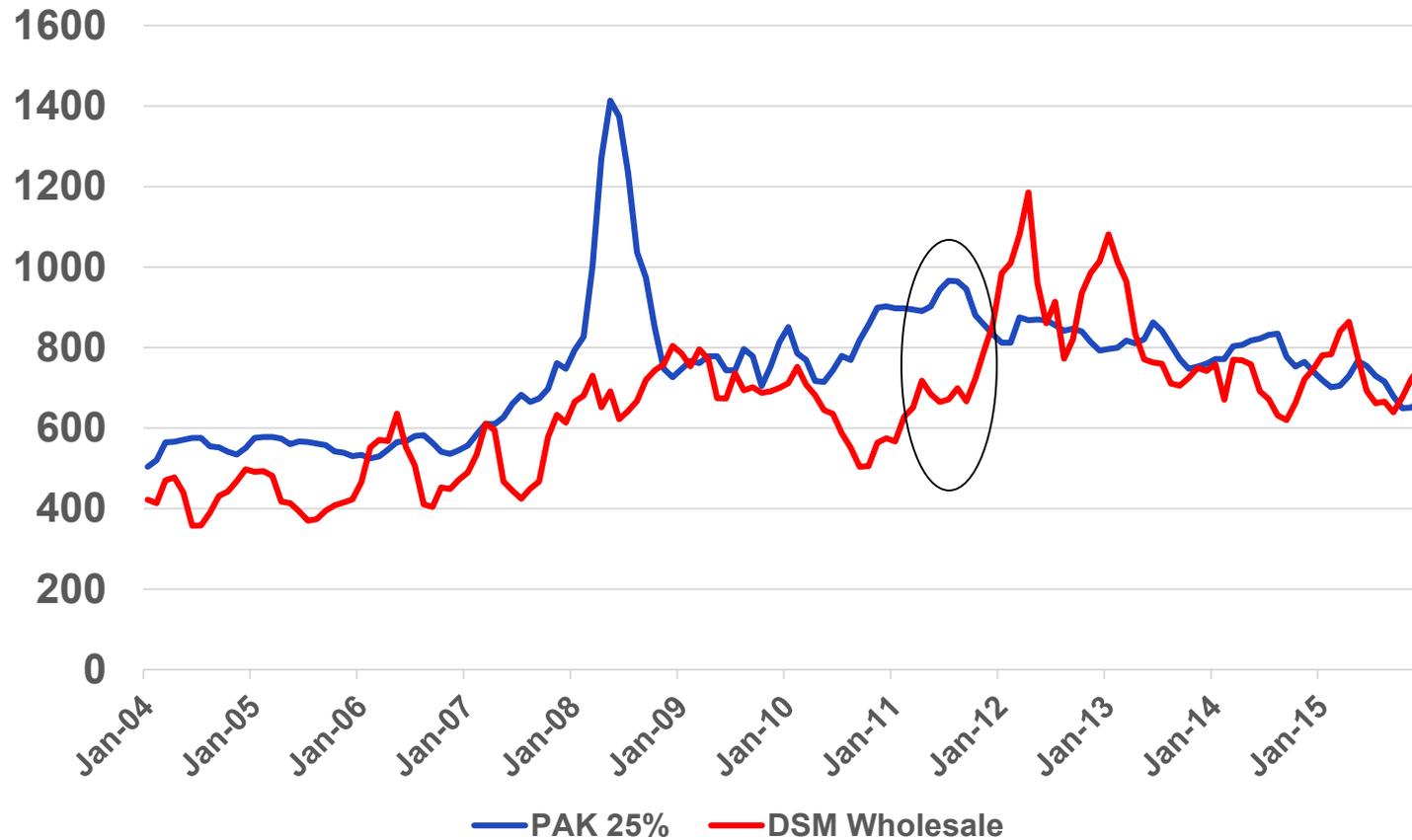
Case B: Price in Tanzania is below the world market import price plus EAC tariff

Private sector cannot import profitably and pay the import tariff. Reduce the tariff to allow profitable import and imports will cap prices in Tanzania.





Pakistan (landed) and Dar es Salaam Rice Price

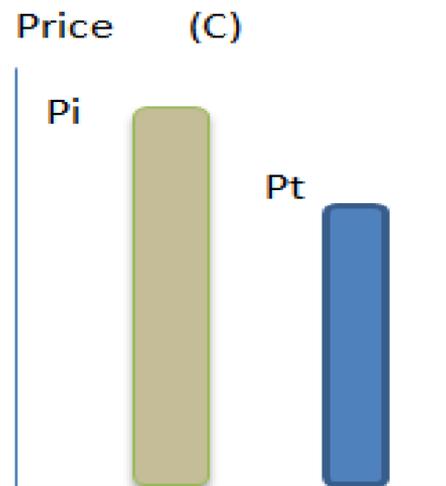




Transparent Rules-Based System of Emergency Food Imports

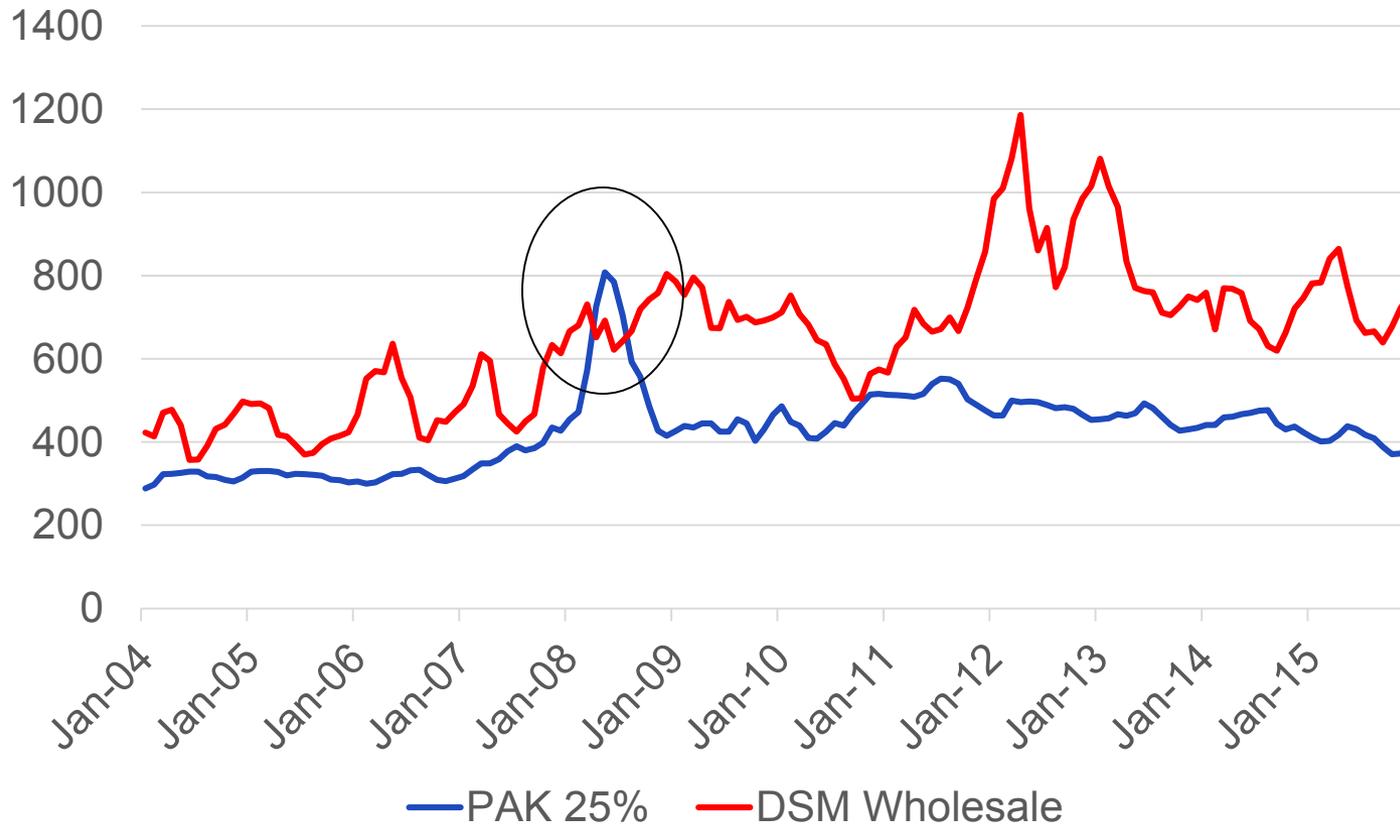
Case C: Price in Tanzania is below the world market import price without EAC tariff

Private sector cannot import profitably even with zero tariff (extreme case). Reduce tariff to zero and appeal to International community.





Pakistan (landed) and Dar es Salaam Rice Price (\$/ton ex-tariff)





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Global Food Crisis

- Use strategic food reserves
- Reduce tariff on other food crops (wheat)
- Rely on Donors and International Organizations for support (World Bank/IMF)



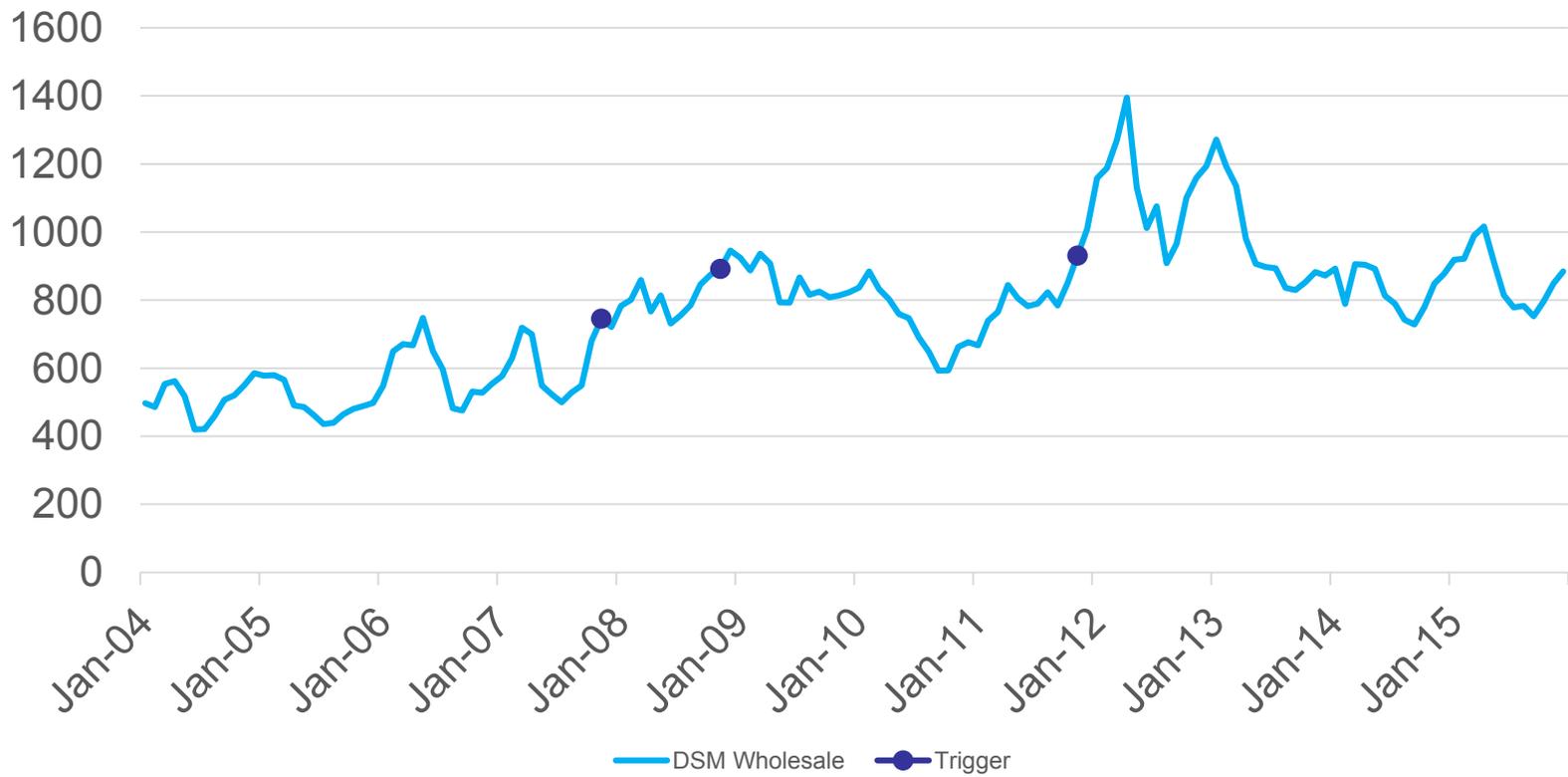
Government Regulated Import Policy

Quantitative controls to limit imports instead of tariff

- Government authorize imports only when needed and determines quantity to import and tariff
- Better monitoring of domestic demand and global/regional markets needed
- Reduce tariff only if needed to provide incentives to private sector
- Control illegal imports through major ports



Price Trigger – example (Sep-Nov/Jan-Aug)





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EAC Approval for Stay of EAC Tariff

- EAC Common External Tariff on Rice is 75%
- Country can apply for a Stay under the Duty Remission Scheme
- Must be approved by Council of Ministers
- Approval normally granted for one year renewable



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Next Steps

- Decide on an import policy
- Strengthen monitoring and analysis
- Get EAC approval
- Implement the policy
- Inform private sector of rules



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TANZANIA

Asante Sana



UNITED REPUBLIC OF TANZANIA



MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES

Establishment of The Agricultural Marketing Intelligence Unit (MIU) at MALF

*Final Report
August 2016*

Prepared By



Acknowledgement

First and foremost, we would like to appreciate the Government's decision to improve the country's system of gathering, analyzing and sharing of agricultural commodity markets intelligence so that stakeholders along the various commodity value chains can make the right business and policy decisions. It reflects commitment to transform and commercialize the agriculture sector while improving the welfare of both producers and consumers in the country.

We are grateful to the guidance and support provided by the Permanent Secretaries and Senior Officials of the Ministry of Agriculture, Livestock and Fisheries (MALF), Ministry of Industries, Trade and Investment (MITI) and the Office of the President, Regional Administration and Local Government (PO-RALG) in Dar-es-salaam, Mtwara, Arusha, Kilimanjaro, Mwanza, Njombe, Iringa and Mbeya. Allow to us to specifically thank the Director of Policy and Planning - Ms Simkanga at MALF who dedicatedly chaired a number of technical meetings during the course of undertaking this study.

While in the regions, we had the benefit of getting views and insights from Chief Executive Officers and senior officers of organizations including the Cooperative sector, Crop Marketing Boards and Chambers of Commerce, Trade and Agriculture. We also held interviews with commodity aggregators, traders, and processors in the sampled regions we visited. We would also wish to thank former officials of the Marketing Development Bureau (MDB) who shared their personal views on the historical role of MDB and the required improvements to the current AgMIS.

The team would also wish to acknowledge and appreciate the financial support provided by SERA project, and more specifically the technical support volunteered by Marialyce Mutchler, Alex Mkindi and David Nyange.

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LIST OF ACRONYM

MITI	Ministry of Industries, Trade and Investment
PO-RALG	President's Office, Regional Administration and Local Government
MDB	Marketing Development Bureau
AgMIS	Agricultural Marketing Information System
MIU	Marketing Intelligence Unit
NFRA	National Food Reserve Agency
NAFCO	National Agricultural Farms Corporation
NMC	Milling Corporation
NARCO	Ranching Corporation
GAPEX	General Agricultural Produce Export
AMSDP	Agricultural Marketing Systems Development Programme
LMDP	Marketing Development Programme
TADB	Agricultural Development Bank
NBS	Bureau of Statistics
CPI	Consumer Price Index
TMA	Tanzania Meteorological Agency
MITM	Ministry of Industry Trade and Marketing
DPP	Division of Policy and Planning
JICA	Japan International Cooperation Agency
DALDO	District Agricultural and Livestock Development Officers
UNDP	United Nations Development Program
ESRF	Economic and Social Research Foundation
ARDS	Agricultural Root Data System
MIS	Management Information System
MIVRAF	Marketing Infrastructure Value Addition & Rural Finance Support Programme
ICT	Information and communication technologies
LGA	Local Government Authority
ACE	Commodity Exchanges
ASDP	Agricultural Sector Development Programme
TFDA	Tanzania Food and Drug Authority
KNCU	Kilimanjaro Native Cooperative Union
MoU	Memorandum of understanding
MTEF	Medium Term Expenditure Framework
DADP	District Agricultural Development Plans
FAO	Food and Agriculture Organization
PE	Public Expenditure
OC	Other Charges
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
FEWS Nets	Famine Early Warning Systems Network
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
TAHA	Tanzania Horticulture Association:
TFA	Tanganyika Farmers Association
MDAs	Ministries, Departments and Agencies
REPOA	Research in Poverty Alleviation
PASS	Private Agricultural Sector Support
WABISOCO	Chama cha Wafanya biashara Soko kuu Mtwara
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TANESCO	Tanzania Electric Supply Company
MVIWATA	Mtandao wa Vikundi vya Wakulima Tanzania

RLDC Rural Livelihood Development Company

Executive Summary

Like many other developing countries, Tanzania has consistently strived to establish a rule-based and transparent agricultural marketing information system with the multiple objectives of enhancing and optimizing producer-incomes, farm productivity and at the same time protecting consumers. This has been done through a formal agricultural marketing information system (AgMIS) managed through specialized agencies, such as was the case with the Marketing Development Bureau (MDB: 1970-mid 2000); dedicated Departments (under the Ministry of Cooperatives and Marketing mid 2000-to 2005); and Sections under a dedicated Department (currently under the MITI).

The scope of the mandated functions of the AgMIS agency/unit has also varied over time; from that of comprehensive production and marketing analysis of all major food and non-food crops for both domestic and export markets (under MDB and Ministry of Cooperatives) to simple market price collection and dissemination of major food crops (under MITI).

Under the current simplified AgMIS, the analysis of production and export markets has been left with other departments, crop boards and NFRA, without a system of a centralized and coordinated pooling of such information for ease of access by various stakeholders including policy and decision makers, analysts, producers, domestic traders and exporters. Consequently, for example, there have been problems in estimating the right amount and right time for allowing importation or exportation of sensitive commodities, leading to price distortions and welfare loss to consumers and producers.

On the basis of the historical performance and the current situation of AgMIS in Tanzania, this report argues for a more coordinated AgMIS in the country; and thus presents a proposal for the establishment of an agricultural Market Intelligence system, initially starting as a Unit (MIU) under the Ministry of Agriculture, Livestock and Fisheries (MALF), and later on graduating to a semi-autonomous agency. The MIU will address challenges of the current AgMIS by providing more comprehensive and holistic information for decision making by producers, domestic traders, aggregators, processors, exporters and the government.

By its mandate and functions, the proposed MIU will have to generate updates on historical, current and forecasted commodity production and price at both domestic and international levels. The proposed MIU, whose legal instruments will be overseen under MALF, will produce regular market updates and policy briefs specific to each priority commodity picked from a list of traditional cash crops (e.g. coffee, tea and cotton); food crops (cereals and pulses); horticultural crops (onions and tomatoes); livestock (beef, poultry, milk, eggs); and fish (e.g. dried and processed fish).

MIU will seek and arrange for collaboration with the other commodity specialized agencies to get reports based on mutually agreed reporting formats. This will include collaboration with the existing agencies engaged in AgMIS. It may be necessary to amend legislations so as to compel some of the agencies to share their information with the established MIU.

The Unit will therefore have a lean but highly competent staff complemented with abilities to synthesize information provided by collaborating agencies; and also undertake their own specialized

surveys and prepare special periodic reports and disseminate to the stakeholders of the AgMIS accordingly.

The financing of MIU will be through ring-fenced allocations from the Department of Agriculture, Department of Livestock, Department of Fisheries, the Commission for Cooperatives, Commodity Boards, National Food Reserve Agency (NFRA), Planning Commission, Bank of Tanzania and the National Bureau of Statistics.

MIU will envisage to start with a few selected crops, advisably those being dealt with by the current agricultural marketing MIS, before embarking on other crops. These will be used to operationalize the MIS at the new MIU and produce the first outputs within the first two years. The estimated costs for the first two years stand at TZS 1,878,062,500 to include personal emoluments and other charges.

PART I: ASSESSMENT OF THE MANAGEMENT OF AGRICULTURAL MARKETING INFORMATION SYSTEM IN TANZANIA

1. Introduction

The increasing complexity in agribusiness activities in both the supply and demand factors in Tanzania necessitates establishment of a Marketing Intelligence Unit (MIU) at the Ministry of Agriculture, Livestock and Fisheries (MALF). This derives from the long-time ongoing government initiatives to link farmers with markets. This document is about establishing the Unit. It is organized in two main parts to include the introduction with background information and rationale for establishing MIU, in Part one; while the second part of the document outlines the mission, structure, functions, financing, expected outputs and legal requirements for establishing the Unit.

1.1 Historical Background

Tanzania's agricultural marketing information system (AgMIS) is traced back to the 1970's before the market was liberalized. The then national Marketing Development Bureau (MDB) was established with financial support from UNDP and FAO¹ to operate within the Department of Planning and Policy of the then Ministry of Agriculture, Livestock and Cooperatives. It was structured to provide AgMIS services during the times of centralized-planning economy (1970-1985); and continued to be active even after the onset of a liberalized market economy in the late 1980s and early 2000.

It should be recalled that the most common reason given for establishing Agricultural Marketing Information System (AgMIS) in Africa is to enhance market transparency in a liberalized economy as from the 1980s². The strength of the former Tanzania's MDB was in providing monthly, seasonal and annual commodity value chain analysis (from production, marketing, processing and exports) to guide parastatals and government in setting producer prices, consumer prices, expected gross margins by farmers, expected export revenues and taxable profits by parastatals. Although the government allowed a parallel marketing system by involving private sector dealers, it was not primarily meant to assist the dealers, though they ended up gaining from the announced prices as spill over benefits.

MDB depended on a network of market information collection centers, managed by government staff, mostly agricultural extension officers and district trade officers. The marketing information, for food and non-food crops, was collected from all the town councils and large markets outside district headquarters and relayed to MDB in the headquarters in Dar es Salaam by phone, telex, fax and radio. Food crops included all cereals (maize, rice, sorghum, and millet), legumes (mostly beans), oilseeds (sunflower, groundnuts and sesame), tubers (sweet potatoes and irish potatoes), horticultural crops (tomatoes and onions) and plantain/banana. Non-food crops (termed as cash crops) included coffee, tea, tobacco, and

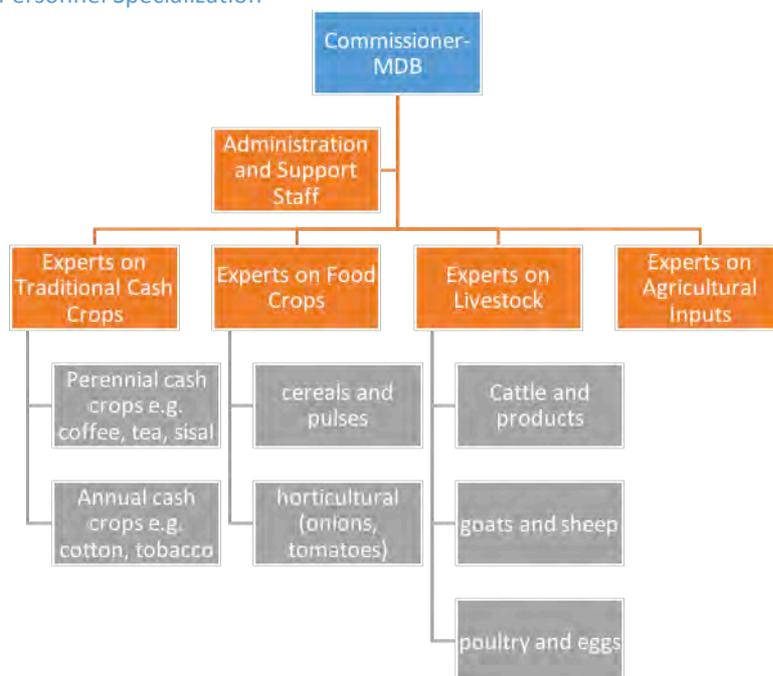
¹ Magesa, M et.al. (2014). Mawazo, Kisangiri Michael and Jesuk Ko (2014). "Agricultural Market Information Services in Developing Countries: A Review", In ACSIJ Advances in Computer Science: An International Journal, Vol. 3, Issue 3, No.9, May 2014

² Magesa, M. et.al. (2014). Op.cit.

pyrethrum. The system was also reporting on prices of different grades of cattle, sheep, goats and meat from different livestock auction markets.

The staff at MDB were organized in commodity specialized teams of experts who also undertook the following tasks: (a) collating daily/weekly commodity market prices from different parts of the country (b) research on domestic and international commodity markets (c) commodity price and production trend analysis and forecasts (d) prepare policy briefs for the Minister.

Figure 1: MDB's Personnel Specialization



Special value chain analytical reports were prepared for each commodity, covering information on production area, itemized production costs under different technology intensity scenarios (i.e. low, medium and high), productivity levels, quantities produced, producer prices, packaging costs, storage costs, transport costs, processing costs, and market markup prices for domestic and international markets. The analysis included trend in production in response to spatial and temporal price movements; price dispersion and convergence as well as visual display of territorial movement of commodities from surplus to deficit areas. The Bureau had a capacity building programme funded by FAO to empower its staff with analytical skills; and also conducted regular trainings of grass roots personnel engaged in data collection and annual commodity surveys.

Views on the “old good days” of the defunct Marketing Development Bureau have been given by the current staff of the Ministry of Agriculture, Livestock and Fisheries; Regional Secretariat Officials in Mwanza and Mbeya; and former officials of MDB (now in retirement). The Bureau provided critical information for planning during the era of centrally planned economy, when the government and some of its statutory bodies were actively engaged in production (in agriculture and mining), value addition, marketing, services (hotels and banking) and export/import trade. MDB was tasked to recommend ideal farm gate prices for different commodities, including estimation of forecasted production levels based on market and price conditions. It therefore conducted surveys to determine production costs under different scenarios of applied technologies, transport costs and processing costs; and compared the

costs/prices with international market conditions. Interestingly, MDB gathered information on private sector market operations and used that as a benchmark to recommend competitive price levels that government or its parastatals could pay to compete with private sector buyers or sellers. Its funding was through normal government allocations, which was boosted by a grant from FAO. Occasionally, other development partners funded development projects initiated by the bureau.

MDB started showing operational weaknesses in the early 2000s due to inadequate funding and reduced staff strength such that a regional network - FoodNet intervened in 2002 by seconding an external expert to assist the Bureau to undertake its functions³. However, with the onset of market liberalization and arguments for enhanced role of the private sector, justification of the existence of the MDB was weakened. Eventually, agricultural marketing data responsibilities were transferred to the then Ministry of Industry and Trade, which was renamed as Ministry of Industry, Trade and Marketing (MITM). Since then, data on prices of agribusiness products are compiled by the ministry. The historical functions of Agricultural Marketing Information System appear to have undergone four stages of institutional positioning within the ministries: first managed under a semi-autonomous “Bureau” (1970-1990s) under Ministry of Agriculture, then as a “Unit” under the same ministry (1990s-2000s); then as a “Department” (2000s) under the Ministry of Cooperatives (located to Dodoma); then as a “Unit” in the Ministry of Industry (MITI).

1.2 Objectives of the Report

The objective of this report is to assess the situation of the agricultural marketing information system in Tanzania with a view of establishing an Agricultural Marketing Intelligence Unit (MIU). More specifically, the report seeks to review the previous and existing Agricultural Marketing Information Systems (MIS) as a basis for setting up a new and improved MIU in Tanzania; and thereof propose organization structure for the unit, its priority functions, its relationship with other data-collecting institutions, human resource and staffing levels, capacity building needs, sources of financing, work plan and at least a two-year financial budget for the unit.

1.3 Methodology

The preparation of this report involved desk reviews, visits and face-to-face interviews and meetings with key personnel from the various stakeholder institutions of the agricultural sector in Tanzania and consultations with the DPP Office of the Ministry of Agriculture, Livestock and Fisheries. The interviews and discussions focused on the current situation of the agricultural marketing information in Tanzania and possibility of establishing a new MIU including what ought to be its structure, functions, networking, etc. The list of the people and institutions visited and interviewed is provided as Appendix 2 of this report.

In addition, literature review on agricultural MIS in other countries was carried out to enrich this report particularly on the establishment of MIU in Tanzania. The internet-based literature has been very useful source of information and experiences with agricultural marketing information systems.

Preparation of this report involved a team of three consultants under Diligent Consulting Ltd. The report has two main parts in which the first gives the historical and contextual background of the report

³ Ferris, Shaun and Peter Robbins (2004). “Developing Market Information Services in Eastern Africa. The Foodnet Experience. In ASARECA Monogram 9. May 2004. (pg.8).

including a situation analysis of the current agricultural MIS in Tanzania. The second part is the layout of the proposed MIU, which includes work plan and financial budget for the first two years of the unit.

2. Situation Analysis of Agricultural Market Information System in Tanzania

The adoption of economic management largely guided by market forces since the mid-1980s led to governments withdraw from direct participation in production, value addition, storage, distribution and trading of agricultural commodities, and confined itself to strategic policy guidance. This “hands off” by government meant that it ceased to get reliably collected information on levels of commodity production, bulking and marketing information which was previously generated through operations of parastatals such as National Agricultural Farms Corporation (NAFCO), National Milling Corporation (NMC), National Ranching Corporation (NARCO) and General Agricultural Produce Export Company (GAPEX). However, the establishment of National Food Reserves Agency (NFRA) in the 2000s afforded the government to have some clues on levels of food stocks in the country since the agency had some business dealings with private sector large scale traders, warehouse owners, and millers. In order to address inherent weaknesses in the productive sector, the government continued to support farmers, livestock keepers and fisher folks through capacity building programmes such as Agricultural Marketing Systems Development Programme (AMSDP) and Livestock Marketing Development Programme (LMDP).

On the other hand, although the government stopped owning cash crop farms, it continued to be indirectly engaged in promoting the production and marketing of some selected crops such as cashew nuts, cotton, coffee, tea, sisal, tobacco, and horticultural crops, through Commodity Marketing Boards; and in facilitating agricultural finance, first through an agricultural window at the Tanzania Investment Bank (TIB) and more recently the Tanzania Agricultural Development Bank (TADB).

The implication of the rural functional structure above meant that reliable information on levels of commodity production and the ruling market prices (farm gate, intermediate and final consumer prices) is under the custody of various commodity boards, cooperative societies, traders and government departments whose functions demand to have such information.

The then Ministry of Industries, Trade and Marketing inherited a scaled down MIS engaged in collecting and disseminating domestic market wholesale and retail prices for food crops and livestock from major markets in the country. The ministry has continued to perform the function by relying mostly on personnel based in the district councils. However, there have been some improvements in terms of relaying raw data from the districts to the headquarters in Dar es Salaam due to the use of emails and mobile phones; and in terms of disseminating reports to the public through websites, mobile phones, television, etc. The Ministry produces monthly reports on livestock market conditions and prices using information collected from 53 LGAs and MAFC operated markets. The government, however, has access to other agricultural sector information systems, which are dedicated to collecting thematic data as shown later in this report. It includes reports of the National Bureau of Statistics (NBS) on Consumer Price Index (CPI) (based on retail prices of 244 commodities), biannual national panel survey on livelihoods (including income, expenditure and diet), five yearly reports of National Sample Survey of Agriculture and Household Budget Survey. The Ministry of Agriculture, Livestock and Fisheries also produces quarterly/annual reports on levels of production, market conditions, food security assessment, crop and livestock health. On the other hand, the Tanzania Meteorological Agency (TMA) releases data on weather conditions and forecasts after every 30 minutes and produces a special report on agricultural weather after every ten days.

2.1 The structure of the current agricultural MIS in Tanzania

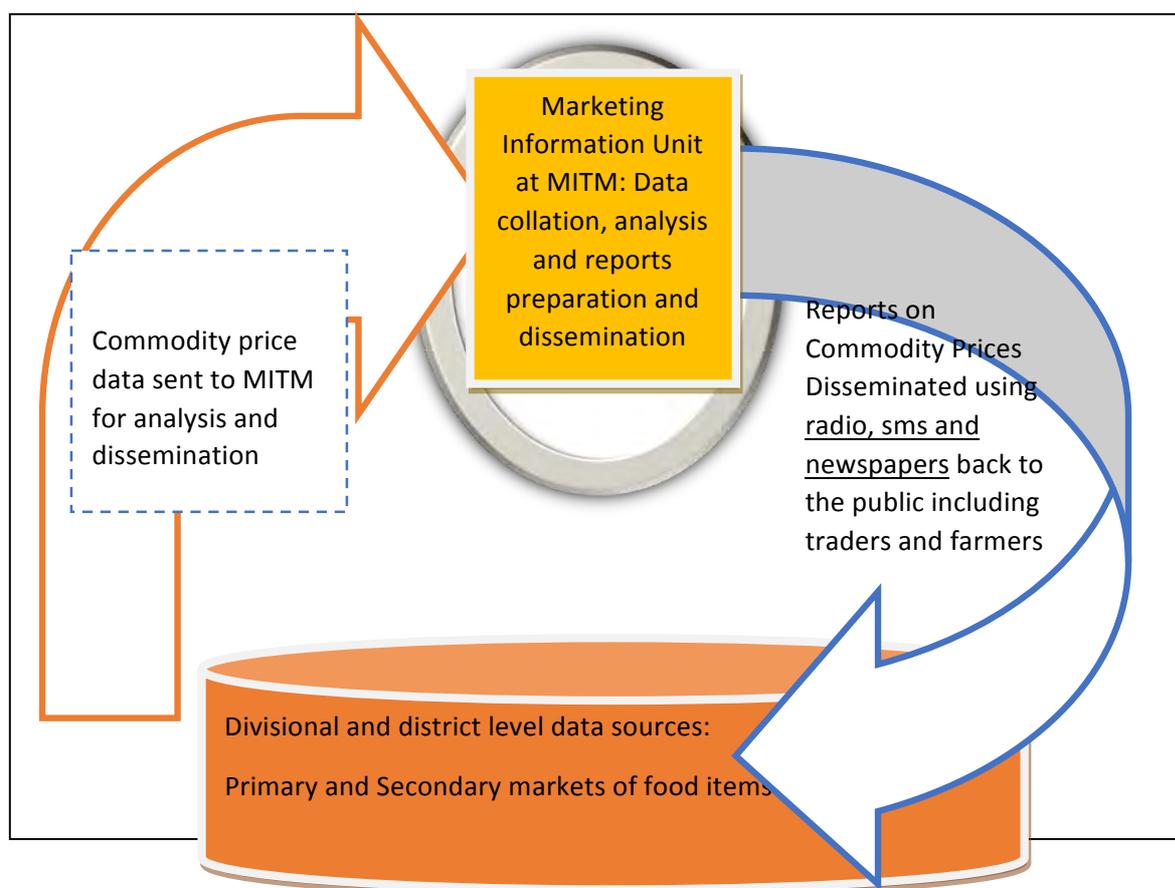
Until the first half of the 2016, the Marketing Unit at the MITM was the custodian of the official AgMIS whose functional structure included a network of data collectors and reporters based in the districts under the Local Government Authorities in the Department of Trade (Trade officers) who worked closely with staff from the Department of Agriculture and Livestock Production. The information collected has two categories: commodity prices (showing selling and buying retail and wholesale prices) collected from ward and district-based markets, and relayed three times a week directly to the Marketing Unit at MITM. The second category is information collected and reports prepared on a monthly and quarterly basis. These reports cover data and information on commodity prices to include crop area, estimated productivity and production levels, livestock numbers and yields and number of auctioned livestock.



Figure 2 Organogram under which Marketing Information is located at MITI (2016)⁴

Among the Departments in the Ministry of Industries, Trade and Marketing (now renamed as Ministry of Industries, Trade and Investment (MITI)), is the Department of Trade Promotion and Marketing, under which falls the Marketing Research, Information and Promotion Section. This section has three units responsible for Marketing Research, Information Collection and Dissemination, and Market Promotion.

⁴ Source: diagram created based on text given under www.mit.go.tz



2.2 Multiplicity of data collection institutions/units

As mentioned earlier, the country has parallel systems of agricultural sector information collection; some are based within the ministries and some operate under dedicated national-based systems. The different entities engaged in agri-data collection have their own justification for doing so based on their mandate, which they believe could be jeopardized if they relied on third parties, mainly because of timing of delivery of such information, and also details of the contents.

Within MALF for example, the Division⁵ of Policy and Planning (DPP) has its own Statistics Unit, which also gathers and analyses information. At the same time, the Division of Livestock Production, Division of Crop Production and Division of Fisheries also have dedicated systems for collecting and reporting on production, weather conditions, technology application in production process (use of inputs), productivity, estimated surpluses, projected food availability, etc.

At the same time, the Directorate of Food Security in collaboration with the NFRA, has a parallel system which collects data on food crops for estimation of food security status using a combination of about ten data-collection tools for monitoring ten major food crops at various levels of crop growth, pests-attacks, rainfall and temperature, movement of crop prices at the LGA level and food availability in the districts. Such information is also collected by the National Bureau of Statistics. Cooperative Unions also have

⁵ Until recently when under separate ministries referred to as Directorate (Department)

their own systems to monitor production levels and price movements to allow them to properly plan and prepare for the coming crop marketing season. MVIWATA and RLDC prepared a joint system of collecting prices of crops in special market centres. Besides, private sector agencies with some elaborate data collection system include the Tanzania Horticultural Association (TAHA) which has a system for real-time marketing information sharing system for marketed horticultural produce; and the recently established Eastern Africa Grain Growers Association. Thus, the current AgMIS is too much fragmented without central coordination for auditing and validation of the information collected. There are also some pilot projects to link rural based producers with urban traders managed by other institutions such as Kariakoo Markets Corporation (supported by Vodacom) and the Economic and Social Research Foundation (ESRF) (supported by UNDP/Planning Commission). The project by ESRF is an attempt to link groups of producers or aggregators with some identified stocks of commodities place in a known place, with interested buyers who can also negotiate prices online before payment and transporting the goods.

There have been some attempts to unify and harmonise agri-data collection; the most recent being the JICA-funded Agricultural Root Data System (ARDS) with technical support provided by the University of Dar es Salaam Computing Centre. The ARDS entails an extension officer at the village level who collects data, assisted by GPS gadgets for location precision, manually fills a data sheet, sends it for data aggregation at the Ward level (also done manually). The data sheets are then sent to the District Agricultural Officer who digitally makes a district report before posting it on the Ministry's website portal. The web portal can be accessed even by using a smart phone. This approach has simplified the process of sharing information on food security. There is still a room to improve the system if the information could also be computerised at the village level instead of entering manually. This could allow agriculture officers at the village level to enter the data and post it on the web portal. There are also challenges in capacitating the village-level extension officers with some equipment and gadgets for collecting weather and rainfall data, and transport facilities such as motorbikes to make them smoothly mobile during data collection.

2.3 The functioning of the current agricultural MIS at the MITI

The Marketing Information Unit at MITI (until recently MITM) is responsible for collecting agricultural marketing data from all over the country, collating it and disseminating through different mass media outlets: radio, newspapers, mobile phone (sms alerts) and website. It uses its staff located at district levels, and some borrowed LGA's agricultural extension staff. According to market information posted by MITM⁶ in May 2016, prices are gathered from 20 markets and cover eight commodities as shown in Table 1.

Table 1: Type of Commodities whose price information is collected by the current MIS at MITI

Commodities covered and reported	Market locations	Prices reported
<p><u>Cereals</u>: Maize, Rice, Millet, Bulrush millet, finger millet, wheat</p> <p><u>Pulses</u>: Beans</p> <p><u>Tubers</u>: round potatoes (Irish)</p>	<p>Arusha, Babati, Dodoma, Singida, Geita, Mwanza, Shinyanga, Kigoma, Ilala, Temeke, Moshi, Tanga, Mpanda, Tabora, Sumbawanga, Njombe, Iringa, Mbeya, Songea, Lindi</p>	<p>Range of minimum and maximum wholesale prices for each of the commodities</p>

Source: information posted on 27th May 2016 on www.mit.go.tz/pages/crop-prices

⁶ www.mit.go.tz/pages/crop-price posted on 27th May 2016 and accessed on 13th June 2016

The collection of price data is undertaken by a network of grassroots extension officers who normally move around fixed statutory markets and rotational weekly crop and livestock markets undertaken at ward levels (“magulio” in Kiswahili). They compile such information and compile it in data collection forms which are taken to the district officers, who in turn prepare a summary sheet for the district before sending them to MITM (now MITI) in Dar es salaam. The information is delivered to Dar es salaam headquarters using conventional means such as faxes, emails and radio calls, which are less advanced than those used by the JICA-funded ARDS for monitoring food security. However, once the information is collated in Dar es salaam it is posted on the MITI’s website (www.mit.go.tz/pages/crop-price).

Among the existing parallel food price data collection system, which is worth emulating is that pioneered by the East Africa Grain Council, which has installed a system for real time collection of rice prices at major marketing points and warehouses. It uses blue-tooth fitted weighing machines that relay information on received quantities of rice stored in warehouses. This allows the Council to have a national picture of stocks of rice and their locations, which makes it easier to link buyers with sellers. The system is linked to district-based commodity aggregators (private sector companies, cooperative unions, and producer associations) who manage such warehouses.

2.4 Merits of the current AgMIS

The current AgMIS is able to provide an overall picture of movement of key food commodities three times a week. The information is instantly available by prompting using simple mobile phones for those who cannot open the ministry’s website and may have missed radio news bulletins or newspaper articles. Traders interviewed in Dar es Salaam, Mwanza, Mtwara, Arusha, Morogoro and Mbeya confessed that they regularly got such information from radio programmes and some of them have been trained on how to prompt for price data using their mobile phones. Despite of some misgivings, they gave some accounts of traders from other regions who brought their merchandise to their markets places on the strength of information they got from MITI’s market price radio bulletins.

The information has also been useful in guiding the government on key decision with regard to the NFRA activities, import/export decisions. Among the financial institutions which confessed to benefit from the current AgMIS is the TADB, which depended on MITI for Data on Commodity Markets.

One of the successes of the existing Marketing Policy has been the enforcement of the use of standard weights and measures for agricultural commodities. Measurement of produce is to some extent now harmonized because of the use of weighing machines, especially for rice and beans. This has also amplified the comprehension by traders when they get information on prevailing market prices per kilogram in other towns because they now also use weighing machines instead of bags.

2.5 Demerits of the current Agricultural MIS

The current Ag MIS as operated by MITI does not provide adequate intelligence on market conditions for the covered commodities since it omits critical information on production levels, surpluses or stocks held in the country, and overseas market conditions. Moreover, the scope of commodity coverage is confined to major food crops only and does not cover other non-food crops, which are equally important in providing a holistic picture on competition between cash and non-cash crops, which usually determines livelihoods of farmers and therefore guide their farm-level decisions on resource allocations.

There is also a problem in the quality of data. The current dataset has plenty of gaps and inconsistencies such that it is difficult to construct a plausible time series trend. There are two factors that play against getting quality and consistent datasets: The first is lack of adequate financial resources that would provide adequate working equipment for field staff to easily access markets and efficiently disseminate the collected information; and the second is shortage of manpower, most of whom are not directly accountable to MITM.

Although it is acknowledged that price information is well disseminated; its usefulness to farmers and traders is regarded as “limited” due to the time lag between the reported price and getting the information by traders (more or less regarded as historical data) and lack of forward looking perspectives. Informants in Dar es Salaam, Mwanza and Mbeya gave accounts of how some district-based traders make decisions to bring their commodities to the three cities lured by the announced historical prices, only to face a different but lower price level after two or three days because prices change every day; and there is a thin line between wholesale and retail prices.

Lack of a system to link the market price and data on stored stocks in warehouses and homes, for sensitive commodities such as sugar and rice, has resulted in misleading import and export policy decisions, leading to market gluts (when misguided to order imports as was the case of rice in 2014/15) or shortages (when misguided to prevent imports as was the case in 2016).

Some farmers still prefer measures based on traditional scales such as tins and bags. For example, traders in Mbeya thought that one of the impediments in adopting standard weights and measures by producers and traders is the mistrust of middlemen (in Kiswahili “madalali” or “walanguzi”) who are known for fiddling with weighing scales such that illiterate farmers still prefer measures of tins and bags which they can visually comprehend.

The information gathered by the current AgMIS at MITI is limited to buying and selling prices (wholesale and retail) at secondary market levels (large markets, mostly at district level) and excludes divisional and ward level prices. Also, it doesn't include farm gate prices. The current system also does not collect information on production costs; and so there is no analysis of gross margins based on the prevailing market prices.

3. Experiences of Agricultural MIS and MIU from Other Countries

Arbitrarily, this report selects seven countries as case studies to draw lessons with regard to management of AgMIS. The countries include India, Uganda, Zambia, Ethiopia, Mali and Mozambique, Niger, and England. Each of these cases presents experiences with AgMIS in the context of establishing MIU in Tanzania.

3.1 Lessons from India

India enjoys the services of two parallel systems for agricultural marketing information. The first one is what is known as “Agricultural Marketing Information System Network” which ensures the functioning of good marketing strategies for agricultural commodities so that farmers can obtain remunerative prices through correct and timely agricultural products market information. The second system is a network of research and high learning institutions which runs what is called “Network Project on Market Intelligence”.

(a) India's Agricultural Marketing Information System Network:

The Directorate of Marketing and Inspection (DMI) under Department of Agriculture and Cooperation implements the scheme and manages the network. The main tenets of the network are to facilitate collection and dissemination of information to support the realization of better prices and covers: a) market related information, such as market fee, market charges, costs, method of sale, payment, handling, market functionaries, development programs, market laws, dispute settlement mechanism, composition of market committees, and income and expenditure; b) price-related information, such as minimum, maximum and model prices of varieties and qualities transacted, total arrivals and dispatches with destination, and marketing costs and margins; c) infrastructure related information comprising facilities and services available to the farmers with regard to storage and warehousing, cold storage, direct markets, grading, and re-handling and repacking; and d) promotion related information covering accepted standards and grades, labelling, sanitary and phyto-sanitary requirements, pledge finance, marketing credit, and new opportunities available in respect of better marketing.

The network has also the responsibility to (a) sensitize and orient farmers to respond to new challenges in agricultural marketing by using information and communication technologies (ICT) as a vehicle of extension; (b) improve efficiency in agricultural marketing through regular training and extension for region-specific farmers in their own language; and (c) provide assistance for marketing research to generate marketing information for its dissemination to farmers and other marketing functionaries at grassroots level to create an ambience of good marketing practices in the country⁷.

Among the major concerns the Indian MIS had to take into account during the design stages and during its operational include the (a) the need to build the capacity of the counterpart organizations to effectively play their role (b) getting adequate levels of resources for research for the MIS to prove valuable to its target users (c) flexibility to tailor the size and scope of the services to the available budgetary resources so that there is continuity of the most crucial information needed by stakeholders (d) ensuring that all operatives are fully trained so that MIS is as accurate as possible (e) ensuring that the planning of MIS takes into account key details of how the marketing system works. This requires a detailed baseline survey of the marketing system in order to assess information requirements of each category of participant in the system⁸.

The experience from India also shows that: (a) MIS can also help develop different type of marketing channels as a result of increased market transparency; (b) MIS could conveniently be built using information and communication technologies (ICT) to tap from marketing information systems hosted by other stakeholders, although it may be necessary to have some precautionary measures for quality and accuracy control; (c) farmers are interested in forecast information in addition to prevailing price situation for different varieties. This implies that the need to decide, at an early stage, on the crops to be covered, the names of varieties which are to be reported on because in many cases there will be

⁷ Other equally important information to stakeholders besides buying and selling prices are post-harvest and processing technologies, new markets and buyers, requirements of the buyers and quality control, best practices in production, and policy issues; which are critical in enterprise development and improved marketing of agriculture products

⁸ These include farmers, traders and commission agents, exporters, retailers, consumers, extension services and government departments who in essence have specific data and information needs (and frequency) for the decision-making processes.

significant differences between prices for different varieties⁹; (d) start on a small scale in terms of number of commodities and number of markets covered, and work up as resources permit bearing in mind that more markets implies more data to handle, more staff required and a heavier recurrent cost.

(b) India's "Project on Market Intelligence"

The network, coordinated by the National Centre for Agricultural Economics, has two major objectives (a) to provide short term price forecasts to farmers for selected commodities; and (b) to conduct regional case studies on price movements, marketing infrastructure, and farmers' decision making processes. It regards marketing intelligence as "the process of collecting relevant information related to the existing market prices, domestic and global agricultural supply and demand conditions, policy environment and other relevant factors; converting those into usable form through scientific modelling and stakeholders' perceptions; and disseminating through effective means so that informed and effective decisions can be taken by the farmers and other stakeholders". The network, consisting of more than seven (7) institutions each specializing on a few out of priority commodities, which include maize, potatoes, paddy, millet, groundnuts, coconuts, onion, turmeric, and cotton. The reports provide information on pre-sowing, pre-harvest and post-harvest price forecast. The Marketing Intelligence Units for commodities can be traced back as far as 1954 when each of the 14 state capitals had its own MIU. The research focuses on commodity value chain analysis, market behaviour and farmers' responses such that it publishes reports related to (a) commodities price behaviour and farmers' responses (b) estimation of marketing efficiency of high value horticultural commodities under different supply chains (c) effects of government policies and market interventions on price patterns (d) price trend and co-integration of commodity prices (e) market integration and price volatility, and (f) supply behaviour and price transmission and forecasting.

Two lessons from India:

(a) the need for government to have a lean secretariat for marketing information system management; (b) build a strong network of specialised agencies whose tasks are to gather marketing intelligence for specific commodities and relay that information to government and other stakeholders.

3.2 Lessons from Uganda

A review of the Uganda's AgMIS in 2004¹⁰ indicated that agricultural markets in the country were characterized by, among other things, small-scale traders who could improve their income if they had better means of communication with market centers; and the then existing MIS were inadequate and did not help in the day-to-day problem of making commercial transactions in agricultural goods. As a result, the review concluded that data requirements differ according to the type of stakeholders as presented in Table 2.

⁹ This could be tied to extension agents resolve to promote a particular variety of crop (e.g. Kyela rice or Magugu rice) so that more farmers can be interested to cultivated or consumers interested to buy and consume.

¹⁰ Ferris, Shaun and Peter Robbins (2004), page 17.

Table 2: Data requirements by type of stakeholder in the AgMIS

SN	MIS Stakeholder	Level of Importance attached to type of information generated by MIS Key: H ² =very high; H=high; H ^e =high but available from other international sources; M=medium; L=Low					
		Price	Volume traded	Future supply/demand	Quality	Transport costs/tariffs	Location and mode of data dissemination
1	International trader	H ^e	M	H ^e	H	H	L
2	Regional traders/Millers	H	H	H ²	H	H ²	M
3	Informal exporters ¹	M	M	H ²	M	H	M
4	Urban Trader/Large or Commercial farmer	H ^e	H ²	H ²	M	H	M
5	Village Trader/ Farmer groups	H	H	M	L	M	M
6	Small farmer	H	H	M	L	L	M

Note: ¹ avoids paying duties

Source: Ferris, Shaun and Peter Robbins (2004): summarized information from Table 1, pg.8

Clearly, the table shows importance of information on prices and volume traded to farmers regardless of whether they are small, medium or large.

The experience of Uganda shows that donor-funded MIS tend to fail and usually fall back to basic operations serving a very narrow constituency of government departments within the parent ministry at the expense of the intended primary beneficiaries, namely producers and traders. This compromises sustainability of the AgMIS. Nevertheless, Uganda's MIS was designed bearing in mind the geographical coverage, mode of communication between districts and the headquarters, an all-inclusive network of stakeholders to collaborate in managing MIS (e.g. farmer groups, traders, organized market places, crop boards, etc.); and the importance of linking and having effective communication between national level and LGA MIS. The Ugandan MIS had an M&E system designed to monitor if the MIS ultimately offered any benefits to farmers (e.g. increased farm income and volumes of trade) and consumers (e.g. lowering of consumer prices)¹¹.

3.3 Lessons from England and some other African Countries

Similar findings are reported by Magesa et.al. (2014)¹² citing experiences of Niger where access of information through mobile phones reduced agricultural price dispersion across markets by ten percent; and in Ethiopia where price awareness helped smoothen flow of grains from surplus to deficit areas, and thus reducing food shortages and lowering consumer prices in the destination areas.

In England, where most of the farming operations, aggregation, processing and marketing are undertaken by the private sector, Agricultural Universities are given resources by government and the banking sector (as part of the corporate social responsibility), to conduct annual surveys on key commodities such as wheat, beetroot, milk and beef; and prepare reports detailing cost elements along the value chain of each commodity and expected gross margins based on three levels of technology: low, medium and high intensity. The then Wye College of the University of London, used to cover, until early 2000's South East England and produced farm booklets with details of agricultural business data

¹¹ Ferris et.al (2004: 21). Op.cit.

¹² Magesa, Mawazo, Kisangiri Michael and Jesuk Ko (2014): pg.41

and information; markets analysis, price trends, etc. The main lesson from England is that when the banking sector is actively engaged in the sector it automatically takes as part of its responsibility to support the government and farmers/traders in gathering marketing intelligence. The information collected by Wye College was very instrumental in negotiation to design an acceptable EU Agricultural Policy and in defending the interests of EU farmers against dumped imports from the United States of America.

There are also rich examples from other African countries where farmer organizations (such as Observatoire du Marché Agricole (OMA) in Mali, Economic Information System of Vegetables in Madagascar, and ZNFU in Zambia); and commercial private sector (such as Esoko based in Ghana and active in 16 countries, Infotrade in Uganda) have organized to have their own MIS. Among the strong and emerging MIS is that operated by Agricultural Commodity Exchanges (ACE) gradually being established since 2004. They include Malawi Agricultural Commodity Exchange (MACE, 2004), Zimbabwe Agricultural Commodity Exchange (ZIMACE, 2008), Ethiopia Commodity Exchange (ECX, 2008), and Zambia Agricultural Commodities Exchange (ZAMACE, 2007) and the Kenya Agricultural Commodity Exchange (KACE). Commodity exchanges facilitate market transparency and price discovery through centralizing trade in certain commodities. This reduces transaction costs associated with identifying market outlets, physically inspecting product quality, and finding buyers or sellers.

Magesa et.al. (op.cit), shows that although use of radio is the most common media for providing marketing information to the public compared to newspapers or mobile phones, the feedback from stakeholders in Zambia, Ethiopia and Lesotho was that prices were broadcasted at wrong times when most traders were in the markets or farmers were in their fields. Radio broadcasts in local language may also benefit many farmers and traders.

Experiences from other countries show that despite the importance of AMIS in providing information to intended users, it is still critically important to conduct some impact assessment studies to determine their usefulness and their benefits to producers and traders¹³. The objective of the impact evaluation of AMIS should be to determine how it has helped to improve market efficiency, lower transaction costs and enhance market integration over time. Importantly, it should be possible to determine the extent to which poor farmers manage to obtain better market access and better producer prices. It is recommended that in order to ensure the AMIS collect and disseminate updated timely information, then “a clear business model that allows for their financial sustainability and scalability need to be thought of”. It is also important to remember that provision of such services in rural areas will highly be influenced by enabling environments such as improved roads, electricity and ICT gadgets for MIS staff.

¹³ Magesa et.al.(op.cit.): pg.44

PART II: PROPOSED ESTABLISHMENT OF MIU IN TANZANIA

4. The Proposed Marketing Intelligence Unit

4.1 Definition and Name of the MIU

Marketing intelligence refers to the everyday information relevant to given markets, gathered and analyzed specifically for the purpose of accurate and confident decision-making in determining market opportunity, market penetration strategy, and market development metrics. Marketing intelligence is also necessary when entering a new market¹⁴. Marketing intelligence determines the intelligence needed, collects it by searching environment and delivers it to marketing managers and policy makers who need it. Marketing intelligence software can be deployed using an on-premises or software as a service model. In order to collect marketing intelligence, marketing officers must be in constant touch and communication with the various stakeholders like traders, customers, distributors and suppliers/farmers. Marketing officers can design reports that correlate and visualize data coming from a variety of sources. This allows them to see current key performance indicators in real time and analyze trends and other issues of interest. The ultimate objective of the Unit will be to promote agribusiness and catalyse the transformation of the agricultural sector. It is expected that the Unit, true to the meaning of “intelligence”, will collect market information beyond Tanzania to cover the regional market (EAC, SADC and COMESA) and the international markets (traditional markets of Europe and America; and new ones in Asia and Middle East. It should also be noted that the Unit will bring together intelligence of commodities that were previously handled by separate ministries now brought together under one ministry dealing with crops, livestock and fisheries (MALF).

4.2 Rationale and Objectives of Establishing Agricultural MIU

The second phase of the Agricultural Sector Development Program (ASDP II) stipulates the need for linking farmers with markets. Component Two of the ASDP II is a national-level support in which Sub-component Three is on Marketing and Private Sector Development. Market-related decisions require up-to-date and on time information and analysis with regard to prices, volumes, marketing environment and the changing conditions in the market.

The effects of climate change are deep-felt, and have made agricultural production more erratic in Tanzania. Meanwhile, food consumption patterns are changing in response to urbanization, emerging middle class and changing demographics in the country. Tanzania is also facing increasing imports of value-added food products; but at the same time new regional markets for staples are opening up. Notably, the emergence of supermarkets and new formal markets has changed urban food products retailing outlets. This depicts a shift from the traditional open air markets.

¹⁴ https://en.wikipedia.org/wiki/Market_intelligence

Reliable market information is the basis of making informed trade policies on agribusiness. MAFC is facing challenges in making informed trade policies due to lack of reliable market information and inadequate market analysis. Although the Marketing Division of the MIT continues to collect and disseminate market information, MAFC has challenges in accessing such information timely; let alone lack of rigorous analysis which MAFC needs in making informed decisions in the sector.

The AgMIS should fully take advantage of technological development in ICT so that up-to-date and reliable market information is efficiently made available to all stakeholders in the agricultural sector. This is in addition to the private sector development in Tanzania which is currently managing limited AgMIS for their respective crops.

Currently, there are several units and departments dealing with AgMIS in isolation. Coordination of the AgMIS in Tanzania is crucially needed to improve its management, harmonization and validity of the information collected. For example, cooperative societies struggle to compile their own market information which is limited and costly to compile. With the establishment of MIU, AgMIS would be more readily available to both the farmers and traders along the crops value chains.

Given that Tanzania has for a long time adopted a liberalized market system it is necessary to have an effective AgMIS because many farmers are unaware of prices and other market conditions even in their nearest town, which puts them in an impossibly vulnerable bargaining position with traders who are able to take advantage of their ignorance. Farmers are also unaware of the types and quality of produce being sought by national, regional, and international customers which hinders the entire nation in its efforts to earn more from exports.

The lack of market information has the effect of draining resources out of rural areas where poorest people live". This situation is in contrast with a more facilitating knowledge environment enjoyed by European farmers who have access to over 200 Internet sites containing information on prices, contact details for buyers and input providers, market news, yield forecasts, quality and packaging requirements, etc. on dozens of different products; and also enjoy a "plethora of additional information available from specialist journals, government agencies, traders, and farmers' unions"¹⁵.

It is therefore envisaged that a redesigned MIU would address the weaknesses in the current AgMIS. This would generate timely information not only on prevailing commodity prices in different markets during the day or past few days, but also be able to provide a near accurate picture of current and forecast stocks of commodities held by different aggregators: private and public entities engaged in commodity production and trade. The system should also provide intelligence on regional and international market prices to guide decisions for exporting; giving some indication of what type of commodities are in high demand, how much is needed and what level of selling prices such markets offer for our local exporters.

Among the type of information and data needed by financial institutions in designing their lending products and in project appraisals are cost elements along the commodity chains. Such information is necessary for deciding on profitability and ability of any given investment to breakeven or obtaining surplus for loan repayment. The information is also important in arranging for other banking instruments such as guarantees and letter of credit (LoC). From a macro-planning perspective, marketing intelligence on the types of dealers and their numbers in the markets and along the whole

¹⁵ Ibid: pg.3

value chains is also important in understanding the level of commercialization along the agricultural value chains.

The MIU will also be required to provide some information on changing levels of production costs and the potential competition between competing and substitute commodities. This is an important element in fully comprehending food security dimensions and the role non-food commodities can actually provide a more sustainable food security situation at household level than directly engaging in food crop production. Such information will be generated from specialized studies and surveys which the new MIU will have to undertake.

Given the multiple information products the new MIU is expected to generate, it may be inevitable for the Unit to brand itself as a **Marketing Policy Authority** which draws its energy from different agencies after agreeing on the format of instruments that can provide information relevant to MIU as well; thus avoiding duplication of efforts and financial resources. It is expected that whatever is produced by the MIU will continue to be a public good, and so there will be need to improve on the way such information is shared with the general public.

4.3 Mission

To support operations of key agricultural markets stakeholders – *government, private sector business community and development non state* actors by providing them with valid and reliable data and researched information on agricultural commodities.

MIU's principles and values shall include the following:

- ❖ listening, learning, improving and delivering quality information
- ❖ Focusing on delivering customer service and value for money.
- ❖ Being a reliable, trusted service provider
- ❖ Accessible and technologically up to date, welcoming 'digital natives', but supporting everyone.
- ❖ Transparent, collaborative and open

4.4 Functions of the MIU

- a) To collect up-to-date agricultural marketing information (inputs and outputs) for traditional cash and export crops and tradable food crops (principally those under the purview of the new Cereals and Other Crops Board) including imports, across the crops value chains.
- b) To ensure and maintain a data-collection and gathering system that recognizes other sources of data generation; and structure a system such that all are collated at the MIU. This will include use of the diverse on-going researches within and outside the country.
- c) To carry out analysis of agricultural marketing information and ensure regular periodic publication, dissemination and communication with the various stakeholders of the agricultural sector with regard to the current and future market conditions for the various crop value chains.

- d) To search for crops movement and prices including their inputs, crop policies and measures in neighboring countries and other countries which have a bearing on the performance of the agricultural sector in Tanzania.
- e) To provide AgMIS services to the public and private sector organizations/dealers including international agencies (as may be authorized by MALF).

4.5 Options for Institutional Hosting of the MIU

At the time of the inception of this study, several options for setting up an MIU were considered. Two prominent options were for it to either be a government Agency or a Unit at the MALF. This has over time been overtaken by events in that the New Government Instruments vest the responsibility of agricultural markets development, and hence market intelligence, under the MALF. Nonetheless, in pursuing this course and direction, the team thought it imperative to outline the pros and cons of the two options. The aim here is to ensure that the established unit not only addresses the potential and presumed shortfalls of the adopted option, but also taps on the potentials and good elements of the dropped alternative.

Table 3: Options for Setting up of MIU: An Executive Agency Option versus Being a Unit at MALF

S/N	EXECUTIVE AGENCY	A UNIT WITHIN MALF
	POSITIVE ELEMENTS	
1	<ol style="list-style-type: none"> 1. The autonomy inherent in agencies would enhance MIU’s professionalism and efficiency. 2. An agency would have the ability to focus on a narrow mandate with limited forces to digress it to other tasks. 3. Specialized staff can be recruited and off-loaded with relative ease. 4. An agency can enter agreements and working relationships easily with other non-governmental, local and international organizations. 5. The autonomy would enhance its ability to access development partners’ resources. 6. Autonomy may provide ground for innovation. 7. Agencies have room to develop fee based services and hence generate own income more effectively. 	<ol style="list-style-type: none"> 1. A unit in a ministry will be serving and delivering a key mandate vested on the ministry – i.e. markets development. 2. A central government unit in a ministry will be close to policy decision making and hence have relative ease in influencing policy changes. 3. It will build upon already established data collection systems. 4. The decentralized government machinery provides it with ready-made links with LGAs which are at the grassroots sources of the data.
	NEGATIVE ELEMENTS	
2	<ol style="list-style-type: none"> 1. Autonomy may distance it from the policy decision centers of the government. 2. Unless checked, it may end-up being self-serving and evolve to yet another research institution rather than a policy advising unit. 3. It will require additional efforts to establish links with grassroots sources of data. 4. Often, fees charged by agencies drive them towards a profit making motive at the expense of the desired and expected public service. 	<ol style="list-style-type: none"> 1. The necessary government bureaucracy may render the unit less effective and one with low levels of efficiency. 2. Experience shows that staff in such units end-up being assigned other more pressing tasks at the ministry. 3. Budgetary constraints and competition within units in a government ministry can deny such a unit the needed resources. 4. A government unit will not be able to cultivate business acumen in its operations and hence rely fully on subvention. 5. Routine government procedure may pose

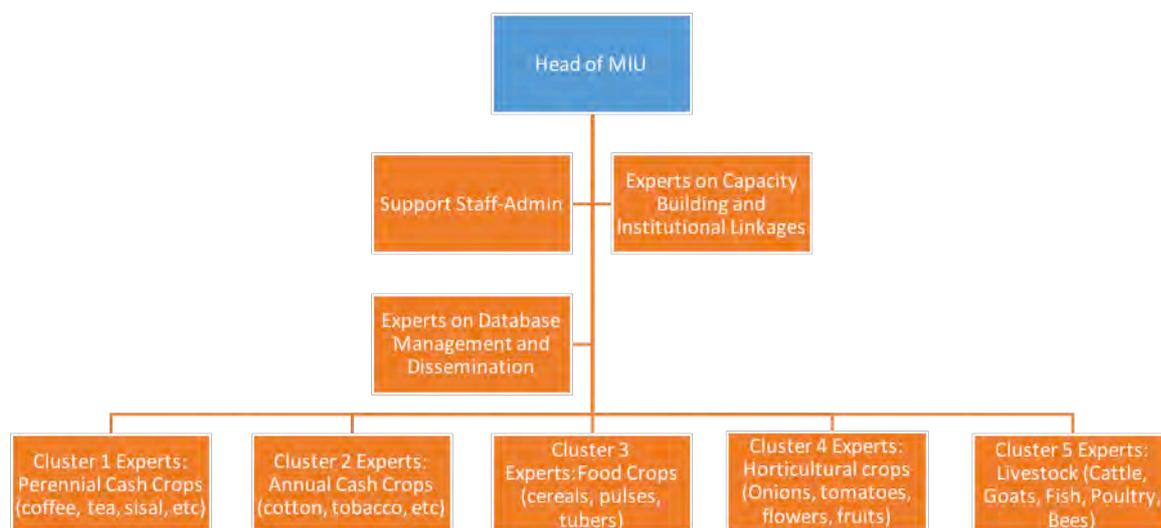
	hindrance on innovation.
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Considering the consequential positive and negative effects of establishing MIU either under MALF or executive agency, both options are viable in the short and long term, respectively. Therefore, it is being proposed that the envisaged MIU be established as a unit at MALF in the short run and subsequently transform it into an executive agency in the long term. This would benefit from, for example, the practical experiences of the current Commission for Cooperative Development (CDC) and the Irrigation Commission which were units in their former ministries.

4.6 Organizational Structure of MIU and Staffing

This report has identified five priority functions of the MIU. The functions will be clustered by the major sections of the MIU with specified officers to carry out the functions. The recommended three broad areas of focus by the MIU are: Coordination and execution of data collection and storing; Data analysis and publishing; and, Communication: Data and Publications.

Figure 3: Organizational Structure of MIU



The core team for the MIU will ideally be housed in the same building with offices for the Head of the Unit, Sectional Heads, Technical Staff and Support staff, ICT. The staff to be hired will have the ideal qualifications to be articulated in the Staffing Requirement of the Specified Establishment for MIU. Essentially, the staff will have to be organized into clusters based on commodity specialization as shown in Table 4. Each cluster will collect, analyze and publish market information for both inputs and outputs for each respective crops. There will also be shared personnel between the different clusters in areas of econometric analysis (e.g. trend analysis and forecasting work), database management, capacity building for equipping MIU staff and staff of collaborating institutions with the formal methodology and skills for data collection and analysis.

The staffing process for MIU will be gradual by consideration to transfer some of the key staff from the current department of marketing at the Ministry of Industry, Trade and Investment. This will include recruitment of the other required staff either as new recruits or transfers from other MDAs. Since there

are several agencies dealing with Agricultural MIS, it will be possible to get some of the basic skills from the current labour market.

Table 4: Proposed staff distribution by clusters based on commodity specialization

Key Functional Clusters	Commodity Categories	Skills Based within MIU in Dar			Staff Seconded to Collaborating Partners		
		Basic Skills Required	Shared Staff Skills	Commodity Specific Staff	Crop Boards	Regional Secretariat (per region)	District LGA
Coordination and Execution of Data/ Information Collection and Analysis	Perennial Cash Crops	Agricultural Economists or Agronomists	Statistics and econometrical analysis= PhD=2 and Masters=4. Total =6 ¹ ,	2	1	Trade/Commerce expert=1 and statistician=1	Trade/Commerce/extension officer expert= 1 and statistician=1
	Annual Cash Crops			2	1		
	Food Crops (cereals and pulses)			2	1		
	Horticultural crops	Horticultural economics/agronomy		2	1		
	Livestock	Livestock economists		2	1	Livestock expert/statistician=1	
	Poultry			1	1		
Database/Dissemination	Database Management, Publication and Dissemination	Database expertise, Communication and Desktop publishing	4 experts and 2 secretaries				
Capacity and Linkages	Capacity Building	M&E Expert and Trainer (to work with other agencies)	2 experts				

Note: ¹ of which two (1-PhD and 1-Master, will be dedicated to planning and executing research work in collaboration with Research Institutions and Universities. The list above excludes experts who will be working with research and higher learning institutions

The MIU will have its own staff mainly at the headquarters, but will need to work with many other personnel employed in other organizations in the course of accomplishing its mission. These will include those who will be formerly remunerated by MIU and those who will be outsources, seconded or motivated to work on behalf of MIU. The latter category includes staffs of the LGAs who will be involved in data collection and dissemination of reports at the regional and LGA level and below. This group will need special motivation because they will be undertaking assignments which are not the primary function of their immediate employer. Such a facilitation or motivation should be adequate and timely in such a way that self-responsibility and self-accountability for quality and timely data collection are adhered to.

4.7 Capacity Needs for MIU

Plausibly, it is assumed that the new MIU will be provided with adequate office space and basic infrastructural facilities by the host ministry (MALF); otherwise rental budget will be part of its operational and establishment costs. The core team for the MIU will ideally be housed in the same building with offices for the Head of the Unit, Sectional Heads, Technical Staff and Support staff. The office will have the necessary office equipment and ICT facilities for undertaking compilation and analysis of the collected data and information, storing it, and retrieving for sharing with other

stakeholders locally and internationally. The staff to be hired will have the ideal qualifications to be articulated in the Staffing Requirement of the Specified Establishment for MIU.

The hired technical staff will necessarily have some minimum prerequisite capacity to analyze market, agribusiness and trade conditions, undertake value chain analysis, design and management of surveys and studies, and some statistical/econometric analysis. Also they will be required to have skills in sampling techniques, comprehension of emerging markets and new outlets for agricultural produce, report writing and presentation skills, etc. This requires good analysts, with adequate agribusiness focus; some of the surveys and studies may not be very conventional i.e. more of business than mainstream economics. The Unit will also have staff with skills in ICT and effective communication and preparation of policy briefs.

Given its workload, it will be necessary for the unit to have some formal linkages with government agencies, as pointed out earlier, such as the National Bureau of Statistics and private sector companies, so as to complement its capacity needs, especially in outsourcing qualified manpower for time-bound assignments.



MIU will need to set up an effective and efficient network of data collection starting at the village level and major markets to district/urban councils, and then up to the national level. This will need well trained and facilitated team of data collectors at the various levels. The use of modern and appropriate ICT especially electronic data capture gadgets at the primary sources of data. The new MIU will draw staff from the existing data collection units/institutions, but also recruit new staff gradually to enhance its full capacity. Therefore, during the inception period, there will be special induction courses and refresher courses to enhance and sharpen the skills of the new and the existing staff. Nonetheless, as indicated earlier on, outsourcing for special services/skills both in the short and long term, remains an open option to the new MIU.

4.8 Legal Framework for Establishing MIU

The creation of MIU and its Mandate will draw its genesis and strength from the Presidential Instruments issued to the Minister after merging three ministries to form the current MALF. The instrument requires the Minister to have current data and information on prevailing market conditions for food and other crops in the country. The information needed for decision making purposes include current and projected levels of production, surplus stocks in warehouses, prevailing producer and consumer prices and international prices. It then goes without saying that the MIU will be housed and operated under the mandates governing MALF. However, it will still be necessary for the MIU to have some specific legislation to facilitate its operational interface with other agencies outside the parent ministry and outside government machinery such as private sector operators and international bodies.

This will inevitably demand that the existence of MIU is officially gazetted and specifications of what is required from other stakeholders spelt out.

In order to safeguard and assure allocation of funds, there shall also be a subsidiary legal instrument apportioning responsibility by requiring that each of the three main sectoral departments: Crops Department, Livestock Department and Fisheries Department to have a budget code for supporting MIU with some minimum amount of money supposed to be allocated in each financial year. This will assure the MIU to continue getting funds in the event the current arrangement where all the three departments are under one ministry is changed. LGA will also pass legislation to support MIU operations at district and ward level. Other arrangements, which will be backed by some legal or voluntary cooperation instruments will include:

- a) Government to instruct other agencies which routinely collect data/information, which is relevant to the analysis done by MIU to amend their laws to include reciprocal instruments committing them share their information with the MIU. The government will be advised which such institutions or agencies ought to share their information with MIU. This move will minimize costs of duplication in information gathering by different agencies.
- b) There shall also be legislation requiring private sector entities to share their marketing information with the MIU. The Unit may also sign a Memorandum of Understanding with CSO and time-bound donor funded programmes/projects, to share market information they collect at their expense or shared costs.
- c) Encourage regulatory agencies such as TFDA and NFRA to adopt some innovative administrative quasi-legal instruments to get some information on prices and stocks held by private sector operators and cooperative societies.
- d) To sign MoU with regional and international networks that are dedicated to commodity monitoring in order to have current and forecast quantities and prices in the international market. Regional networks include the East African Grain Council.

5. Institutional Linkages for Harmonizing Agricultural Data Collection Systems

The MIU will develop further the existing production and trade (price and volume) data collection systems in the MALF and augment it with other data systems external to the MAFC. The goal shall be to ensure that all data collected for the sector by various entities are consolidated at the MIU. The objective is to resolve the challenge of uncoordinated data for the sector through an outlined institutional linkage.

Traditionally, official nationally recognized agricultural statistics have been collected outside of the National Statistical System, with incomplete oversight by the National Statistical Office (NBS). The latter is the one responsible for the enforcement of statistical standards and best practices. As a result, reliability and validity of agricultural statistics have been questioned and their statistical integrity often doubted.

Such institutional inefficiencies are worsened by the compartmentalized set-up, methods and coverages of development partners' funded agriculture development projects. Data collected by such projects are definitely useful for monitoring of such projects and programs; however, they characteristically focus on the very narrow areas of their projects or programs.

This section summarises the current formal data systems that have implications on agriculture statistics. It also lists examples (not in any way exhaustive) of other agricultural data collection systems that have the potential to be linked with the proposed MIU – projects, programs, etc. The section then demonstrates how the leverage is going to work through institutional linkages; and lastly in this section is an outline of the potential role that the private sector will play in collection and dissemination of agriculture data.

5.1 The National Bureau of Statistics

It is urgently important that once the new MIU becomes operational, institutional linkage between the unit and the National Bureau of Statistics (NBS) is established. The NBS was officially launched as an executive Agency on 26th March 1999 under the Executive Agencies Act No 30 of 1997. The Act was used to transform the various departments into semi-autonomous government executive agencies so as to enhance efficiency and effectiveness in the delivery of services to the public. The NBS was officially re-established by Planning Commission through The Executive Agencies (The National Bureau of Statistics) Establishment Order 2000 (Government Notice No: 125 of 7/4/2000). The transformation of the National Statistical Office from a Ministerial Department to an Executive Agency, led to the enactment of the Statistics Act No. 1 of 2002 which repealed the Statistics Ordinance of 1961.

The MIU should deploy NBS for conducting surveys requiring national representation and jointly develop core modules and rotating modules. In doing so MIU should aim at anchoring its activities under the Tanzania Statistical Master Plan. Under this plan each sector, and in this case therefore agriculture, has to produce Sector Strategic Plan for Statistics. Once MIU's activities are registered under the statistical master plan it should deploy NBS for data collection to meet its mandate of collecting data that has users.

Important in this case is that the MIU should be placed under National Statistical System, governed by a National Statistics Council whose secretary is NBS. The Bureau collects a diverse range of survey data by maintaining international standards of sampling framework; and it is also a custodian of official statistics methodologies.

MIU will still have a role in terms of its exact mandate to provide intelligence in the area of agricultural information and hence should not preclude collecting its own data. MIU can make use of NBS when it establishes questionnaires, sampling frameworks, enumeration areas and the technical inputs required to ensure own collected data are nationally representative.

Some of the national agricultural statistics (compiled by NBS) in Tanzania that ought to be linked with MIU electronically and upon which the MIU could start building their data base include: 1. National Sample Census of Agriculture which is conducted every 5 years; 2. National Panel Survey, conducted after every two years; 3. Large-scale Farmer Reports, conducted annually; and 4. Household Budget survey, conducted every 5 years. These are different from those collected by MALF such as Agricultural Routine Data System - monthly, quarterly, annual; Food Security Assessments - twice a year; Routine Agriculture Data system; Crop & Livestock Market Price Reporting – weekly etc.

5.2 Planning Commission

The National Planning Commission at the Ministry of Finance and Planning is the custodian of all national plans. All other planning activities, that source financing from the national budget, constitute interpretation of the national plans at the various respective levels. Therefore, the envisaged MIU is a hub of the Planning Commission for all issues relating to agricultural marketing information crucially needed for setting plans at all levels. The outputs of the MIU will constitute an important set of inputs needed in the course of setting national plans. The two institutions shall seek to forge working relationship and thus joint possible financing from various sources.

5.3 Tanzania Meteorology Agency

Information on rainfall availability has a direct link to food security, availability and access. MIU shall have to establish a working relationship with the Tanzania Meteorology Agency (TMA) for such information including procurement of data sets that are on sale.

According to a USAID-FtF (2016) assessment, the TMA collects weather data from a number of different weather stations of different degrees of complexity. There are twenty-seven centers measuring a wide variety of variables, which are electronically transmitted every 30 minutes to the National Centre. There are also 13 agro-meteorological stations collecting data on temperature, rainfall, soil water, soil temperature and pan evaporation rates. The stations contribute to the critical data on weather provided by TMA. The Agency also collects data on crop and pasture conditions as well as groundwater availability. This information is sourced from the District Agricultural and Livestock Development Officers (DALDOs) of each of the 40 District Councils that submit meteorological data.

The key strength of the TMA data reporting system appears to be its reliability. All 40 weather stations are actively canvassed by phone every 10 days so that the incidence of missing data records is low. The primary weakness of the TMA data system is the level of resolution that is possible using only 40 weather stations. Although the calibration of satellite data allows wider coverage and greater resolution, this is limited to rainfall anomalies that can be calibrated against rain gauge data, but is not possible for NVDI data. The data collection process is effective, but relies upon manual data collection over mobile phones¹⁶.

5.4 Cooperatives: Apex and Primary Cooperatives

Despite the challenges that the cooperative movement has been experiencing in Tanzania, apex cooperatives remain very useful sources of agricultural data, particularly production and prices. All major apex cooperatives – for Coffee, Tea, Cotton, etc. have the following as their responsibilities: (i) to coordinate organise and sensitize farmers in the production; (ii) To process the products (in the case of coffee) at minimal costs and market their produce at highest prices obtainable; (iii) To collect, analyse and disseminate relevant information and statistics to the industry (iv) Train their members through various capacity building programs. The marketing sections of these apex cooperatives bodies are the ones normally vested with management of production and marketing (volumes of sales and prices) data; and issues regarding quality and grades. Close to the marketing section, in as far as production data, are

¹⁶ USAID – Feed The future / Booz Allen Hamilton (2016). An Assessment of The Tanzania's Food Security Early Warning system. Feed The Future Program, Dar-es-salaam, Tanzania.

the farmers technical support sections where there is useful production inputs data: estimates, supplies and prices. The MIU shall have to forge working relationships with the cooperatives to tap on this wealth of information.

Interviews with The KNCU revealed willingness of cooperatives to cooperate in activities such as data collection. Apparently advanced cooperatives have a network of crop specific extension workers in the growing regions. Amongst other activities, such extension workers collect agriculture statistics that is collated at the Cooperative's head office. Joint review of the instruments used by cooperatives extension workers could buttress and beef-up information for the MIU.

5.5 Donor Funded Projects and Programs

Agriculture development projects funded by development partners invariably build in monitoring and information systems that generate market tips, among others. There are several shortfalls in such data systems – they are very specific to the project goals and objectives; they are for relatively short term purposes aligned with the life time of the projects; they pose sustainability challenges in that they will not continue after the project or program, etc. Therefore, such data may not be at the core of the MIU structure. However, such projects offer good ground for experimenting and ground proofing realities such that the validity of the mainstream data can be authenticated. Such projects also offer opportunities to test various types of field data collection and management instruments. MIU will therefore aim to establish working relationships with such donor funded projects and programmes. Examples, not exhaustive in any way, include MIVRAF – Infrastructure, market infrastructure and value addition, JICA agriculture Data Systems Support, SAGCOT private sector investment facilitation; a range of World Bank projects including support for the national statistics and data systems; FEWS Nets - Farming and early warning systems network.

5.6 Marketing Boards

The future of crop marketing boards is currently uncertain. There are possibilities for all traditional cash crops boards to be merged into one entity to lower bureaucracy and taxes imposed on farmers. Regardless, crop boards have been players in the marketing systems of crops such as sugar, tobacco, tea, coffee, cashew nuts and hence are archives for useful information. The cereals and other produce board has not yet operated in any significant way. Depending on their future, MIU and MALF will still have to forge working relationships with the successor of their activities.

5.7 Private Sector Associations and Individual Companies

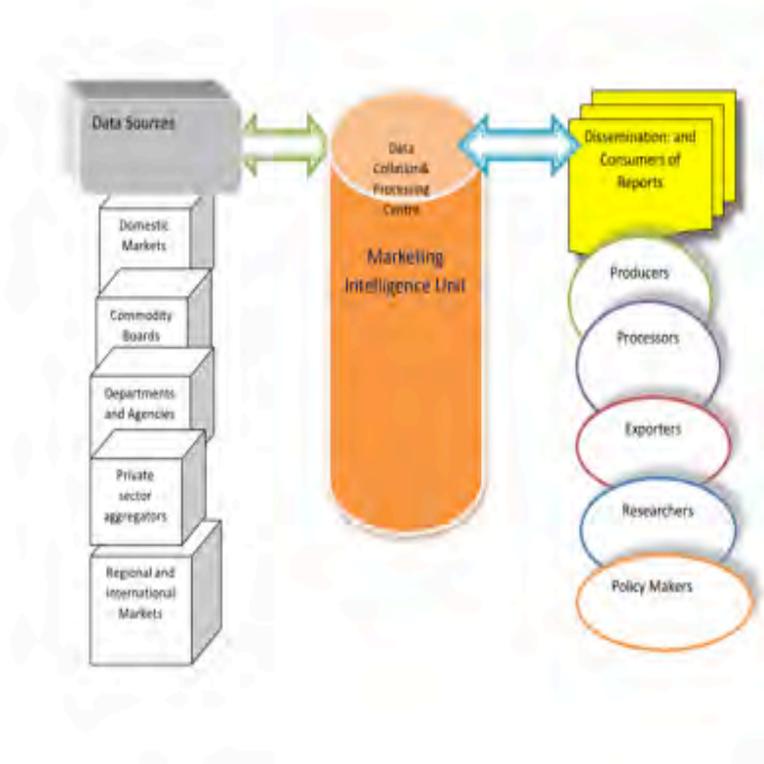
The MIU will seek to link with the private sector for mutual benefits to the two parties. The post liberalisation era has evidenced major contributions made by the private sector in agricultural marketing and trade. Private companies like Olam Tanzania, Rafael Group, Ruaha Millers, Mohamed Enterprises Ltd, Azam and Bhakresa Ltd, Export Trading Group, to mention a few, have filled the gap left by state Owned Trading Organisations (Parastatals) like the General Agricultural Produce Export (GAPEX) and The National Milling corporation. Apex Industry Associations such as Tanzania Chamber of Commerce, Industry and Trade; Tanganyika Farmers Association, Agricultural Council of Tanzania, Tanzania Milk and Dairy Products Association (TAMPRODA), the East African Grain Council and the Tanzania Horticulture Association are providing substantial intelligent information to its members. Not only do they aid

marketing and trade but also facilitate a diverse range of services form access to inputs to training and extension services.

To achieve meaningful results, however, MIU will have to forge differentiated working modalities with two broad categories of the private sector. One is Agriculture inputs and commodity trading companies which could in the first round include Azam and Bhakresa, Export Trading Company Co. Ltd, Mohamed Enterprises Ltd, Olam Tanzania, and Tanzania Leaf Tobacco Company Ltd. The second category is Apex commodity industry Associations which, to mention a few, include Tanzania Horticulture Association – TAHA; Tanzania Chamber of Commerce, Industries and Agriculture – TCCIA; Tanganyika Farmers Association; and the East African Grain council. The private sector is a key stakeholder in MIU. Its complementary role is therefore crucially needed to ensure that MIU works effectively.

Right away at the onset of the MIU, there should be a consultative meeting with the key stakeholders to deliberate on working relationships given the mandate of MIU and thus seek to establish MoUs with all key stakeholders. The purpose of the MoUs should be to ensure that both parties, MIU and Key Linked Institutions, draw benefits from joint efforts. The modus operandi should be that both contribute feeding data into the database and also receive useful comprehensive data sets and results of analyses and publications done by the MIU. Major outputs of the MIU shall be electronic database and dissemination materials. Partners describe above shall deliberate on the nature, frequency and contents of the dissemination materials.

Figure 3 Scheme of Data and Information



6. Financing Arrangement for MIU

The MIU will be a unit of the Division of Agricultural Markets Development. The primary mode of funding the unit shall therefore be government budget. The unit will therefore receive subvention within the MALF funds allocated for the sector budget in crops, fisheries and livestock.

However, considering the importance of the unit in policy advice, and the fact that it is new, a recommendation is for it to be strategically designated as a development activity in the ASDP II and therefore receive a funding as special program and the projects it oversees. The MIU will also seek for special grants for development partners.

All the above require MALF to include MIU in the MTEF. This is a projection of over three years that seeks to: i) cost programs; ii) seek commitments from donors; iii) harmonize foreign aid; and; iv) influence sector strategies. Though stagnating, the MTEF is supposed to set out a prioritized three-year set of integrated estimates for recurrent and development expenditure (whether financed by Government or Donors) based on the performance indicators set out in the strategic plans of all MDAs. It is the recommendation of the team for MALF to include MIU as a strategic activity and also set targets for its performance indicators. Building on the MTEF, the MIU should be receiving annual subvention as a high priority activity. The initial stages of the unit will be critical and especially the funding for operationalising the unit. If possible, DPP should seek for a ring fenced funding, MAFL may also liaise with NBS to jointly justify the funding for this case.

The recommendation to include MIU under ASDP relies on the fact that sector basket funds and subvention provide additional recurrent funding for key sectors direct from the respective ministries. This may assist to cover funding requests for the MIU at LGAs. The Agriculture Sector Development Programme (ASDP) provides funding to all councils for DADPs where requirements of extension workers in order to fulfil their data collection tasks could be met. Overall MALF will have to include MIU activities in its Five Year Development Plan and hence include budgetary provision annually.

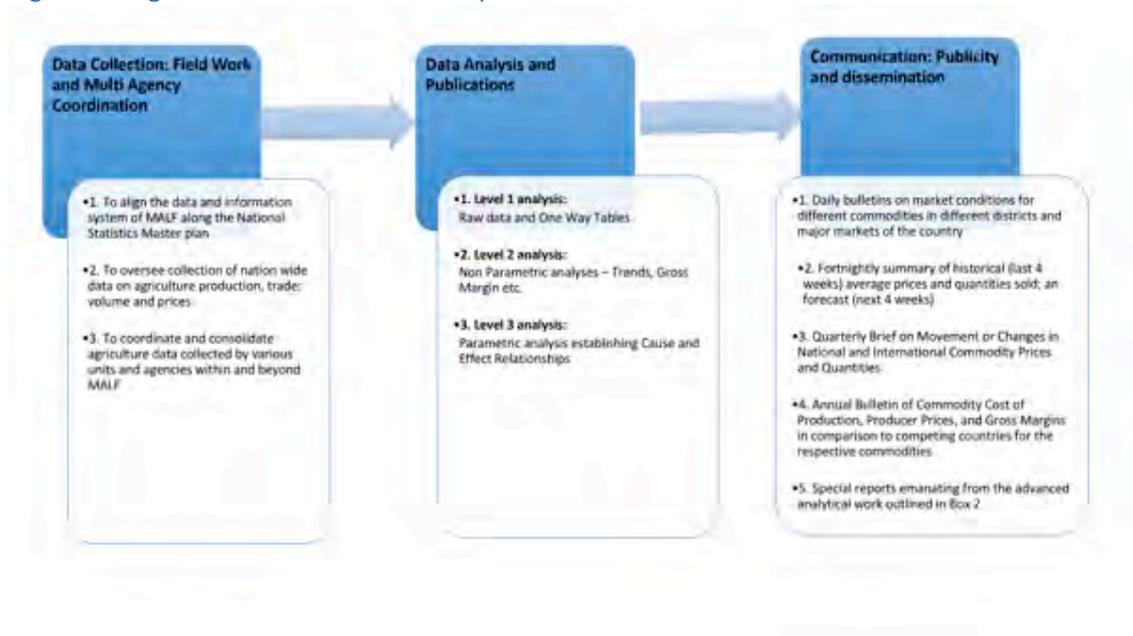
There are a few donors who have indicated possibilities to support the MIU during its formative stages these include:

- i. USAID – may support the experimentation of a set of 3 to 5 crops.
- ii. JICA – there is a possibility to continue with the support it has provided to develop the ARDS.
- iii. FAO has sources resources and supported agricultural data systems for a long period and may be approached
- iv. World Bank is supporting the development of the National Statistics Master plan

7. Expected Outputs of the MIU

This report has identified five priority functions of the MIU. The functions will be clustered by the major sections of the MIU with specified officers to carry out the functions. The recommended three broad areas of focus by the MIU are: Coordination and execution of data collection and storing; Data analysis and publications; and, Communication: publicity and dissemination. There are several activities that the MIU has to undertake under each major section.

Figure 4: Logical Work Flow of MIU Outputs



One of the expected key outputs of the MIU is a quarterly report which resembles the recently completed assessment of the markets of staples in Tanzania undertaken by the outgoing SERA programme at MALF. The SERA report (July 2016) shows trends in yearly production, storage and price and traded volumes for the staples in Tanzania.

8. Expected Challenges and Risks

The new MIU will take over the functions of the agricultural marketing MIS currently undertaken by the Marketing Unit at the MITM. This will also involve consolidation of the MALF units dealing with agricultural marketing MIS into the new MIU, which is expected to work with many other stakeholders involved in the collection and analysis of agricultural marketing MIS. The new MIU will encounter challenges in the course of its establishment and execution of its function at MALF as follows.

8.1 Limited Autonomy

MUI will be established under MALF plausibly in the division of Agricultural Markets Development. As indicated earlier, the objective is to resolve the challenge of uncoordinated production of data for the sector through an outlined institutional linkage. Working under MALF will implied that MIU will have limited autonomy in terms of engaging other players in the sector and outside the sector to accomplish its mission. This may slow down its efficiency and limit its innovative capacity beyond its primary functions. Establishing MIU as an executive agency would to a large extent mitigate this problem.

8.2 Inadequate funding

Establishment of MIU needs initial investment to cover infrastructural facilities and staffing right from the bottom level (major markets and villages) to the headquarters or MALF. The activities of the unit will be routine and involving a network of data collection and feedback information. Routine collection and

analysis of up-to-date AgMIS Data is expensive as it involves reaching out many dealers across many crop value chains spread all over the country. Budgetary cuts and underfunding are notably in the agricultural sector; implying that the new MIU will also inherit such problems. Even with ring-fencing, as commonly seen as a solution, underfunding would still persist due to the small size of the national cake and priority setting. Thus, other sources of funding that include Development Partners, the Private sector, etc. are deemed crucial in mitigating the problem of underfunding of the MIU.

8.3 Difficulties in compiling up-to-date data

Compiling national data on crop value chains requires information from all data collection points in the country in order to aggregate them into total national figures. This will require frequent, efficient and on time collection and forwarding of the information. Some of the data collecting points are in remote areas and forwarding data to higher consolidating centres may not be so smooth when confronted with breakdown in the communication system. For example, areas with no or limited power supply may face this problem. But also the efficiency of the MIU team in analysing the information and communicating the results to the stakeholders on time is another issues that my compromise performance of the MIU. Continuous training of the MIU staff with regard to management of the data collection system, analysis and time dissemination is needed. More important, is to ensure that always there are electronic data collection/management tools/gadgets that are rechargeable by reliable source of power, for example solar power, etc. The gadgets should also be easy to replace when they are lost/mishandled or destroyed.

8.4 The data ought to be valid and reliable

One of the main reason why there are several data collecting agencies is because some of the existing agricultural data are not valid and reliable. MIU will have to ensure that the information collected and analysed is valid and reliable; and this must be effectively felt by other data collecting agencies/units and the entire spectrum of stakeholders in the sector, so that MIU becomes one stop centre for national data/information on agricultural marketing data in Tanzania. Therefore, building up a competent and efficient team at MIU is deemed crucial.

8.5 Analytical skills-gaps at MALF

The MIU should not only produce basic raw data; it ought to consider various levels of analyses that will suit the needs of the various stakeholders in the crop value chains. For this sake, there may some skills gaps at the ministry, and thus requiring outsourcing while at the same time engaging in long term training of the young staff and short term for the relatively senior ones. However, technical cooperation with other institutions/entities outside the ministry may be one of the viable option of addressing the problem.

8.6 Accountability issues

MIU will be dealing with a big network of data collection and dissemination of agricultural marketing information. As such, there will be many people who will work directly and indirectly under the MIU. The unit cannot employ all the people needed in the entire system of its functions, some of the staff will just be engaged through bilateral agreements while others will be some of the existing government employees. This will imply that MIU will not have commanding power over some of the people working with it. This may create delays and under performance on the side of the unit because this are

employees who are not accountable to MIU but their other immediate bosses. Clearly, the weak links between MALF and LGAs will have to be addressed.

8.7 Lack of Systematic Uniform Weights and Measures at the grassroots markets

The issue of realistic, fair and more consistent weights and measures have been a major debate in the agricultural sector in Tanzania. Traditional measurements in the form of sacks, tins, etc. have been widely condemned as being exploitative to ordinary farmers. The government is urging the use of formal measures in the form of kilograms etc. with a view of protecting small producers. However, this has not been very successfully yet; a number of people still use the traditional measures, which do not ensure uniformity in reporting of agricultural marketing information from the various collection points. With the onset of MIU, the use of formal measures must be spread nationwide to ensure uniform and systematic reporting of agricultural marketing information.

9. Proposed MIU Work Plan and Budget for 2016/17 – 2017/18

The first two years of the establishment of the MIU will be used to set up the unit by appointing the head and assistant heads of the unit, getting office space, staffing the unit, procuring the necessary equipment and furniture, and preparing operational manuals and policy. During this time, MIU will also arrange to carry out consultative sessions with other actors in the AgMIS, build its up operational systems interactively with other players, refining legal framework for institutional linkage, and arrange to provide training for capacity building to staff.

MIU will envisage to start with a few selected crops, advisably those being dealt with by the current agricultural marketing MIS, before embarking on other crops. These will be used to operationalize the MIS at the new MIU and produce the first outputs within the first two years. This will also involve dissemination and feedback from various stakeholders for the subsequent improvement.

9.1 Proposed activity plan and budget for the first two years

S/N	Major Activity	Detailed Activities	Output/Outcome	Time line (months and weeks)	Responsible Unit/head/Person/MDA	Result Indicators	Estimated costs in TZS
1	Appointing the head of the MIU	<ul style="list-style-type: none"> MALF sets up a search committee The Search committee prepares a list of candidates MALF appoints MIU 	Head of MIU appointed	One month	MALF	One head appointed	0
2	Appointing MIU cluster heads	<ul style="list-style-type: none"> Head of MIU submits potential candidates to MALF MAFL appoints cluster heads 	Cluster heads appointed	One month	MALF	5 cluster heads appointed	0
3	Getting office space	<ul style="list-style-type: none"> MALF provides office space for MIU 	MIU Offices secured	One month	MALF	Adequate office space acquired for MIU activities	To be determined
4	Staffing the unit	<ul style="list-style-type: none"> MALF recruits new staff for MIU 	Staff for MUI recruited/appointed	Six months	MALF	28 personnel recruited/appointed	Total per month = 56,281,250 New cost per month 7,562,500
5	Procurement of the necessary equipment and furniture	<ul style="list-style-type: none"> MALF procures furniture for MIU 	MIU becomes fully furnished with basic office furniture and modern ICT for data management, analysis and dissemination	Six months	MALF	All the necessary furniture and equipment procured	230,500,000
6	Preparation of operational manuals and policy	<ul style="list-style-type: none"> MIU to prepare operational (possible outsourcing) 	MIU operational manuals and policy prepared and adopted	Three months	MIU	One MIU operational manual and one policy prepared	45,000,000
7	Carrying out consultative sessions with other actors in the AgMIS	<ul style="list-style-type: none"> Hold consultative sessions with stakeholder institutions to agree on synergies in management of agric. Marketing information and streamline the role of MIU 	Operational policy and linkage with other agric. data stakeholders agreed and memorandum of understanding for cooperation signed	Three months	MIU	All stakeholders collecting nation-wide agric. Marketing information sign memorandum of understanding with the MIU	50,000,000
8	Building up operational systems	<ul style="list-style-type: none"> MIU to work out and install operational systems (possible out 	MIU operational system in place and tested	Six months	MIU	MIU operation system for data management and dissemination in place	200,000,000

		sourcing)					
9	Refining legal framework for institutional linkage	<ul style="list-style-type: none"> MALF (in consultation with other stakeholders) to refine the legal framework for the operations of the MIU 	Legal framework reviewed and amendments made accordingly	12 months	MALF/MIU	All legal requirements for functional MUI fulfilled	20,000,000
10	Capacity building to staff	<ul style="list-style-type: none"> MIU specifies staff who need capacity building and type thereof MIU identifies sources of services for capacity building MIU arranges and provides capacity building for staff 	MIU staff receive the initial training and becomes capable of handling their duties	One year	MIU	All staff of MIU given orientation and one initial training	150,000,000
11	Selection of few crops for starting	<ul style="list-style-type: none"> MIU selects to include all the current crops or a few of them to start its new system 	Initial crops for initializing the new system selected	Three months	MIU	At least three crops are selected for testing in the new system	0
12	Operationalization of the agricultural MIS at the new MIU	<ul style="list-style-type: none"> MIU undertakes to test and operationalize its new systems 	The new agric. marketing MIS becomes fully operational	One month	MIU	Presence of fully operational MIU	200,000,000
13	Production of the first outputs	<ul style="list-style-type: none"> MIU publishes the first outputs 	First reports published	Within the first two years	MIU	Published First report for every cluster	100,000,000
14	Dissemination and feedback from various stakeholders	<ul style="list-style-type: none"> MIU disseminates the first outputs and gets feedback 	First reports/database/products of MIU disseminated and feedback received	Within the first two years	MIU	Disseminated first round of reports with feedback received	100,000,000

9.2 Estimated Staffing levels and Costs for the Proposed MIU

S/N	Name of MIU Cluster/Sub unit	Total number of Technical staff required	Total number of staff that can be recruited from internal rearrangement at MALF and MTIM		Total number of new staff required to be recruited		Total staff costs of MIU– Tshs/month
			Number	Total current costs (salaries) – Tshs/month	Number	Estimated total new salary costs	
1	Head of the MIU	1	1	4,625,000	0	0	4,625,000
2	Support Staff-Admin	4	2	1,637,500	2	1,450,000	3,087,500
3	Experts on Capacity Building and Institutional Linkages	2	1	2,606,250	1	2,037,500	4,643,750
4	Experts on Database Management and Dissemination	4	2	5,212,500	2	4,075,000	9,287,500
5	Cluster 1 Experts: Perennial Cash Crops (coffee, tea, sisal, etc.	3	3	6,112,500	0	0	6,112,500
6	Cluster 2 Experts: Annual Cash Crops (cotton, tobacco, etc.	3	3	6,112,500	0	0	6,112,500
7	Cluster 3 Experts: Food Crops (cereals, pulses, tubers)	3	3	6,112,500	0	0	6,112,500
8	Cluster 4 Experts: Horticultural crops (Onions, tomatoes, flowers, fruits)	3	3	6,112,500	0	0	6,112,500
9	Cluster 5 Experts: Livestock (Cattle, Goats, Fish, Poultry, Bees)	5	5	10,187,500	0	0	10,187,500
Total Salary Per Month				48,718,750		7,562,500	56,281,250

9.3 Estimated Costs of Infrastructural facilities for the proposed MIU

S/N	Name of MIU Cluster	Type of infrastructural facility needed	Amount/size/number	Cost per unit in TZS	Total costs in TZS
1	Head of MIU Office	Photocopy-Heavy Duty; Projector; Office Furniture; Kitchen appliances; Computer and its accessories; printer; and Scanner.	25,000,000; 5,000,000; 10,000,000; 2,000,000; 3,600,000; 750,000; and 750,000 respectively	1	47,100,000
2	Support Staff-Admin	Staff-Driver/Secretary - Office Uniform	100,000	4	400,000
3	Experts on Capacity Building and Institutional Linkages	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 3,600,000; 750,000; and 750,000 respectively.	2	15,600,000
4	Experts on Database Management and Dissemination	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 4,500,000; 750,000; and 750,000 respectively.	4	34,800,000
5	Cluster 1 Experts: Perennial Cash Crops (coffee, tea, sisal, etc.	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 3,600,000; 750,000; and 750,000 respectively.	3	23,400,000
6	Cluster 2 Experts: Annual Cash Crops (cotton, tobacco, etc.	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 3,600,000; 750,000; and 750,000 respectively.	3	23,400,000
7	Cluster 3 Experts: Food Crops (cereals, pulses, tubers)	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 3,600,000; 750,000; and 750,000 respectively.	3	23,400,000
8	Cluster 4 Experts: Horticultural crops (Onions, tomatoes, flowers, fruits)	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 3,600,000; 750,000; and 750,000 respectively.	3	23,400,000
9	Cluster 5 Experts: Livestock (Cattle, Goats, Fish, Poultry, Bees)	Table; Chair; Office Cabinet; Computer and its accessories; printer; and Scanner.	1,500,000; 600,000; 600,000; 3,600,000; 750,000; and 750,000 respectively.	5	39,000,000
Total Budget for Office Facilities					230,500,000

9.4 Estimated Budget for MIU for 2016/17 – 2017/18

S/N	Expenditure Category-TZS	2016/17	2017/18	2018/19
1	PE	675,375,000	1,013,062,500	1,519,593,750
2	OC	1,095,500,000	865,000,000	1,081,250,000
3	Total Budget	1,770,875,000	1,878,062,500	260,084,3750

10. Conclusions

This report set out to assess the current situation of the agricultural marketing information system in Tanzania, with a view of establishing an Agricultural Marketing Intelligence Unit (MIU). The findings of this report have shown the merits and demerits of the current AgMIS in Tanzania. The demerits call for more enhanced institutional arrangement and a national system of compiling, analyzing, reporting and disseminating AgMIS. This is further augmented by AgMIS organizational and functional experiences drawn from other countries; and the fact that the Presidential Instruments issued to the new Ministry-MALF after merging two ministries (Agriculture, Food Security and Cooperatives; and Livestock and Fisheries Development) requires the Minister to have current data and information on prevailing market conditions for food and other crops in the country. Accordingly, this report has proposed establishment of Market Intelligence Unit (MIU) at the Ministry of Agriculture, Livestock Development and Fisheries.

The proposed MIU will work under the MALF to serve all stakeholders of the sector by providing them with valid and reliable data and researched information on agricultural commodities. The MIU will develop further the existing production and trade data collection systems in the MALF and augment it with other data systems outside MAFC to ensure that all data collected for the sector by various entities are consolidated at the MIU.

The primary mode of funding the MIU shall be the government budget. The unit will therefore receive subventions within the MALF funds allocated for the sector budget in crops, fisheries and livestock. This will include any other possible sources of funds for development activities of the unit. MIU will envisage to start with a few selected crops, advisably those being dealt with by the current agricultural marketing MIS, before embarking on other crops. These will be used to operationalize the MIS at the new MIU and produce the first outputs within the first two years. The estimated costs of MIU for the first two years have been estimated to be TZS 1,878,062,500 including personal emoluments and other charges.

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Annex 1

MAIN SOURCES OF AGRICULTURE DATA – A NEED TO PULL THESE TOGETHER

Institution	Activity	Frequency	Data Collected	Resolution
NBS	Calculation of CPI	Monthly	Retail prices of 244 items including food basket components	Regional markets
	National Panel Survey	Every 2 yrs	All aspects of livelihood including income, expenditure and diet, collected from a preselected and panel of households.	Dar es Salaam, Zanzibar, Urban, Rural.
	National Sample Census of Agriculture	Every 5 yrs	Production, yield, input usage, income, assets, extension, irrigated area, mechanisation	
	Household Budget Survey	Every 5 yrs	Household income and expenditure	Mainland, Urban, Rural Dar es Salaam
	GDP Calculation	Every Year	Income from different activities/livelihoods	Regional
MAFC (ARDS)	LGMD2i	Monthly, Quarterly, Annually	Data on production, markets, food security, crop and livestock health, Activities, Visitors, Weather,	Village and Ward level data aggregated at District and Regional levels
MAFC (Dept. of Food Security)	FSQ1	Twice per year		District summary of village-level data
	WRS1-5	Every two weeks		District summary of village-level data
	RRS1	Monthly		District summary of village-level data
MIT	LINKS	Monthly	Prices of Livestock and Meat	53 TAMISEMI or MAFC markets
	FAMS	Monthly	Wholesale staple crop prices. Retail vegetable prices	Regionally important markets

MAIN SOURCES OF AGRICULTURE DATA – A NEED TO PULL THESE TOGETHER

Institution	Activity	Frequency	Data Collected	Resolution
TMA	Synoptic Weather Data System	Every 30 minutes	All aspects of weather	Electronic from 27 stations
	Agricultural Weather data	Every 10 days	Rainfall, temperature	Phone/SMS/Email - 13 stations

Annex II- List of Stakeholders Consulted

S N	Date (2016)	Institution and Physical Location	Contacted Person	Position	Telephone (+255 ...)	Email
1	19/5/16	East African Grain Council	Mr. Junior Ndesanjo	Program Officer	0716653923	jndesanjo@eagc.org
2	20/5/16	Wangingome District Council, District of Njombe, Njombe Region	Ms. Bernadetta Fivawo	Agricultural Officer	0754870409	detafivawo@yahoo.com
3	20/5/16	Makambako Town Council, Njombe Region	Mr. John Makona	Agricultural Officer	0755822495	johnmakona@hotmail.com
4	21/5/16	SAGCOT Centre Ltd	Mr. Geoffrey Kirenga	CEO	0756480069	geoffreykirenga@gmail.com
5	25/5/16	Tanzania Leaf Tobacco Company	Mr Louis C. Roussos	DFC and Logistics	0688-411555	Director - iloussos@ulitanz.com
6	25/5/16	Tanzania Leaf Tobacco Company	Mr. Colin Blair	Agronomy Director	0686104040	cblair@ulitanz.com
7	25/5/16	Tanzania Leaf Tobacco Company	Richard Andrew Sinamtwa -	Director of Corporate Affairs	0784640000	rsinamtwa@ulitanz.com
8	26/5/16	Economics and Social Research foundation (ESRF)	Prof. Haidari Amani	Senior Associate Researcher	0754210181	hamani@esrf.or.tz
9	27/5/16	Kilimanjaro Native Cooperative Union (KNCU)	Mr. Honest Peter Temba	General Manager	0754537650	htemba@gmail.com
10	27/5/16	Tanzania Coffee Board	Mr. Primus Kimaryo	Director General	0754363202	dg@coffeeboard.or.tz kimaryo@gmail.com
11	27/5/16	Moshi Cooperative University College	Dr. Esther Towo	Director of Research and Postgraduate studies	0754496124	awaichisaria@gmail.com
12	03/5/16	Financial Sector Deepening Trust	Mr. Sosthenes Kewe	Executive director	0756776336	sosthenes@fsdt.or.tz
13	16 May	Ministry of Agriculture, Livestock and Fisheries. Kilimo 1, Mandela Road,	Simkanga, J (Ms)	Director of Policy and Planning	(0)767 562665	jsimkanga@yahoo.com
			Hingi, P (Ms)	Principal Economist		mHINGI@yahoo.co.uk

S N	Date (2016)	Institution and Physical Location	Contacted Person	Position	Telephone (+255 ...)	Email
		Temeke, Dar es salaam	Malema, Beatus	Economist		
			Lemweli, Ombaeli	Head, Food Security		
			Pendo (Ms)	Economist		
14	17 May	Tanzania Agricultural Development Bank, Acacia House, Kinondoni Road, Kinondoni, Box 9192 Dar es salaam	Samkyi, Thomas	General Manager		
				Director of Planning, Research and Policy		
15	17 May	Ministry of Labour	Makbel	Director of Statistics		makbel@nbs.go.tz
16	19 May	Ministry of Agriculture, Livestock and Fisheries. Kilimo 2, Mandela Road, Temeke, Dar es salaam	Rutabanzibwa, Audax	Registrar of Cooperatives	(0)754 604996	audax.rutabanzibwa@ushirika.go.tz
17			Ahmed, Ally	Economist	(0)713-598896	Allyahmed03@gmail.com
18	20 May	Kariakoo Markets Corporation, Nyamwezi/Sikuku u St, Kariakoo, Dar es salaam	Group of Traders led by			
19	20 May	Ex-Employee of Marketing Development Bureau	Massawe	Businessman	(0)754 337957	
20	23 May	Nyanza Cooperative Union Mwanza	Seni, Richard	General Manager	(0)	Senirichard_senico@yahoo.com
			John Masalu	Marketing Manager	(0)754 624831	John.masalu@yahoo.com
21	23 May	Mwanza Regional Administration Secretariat, Mwanza	Owenya, Christina	Regional Trade Officer	(0)757 852449	Christinaseda1976@yahoo.com
22			Kurwijila, N.S.	Assistant Administration Secretary (AAS)		
23			Kasele, Peter	Livestock Officer	(0)752 893996	Kaseleuyw20@gmail.com
24			Kilo, Titus	Fisheries Officer	(0) 764 969532	titulau@gmail.com
25	24 May		Kyamani, Candida	Livestock Officer	(0)784 762287	ckyamani@yahoo.com
26			Keya, Makenzi	Agricultural Officer	(0)767 500826	keyamakenzi@yahoo.com
27			Bundala, Victor	Agricultural Officer	(0)784 883645	Bundalau2000@gmail.com
28			Aron Kalondwa	Agro-Engineer	(0)752 293416	Aron.kalondwa@mwanza.go.tz
29		Mwanza Main Market, Rwegasore Street, Nyamagana, Mwanza	Mahmood Hassan	Eggs Trader	(0)754 958981	
30	24 May		West	Cereals Trader- Soko G	(0)764 042478	
31			Marwa, Huburya	Fish Traders, Soko D	(0)753 330816	

S N	Date (2016)	Institution and Physical Location	Contacted Person	Position	Telephone (+255 ...)	Email
32			Mashauri, Deogratius	Fish Traders, Soko D		
33			Bagambabyaki, Nestory	Wholesale Trader-Cereals, Soko C	(0)756 043033	
34			Salum, Saïdy A	Potato Wholesaler, Soko A	(0)784 848150	
35		Mwanza Main Market	Mang'era, Barnabas J	Head of Market/Administrator	(0)786 120000	
36	26 May	Agra Climate Smart Agriculture Programme	Edward Agaba	Mbeya Regional Liaison Officer	(0)766 806989	eagaba@agra.org
37	27 May	Regional Administration Secretariat, Regional Block, Mbeya	Kayombo, Wilfred	Agricultural Officer	(0)758 146263	Kayombo.w@mbeya.go.tz
38			Mapunda, Kinstian John	Livestock Officer	(0)754657637	Mapunda50@gmail.com
39			Lameck, Christopher	Agric Officer (Statistics)	(0)755 815171	Christopher.Lameck@gmail.com
40			Maganga, Angela	Cooperative Officer	(0)752 215693	Anjela.maganga@gmail.com
41		Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA), TANESCO Building, Mbeya	Malinza, Emile A.	Vice Chairman (Commerce)	(0)715 or (0)784/770877	Emalinza@gmail.com or tcciambeya@yahoo.com
42		Abel Rice Milling Company, SIDO Mwanjelwa Industrial Complex, Mbeya	Mwang'onda, Abel A	Managing Director	(0)754 493870	
43		Mama Elly Shop, Mwanjelwa Market. Mbeya	Mama Elly	Trader	(0)754 070439	
44		Raphael Group Ltd (Rafa), Uyole Industrial Area, Plot 1, Block 1, Mbeya	Ndelwa, Raphael	Managing Director	(0)784 409340	www.rafaagrouplimited.com
45			Mwakipesile, Lazaro	General Manager	(0)764 465125 (0)659 661866	Mwakipesile.lazaro@ymail.com
46	May 21st	Kilombero Market, Arusha	Sharifa Ayelo	Market Manager	0754244880	
47	16 th May	TAHA, Arusha	Reuben G. Hizza	Market Assistant	0715180789	Reuben.hizza@taha.or.tz
48	16 th May	TFA, Arusha	Asha Nasib	Assistant Sales and Marketing Manager	0786438973	
49	24 May	REPOA, Tanzania	Donald Mmari	Executive Director	0713232323	mmari@repoa.org
50	27 th May	PASS, Mtwara	Isaac Kileo	Branch Manager	0755959593	kileo@pass.ac.tz
51	27 th May	MAMCU, Mbeya	Kelvin Rajabu	General Manager	0712932080	
52	27 th May	WABISOCO, Mtwara	WABISOCO members	Managemnet Team		
53	1 st July	Crop Promotion Department	Agnes	Acting Director	0713533622	



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SERA Training on Agricultural Commodity Market Analysis

Course Outline (as delivered) July 12-15, Bagamoyo, Tanzania

Instructors: Don Mitchell, SERA Senior Advisor, Varun Kshirsagar, Consultant, and Edith Lazaro, SERA Research Associate

Tuesday July 12

9:00-9:45 Welcome, Introductions, Agenda, and Student Survey - Don

Survey of student backgrounds and knowledge of economics, statistics, and computer skills.

Objectives: Training will teach students how to analyze commodity markets in order to inform Government about the food crops situation in Tanzania, and the regional and global markets.

Course Material: Training will focus on analysing grains (maize, rice and wheat), oilseeds, and sugar, and will include basic economic principles, statistics, sources of data and information, global food markets, regional and national markets, skills training in word, excel and power point, and preparing a report and power point presentation for management.

9:45-10:30 Basic Economic Principles – Don

Basic Economics for Analyzing Commodity Markets: demand, supply, price and income elasticities, impact of droughts, price controls, trade restrictions.

10:30-11:00 Coffee/Tea Break

Payment of Per Diem

11:00-12:00 Global Grain Markets, Monitoring, Analysis and Trends – Don

Analyzing Global Grain Markets: sources of data/information, trends in production/consumption, stocks and stocks/use ratios, and prices.

USDA FAS PSD online database. Downloading, organizing and presenting the data.

World Bank Commodity Price Data and Forecasts.

Summarizing the Information for Management in Bullet Points and Charts

12:00-12:30 Food Consumption Patterns in Tanzania –Don

Food consumption, calorie shares, prices, and food basket costs by region.

12:30-13:30 Lunch

13:30-15:00 Skills Training - Edith

Review of Microsoft Excel and charts

15:00-15:30 Coffee/Tea Break

15:30-17:30 Student Work Period

Analyzing the World Maize, Wheat and Rice markets

Wednesday July 13

9:00-10:30 Statistical Analysis – Varun

Mean, variability, correlation, analyzing data in levels vs. percent changes

10:30-11:00 Coffee/Tea Break

11:00-12:00 Statistical Analysis for Food Markets - Varun

12:00-12:30 National and Regional Grain Markets - Don

Monitoring Regional Production and Import Requirements

Data Sources: FAO, FEWS NET, GIEWS

12:30-13:30 Lunch

13:30-15:00 Commodity Market Report-Edith

Review of Word, Creating a Title Page, Formatting, Transferring a chart from Excel to Word

15:00-15:30 Coffee/Tea Break

15:30-17:30 Student Work Period

Preparing the Commodity Report

Thursday July 14

9:00 – 9:30 Global Sugar Markets, Monitoring, Analysis and Trends – Don

Analyzing Tanzanian Sugar Markets: policies, sources of data/information, trends in production/consumption, stocks and stocks/use ratios, and prices.

Downloading data from FAS PSD and charting the data.

9:30 - 10:00 Regional Food Markets - Don

Sources of Information and FAO/FIEWS/NFRI/WFP

10:00 – 10:30 Tanzanian Food Markets - Don

Current Situation and Implications of Regional Markets

10:30-11:00 Coffee/Tea Break

11:00-12:30 Statistical Analysis - Varun

Continued

12:30-13:30 Lunch

13:30-15:30-17:30 Student Work Period

Students organized into three teams to prepare their Commodity Market Report

Friday July 15

9:00-10:30 Student work period

10:30-11:00 Coffee/Tea Break

11:00-12:30 Presentations of Reports by Teams

End-of-Training Survey

12:30-13:30 Lunch

13:30 Depart for DSM

SERA Training on Agricultural Commodity Market Analysis

List of Documents

East Africa Grains Council (EAGC) Marketing Information System (MIS) RATIC online data

FAO Crop Prospects and Food Situation, Quarterly Report, June 2016

FAO Food Outlook, Biannual Report, June 2016

FAO FPMA Food Price Monitoring and Analysis, Monthly Report, June 9, 2016

FAO Global Information and Early Warning Systems (GIEWS) , Monthly Report, June 2016

FEWS Net – Famine Early Warning Network www.fews.net

USDA Foreign Agricultural Service, www.fas.usda.gov

USDA Grain: World Markets and Trade, monthly report, June 2016

USDA Oilseeds: World Markets and Trade, monthly report, June 2016

USDA FAS Production, Supply and Distribution, online database, July 2016

USDA Sugar: World Market and Trade, monthly report, May 2016

World Bank, Commodity Markets Outlook Quarterly Report, April 2016

World Food Program, Monthly Price Data Analysis, <http://foodprices.vam.wfp.org/Analysis-Monthly-Price-DataADV.aspx>

STAPLE MARKET Bulletin

July 2016

Rapid Food Market Assessment in Tanzania: Focus on Maize and Rice

Plate 1: Maize bags stored in one of grain millers in Arusha region



Plate 2: Traditional maize grading techniques in Ruvuma region



KEY MESSAGES

- Maize and rice (paddy) production is forecasted to be 6,000 and 2,400 thousand MT respectively for 2015/16 season
- There are indications that the 2015/16 El Niño episode might result in overall maize and rice surplus in the Southern Highlands but pockets of the grain deficit in the North and Northeastern regions; necessitating government preparedness to mitigate the negative effects
- Any grain trade opportunity has to be carefully managed in view of the food situation in ESA and the risks of over-issuing export permits (vibali) on food security
- The best strategy for dealing with the current food situation is to maintain an open border, regulated and transparent trade to induce 2016/17 season production and maintain price stability
- In the meanwhile, NFRA has to be financially capacitated to timely procure and store sufficient grain for national needs
- Better farming techniques and infrastructure; roads and warehouses need to be improved so as to increase productivity and reduce post harvest losses

Global Cereal Situation

Global cereal production (Table 1) shows a marginal 0.6 percent improvement in grain production between 2015/16 and 2016/17 forecast. The 2016/17 forecast is 0.78 percent fall compared to the record high global cereal output reached in 2014/15. The 2016/17 forecasts for cereal production in LDCs is down by 0.3% from 1456 million MT estimated in 2015/16. The forecast for 2016/17 show a 1.9% reduced global cereal trade compared to 2015/16 trade estimates. Overall, the global grain price in 2015 is at 160USD per tonne, the lowest since 2010 but is projected to gradually increase especially in areas that have been hard hit by El Niño weather (FAO, 2016).

Table 1: Global Cereal Situation (Million MT)

	2014/15	2015/16	2016/17	Change: 2016/17
PRODUCTION		Estimate	Forecast	over 2015/16 (%)
World	2,562.80	2,528.60	2,542.90	0.6
Developing countries	1,453.70	1,455.90	1,451.90	-0.3
Developed countries	1,109.10	1,072.70	1,091.00	1.7
TRADE				
World	376	376.3	369.1	-1.9
Developing countries	114.1	130.6	123.1	-5.7
Developed countries	261.8	245.7	246	0.1
UTILIZATION				
World	2,502.70	2,524.50	2,546.00	0.9
Developing countries	1,610.40	1,631.00	1,642.00	0.7
Developed countries	892.3	893.5	903.7	1.2
Per capita cereal food use (kg per year)	148.9	148.8	149.1	0.1

Source: FAO, 2016

Maize and Rice Production

Maize production (Table 2) is projected in 2016/17 at 1027 million MT, 2.2% higher than 2015/16 estimates. Utilization of the grain is projected in 2016/17 at 1029 million MT, 2.1% increase from 2015/16 estimates and the same 2016/17 forecast show a 0.1% decrease in maize trade from 133 million MT estimates in 2015/2016.

Table 2: Global Maize Market (Million MT)

Year	Domestic			Trade	Closing
	Production	Supply	Utilization	(Exports)	Stocks
2006/07	706.51	849.36	724.38	87.55	131.43
2007/08	790.37	919.01	786.24	99.7	140.76
2008/09	828.59	969.35	798.54	85.91	163
2009/10	822.94	985.95	822.82	90.05	166.47
2010/11	852.94	1019.41	868.18	97.03	151.14
2011/12	887.51	1038.65	875.7	103.06	162.31
2012/13	871.67	1033.99	886.3	102.96	154.7
2013/14	1014.97	1170.68	962.25	124.99	189.31
2014/15	1034.09	1223.4	997.11	128.76	222.99
2015/16	1004.06	1227.06	1007.11	132.49	219.6
2016/17	1026.52	1246.12	1029.23	131.04	214.16

Source: FAO, 2016

Rice production (Table 3) is projected in 2016/17 at 494 million MT, 0.8% higher than 2015/16 estimates. Utilization of the grain is projected in 2016/17 at 503 million MT, 1.4% increase from 2015/16 estimates and the same 2016/17 forecast show a 1.3% decrease in rice trade from 44.7 million MT estimates in 2015/2016.

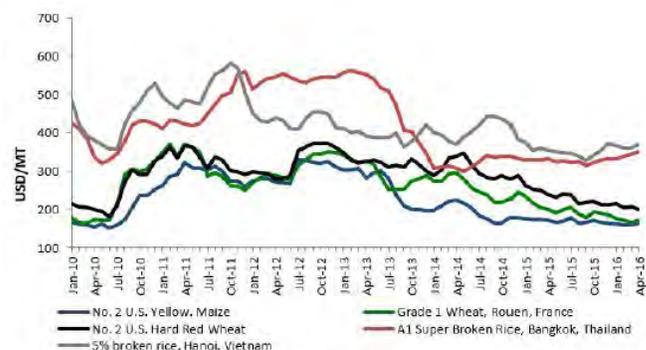
Table 3: Global Rice Market (Million MT)

Year	Production	Supply	Utilization	Trade	Ending stocks	World stock-to-use ratio	Major exporters' stock-to-disappearance ratio
2006/07	425.4	520.2	422.9	31.6	95.3	24.8	13.7
2007/08	436.0	531.3	432.1	30.2	99.6	26.0	15.8
2008/09	457.4	557.0	442.5	29.9	118.0	29.3	22.4
2009/10	453.8	571.8	446.8	32.1	124.2	30.0	21.9
2010/11	466.9	591.2	459.7	36.7	130.0	27.8	21.2
2011/12	483.5	613.5	467.2	40.4	146.4	30.9	25.1
2012/13	488.2	634.6	473.1	40.1	161.3	33.4	27.8
2013/14	494.5	655.7	482.8	45.5	172.4	35.1	28.9
2014/15	494.4	666.7	491.5	44.6	173.9	35.0	23.9
2015/16	490.1	664.0	496.4	44.7	168.9	33.6	18.2
2016/17	494.4	663.3	502.6	44.1	163.8	32.0	14.7

Source: FAO, 2016

Global food market trends in selected markets (Figure 1) show that maize and rice prices had a rising trend between October 2015 and April 2016. Maize prices had three peaks in January 2011, October 2012 and April 2014 at above 300USD per tonne before falling sharply to between 150-200 USD in US and French markets. Rice prices which were also on a rising trend between 2010 and 2011 peaking in October 2011 at 600USD per tonne stabilized in US market up to April 2013 but sharply declined both in US, Thailand and Vietnam markets to about 300USD per tonne. Rice prices have shown a rising trend averaging 300-400USD per tonne between May 2015 and April 2016 in US and Vietnam markets.

Figure 1: Global Food Market Trends



Food and Agriculture Organization of the United Nations (FAO), World Bank.

Source: FAO, 2016

The current 2015/16 El Niño episode has produced differentiated and localized impacts on cereal production across the world and without trade linkages and trade openness most drought and flood hit countries could face serious grain shortages (IFPRI, 2016). Argentina, Pakistan, India, Vietnam, the Horn of Africa, Malawi, Zimbabwe and South Africa have reported localized El Niño cereal shortfalls (IFPRI, 2016, WFP, 2016, FAO, 2016). In El Niño hard hit developing countries reliance on global cereal trade might not be helpful due to weak world price transmission caused by price controls and, in Latin America due to white maize preference instead of the traded yellow maize. Global price transmission in SSA will have muted effects on domestic markets due to weak global trade integration.

ESA Cereal Outlook

Cereal production for Eastern Africa (Table 4) is projected to be 44.5 million MT in 2016, representing a 1.4 percent change from 2016/15 estimates. Cereal production in Ethiopia whose drought hit Berg region has reported grain shortfalls, is projected to be 20.8 million MT, a 2.5 percent increase from the 2016/15 estimates while Sudan's cereal production is forecasted (2016) at 4.5 million MT, a 30.3% change from 2016/15 estimates. In Uganda cereal production forecast for 2016 is at 3.5 million MT, a 3 percent increase compared to 2016/15 estimates while Tanzania's cereal forecast (2016) show a 0.5 % increase from 2016/15 estimates. Kenya's cereal forecast for 2016 is at 4.3 million MT, a 4.8 percent decline compared to 2016/15 estimates (FAO, 2016).

Table 4: Cereal Production in Eastern Africa

Countries	2014	Wheat		2014	Coarse grains		2015		Total cereals		Change 2016/2015 (%)
		2015 estim.	2016 fcast.		2015 estim.	2016 fcast.	2015 estim.	2016 fcast.	2016 fcast.		
East Africa	5.3	4.7	4.8	44.1	36.1	36.5	52.7	43.9	44.5	1.4	
Ethiopia	4.2	3.6	3.7	19.2	16.6	17	23.6	20.3	20.8	2.5	
Kenya	0.3	0.4	0.4	3.9	4	3.8	4.3	4.5	4.3	-4.8	
Sudan	0.5	0.5	0.5	7.4	2.9	4	7.9	3.4	4.5	30.3	
Tanzania											
U.R.	0.2	0.1	0.1	7.9	7.2	7.2	10.7	9.7	9.7	0.5	
Uganda	0	0	0	3.3	3.2	3.3	3.6	3.4	3.5	3	

Source: FAO, 2016

Production of cereals in Southern Africa (Table 5) is projected at 24.0 million MT in 2016, a -17.3 percent change from 2016/15 estimates. South Africa, the region's grain basket, is projected to produce 9.4 million MT of cereals in 2016, a -25.4 percent change compared to 2016/15 estimates. Production in Malawi, which has already imposed a maize export ban since June, 2016 is projected to be 2.6 million MT, a -13.6 percent change from 2016/15 estimates.

Table 5: Cereal Production in Southern Africa

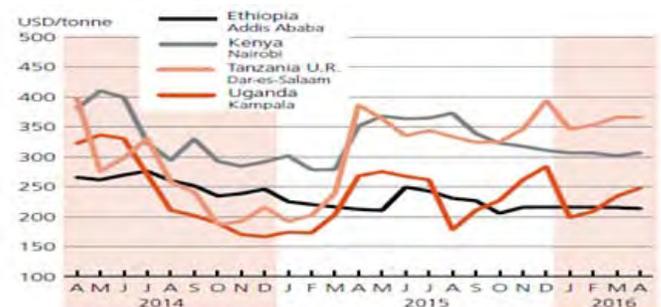
	Wheat			Coarse grains			Rice (paddy)			Total cereals			Change: 2016/2015 (%)
	2014	2015 estim.	2016 fcast.	2014	2015 estim.	2016 fcast.	2014	2015 estim.	2016 fcast.	2014	2015 estim.	2016 fcast.	
Southern Africa	2.0	1.7	1.9	28.9	21.7	17.8	4.6	4.3	4.3	35.6	27.7	24.0	-13.6
- excl. South Africa	0.3	0.3	0.3	13.4	10.6	10.0	4.6	4.3	4.3	18.2	15.1	14.5	-3.7
Madagascar	0.0	0.0	0.0	0.4	0.4	0.3	4.0	3.7	3.8	4.3	4.1	4.1	0.7
Malawi	0.0	0.0	0.0	4.1	2.9	2.5	0.1	0.1	0.1	4.2	3.0	2.6	-13.4
Mozambique	0.0	0.0	0.0	1.6	1.5	1.5	0.4	0.4	0.3	2.0	1.9	1.9	-1.6
South Africa	1.8	1.4	1.6	15.6	11.2	7.9	0.0	0.0	0.0	17.3	12.6	9.4	-25.4
Zambia	0.2	0.2	0.3	3.4	2.7	2.9	0.0	0.0	0.0	3.7	3.0	3.2	7.5
Zimbabwe	0.0	0.0	0.0	1.7	0.8	0.7	0.0	0.0	0.0	1.8	0.9	0.7	-17.1

Source: FAO, 2016

Maize prices in Eastern Africa (Figure 2) have shown mixed trends since 2014 ranging from 250 USD per tonne in Ethiopia to 400USD per tonne in Kenya in April 2014 before experiencing a general decline from June to December 2014. Maize prices in the region began to show

per tonne but gradually declined both in Tanzanian and Ethiopian markets.

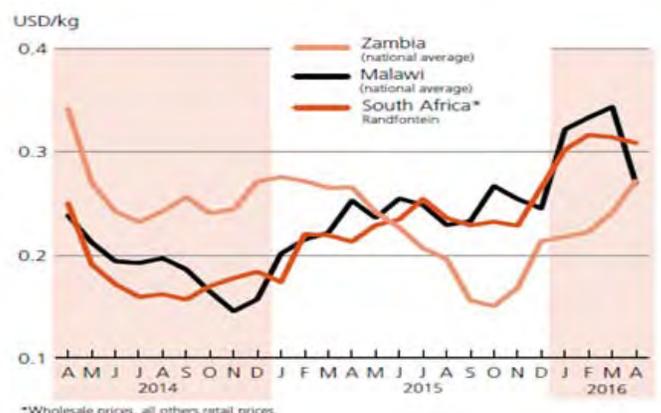
Figure 2: Maize Prices in Selected Eastern Africa Markets



Source: FAO, 2016

There was a general drop in maize prices in Southern Africa (Figure 3) from May to November 2014 and continued to fall in Zambia between May and October 2015. Prices in the region have shown an upward trend in Malawi, Zambia and South Africa peaking in Malawi at slightly over 300USD per tonne but declined sharply in that country to almost 250USD per tonne in April 2016. Prices in Zambia and South Africa have shown an increasing trend between January and April, 2016.

Figure 3: Maize prices in selected Southern Africa markets

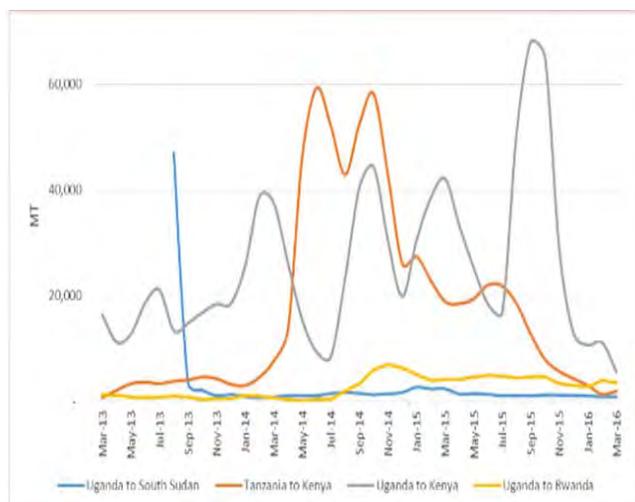


Source: FAO, 2016

Cross Border Grain Trade in Eastern Africa

There is a thriving legal and illegal grain trade in the Eastern Africa region which is influenced by the grain availability both in source and destination markets and by tight supply of the grain in some markets (FEWSNET, EAGC, 2016). The commonly traded commodities are maize, sesame seed, rice, dry beans, sorghum, wheat flour and sugar (Figure 4)

Figure 4: Formal and Informal Cross Border Grain Trade in Eastern Africa.



Source: FEWSNET and EAGC, 2016

Figure 4 show a sharp increase in maize trade between Tanzania and Kenya reaching a peak of 60,000 MT around June but peaked once more in October, 2014 and gradually fell to below 20,000 MT in March, 2015. The other significant cross border trade is between Uganda and Kenya which has averaged above 20,000MT throughout the period, except for the period between May and July 2014 when it leveled below 10,000MT but peaked once more between September and October, 2015 at over 40,000 MT before falling sharply thereafter to just above 5,000 MT but increased significantly thereafter to over 60,000MT during the remaining period of 2015. Cross border trade between Rwanda and Burundi and the rest of EAC countries has been at low levels.

Cross border trade between Uganda and Southern Sudan peaked in September, 2013 but sharply declined thereafter to just over 1,000 MT. These cross border grain trends are explained by the availability of the maize at source and destination points.

Cereal Market Outlook in Tanzania

Cereal production in Tanzania (Table 6) is forecasted (2016) at 9.7 million MT, 1% increase from 2015 level (FAO/GIEWS, 2016). Maize production is forecasted (2016) at 6 million MT almost at the same level as what was produced in 2015. Rice (paddy) production is forecasted (2016) at 2.4 million MT, 2% increase from 2015. Geographically, the country can be subdivided into four main production zones; lake, central and northern, coastal and southern highlands some of which are traditionally food surplus, food self sufficient and food

deficit and have been affected differently by the current 2015/16 El Niño weather (MALFD, 2016).

Table 6: Cereal Production in Tanzania

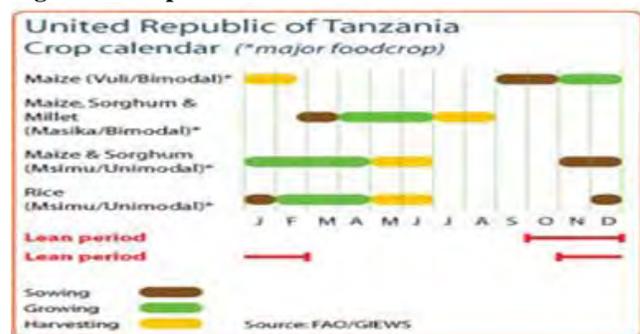
United Republic of Tanzania				
Cereal production				
	2011-2015 average	2015	2016 forecast	change 2016/2015
	000 tonnes			percent
Maize	5 508	6 000	6 000	0
Rice (paddy)	2 253	2 400	2 450	2
Sorghum	828	820	820	0
Others	452	441	441	0
Total	9 040	9 661	9 711	1

Note: percentage change calculated from unrounded data.
Source: FAO/GIEWS Country Cereal Balance Sheets

Source: FAO, 2016

Cereal production in Tanzania is closely related to a production calendar with two main seasons; unimodal (**msimu**) and bimodal (**vuli**) and affects availability as well as prices. Maize is grown in both seasons running from January to June and from November to December, respectively and is harvested between January and February May and August for the two seasons respectively (FAO/GIEWS, 2016; MALFD, 2016). Rice is mainly grown during the msimu season (February and April) and harvested between May and July (Figure 5).

Figure 5: Crop calendar in Tanzania

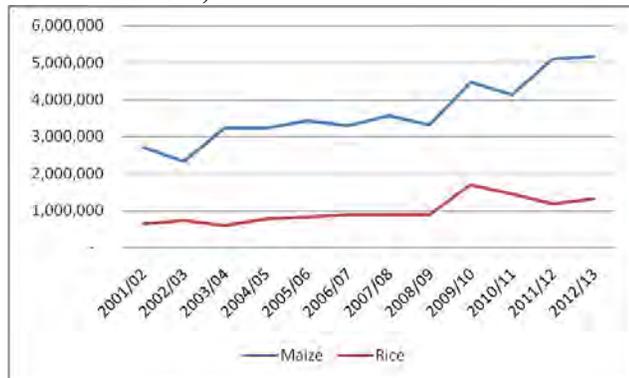


Source: FAO/MALF, 2016

Data from Ministry of Agriculture Livestock and Fisheries (MALF) show historical grain production data from 2001/02 to 2012/13 and is presented in Figure 6

Overall maize production in Tanzania increased by 24 percent between 2010/11 and 2011/12 but slowed down to just over 1 percent between 2011/12 and 2012/13. Rice on the other hand decreased by 19 percent between 2010/11 and 2011/12 but increased by 12 percent between 2011/12 and 2012/13.

Figure 6: Tanzania maize and rice production (2001/02-2012/13)



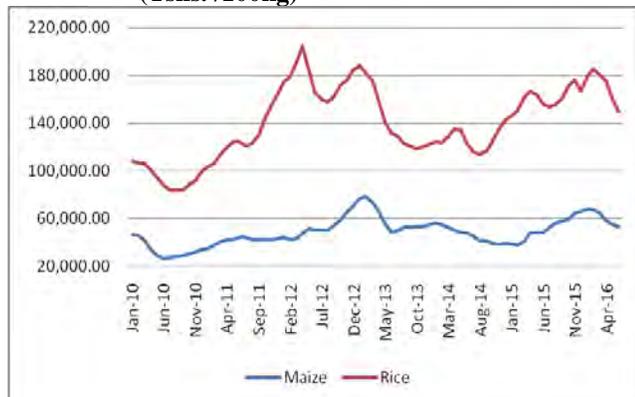
Source: MALF, 2016

Data for wholesale maize and rice prices were collected from Ministry of Industry Trade and Investment (MITI) and show that the rice prices between January 2010 and April, 2015 averaged between Tshs. 100,000 and 180,000 per 100 kg. Rice prices were highest in February, 2012 at Tshs. 200,000 per 100 kg but lowest in August 2014 when it was slightly above Tshs. 100,000 per 100 kg. Increased paddy production and rice import pull-down the rice prices. Upward trend in rice prices resumed in January 2015 and climaxed in April 2016 at Tshs. 190,000 per 100 kg before leveling off thereafter.

Maize prices were on average stable throughout the period Tshs. 50,000 per 100 kg except for two peaks in February 2012 and April 2016 when maize prices were above Tshs. 50,000 per 100 kg (Figure 7).

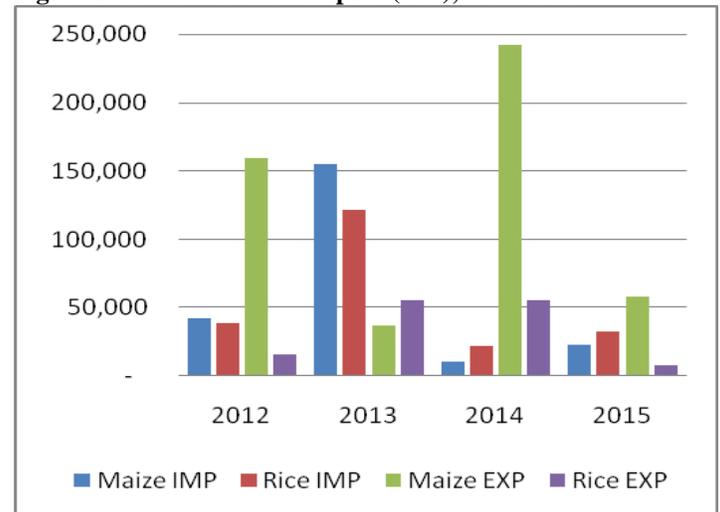
Maize price increased by 0.6 percent between June, 2014 and June, 2015 increased by 10 percent between June, 2015 and June, 2016 due to shortage of supply. The price of rice on the other hand increased by 27 percent between June, 2014 and June, 2015 but decreased by almost 5 percent between June, 2015 and June, 2016 due to increased supply.

Figure 7: Wholesale average maize and rice prices (Tshs. /100kg)



Source: MITI, 2016

Figure 8: Maize and Rice Export (MT), 2012-2015



Source: TRA

Maize exports between 2012 and 2015 have shown mixed trends. In 2012 Tanzania exported about 150,000 MT of maize but exports declined sharply to less than 50,000 MT before rising again about 150,000 MT and declined thereafter to over 50,000 MT. Maize imports were less than 50,000MT but tripled to 150,000MT in 2013 but declined significantly in 2014. By 2015 Tanzania imported less than 25,000 MT of maize.

Rice exports in 2012 were less than 50,000 MT but doubled in 2013 and stayed the same in 2014 but declined to around 10,000 MT in 2015. Rice imports were less than 50,000 MT in 2012 but more than doubled in 2013 but declined in 2014 and increased slightly to over 30,000 MT.

Rice export and import were influenced by availability of the grain and domestic and global prices.

Maize and rice wholesale prices vary slightly within and across zones depending on among other things; availability, quality and transport costs.

Maize prices (Figures 9, 10, 11 and 12) in all zones were on falling trend between March, 2014 and January, 2015. In the same period, maize prices were lowest in southern highlands (Ruvuma) at Tshs. 20,000 per 100 kg but highest in lake, central and northern zones were the average prices were above Tshs. 50,000 per 100 kg. A possible explanation for the lower prices in Ruvuma region was due to bumper harvest during that season. Between March 2015 and January 2016 maize prices were in raising trends in all zones climaxing at Tshs. 65,000 per 100 kg in Southern zone and above Tshs. 70,000 per 100 kg in lake, central and northern zones.

Moshi town recorded the highest maize price increase, 37 percent between June 2015 and June 2016 while Singida town had the lowest price increase of about 4.7 percent in the same period. Dar es Salaam had the highest decrease in maize price of almost 26 percent while Tanga had the lowest decrease, 0.7 percent.

Figure 9: Lake Zone Maize Prices (Tshs. /100kg), 2014-June 2016

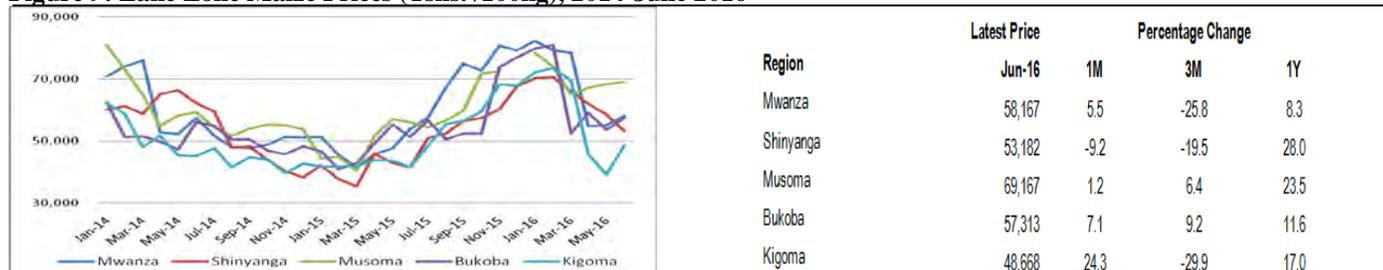


Figure 10: Maize Price Trends in Coastal Zone (Tshs. /100kg), 2014-June 2016

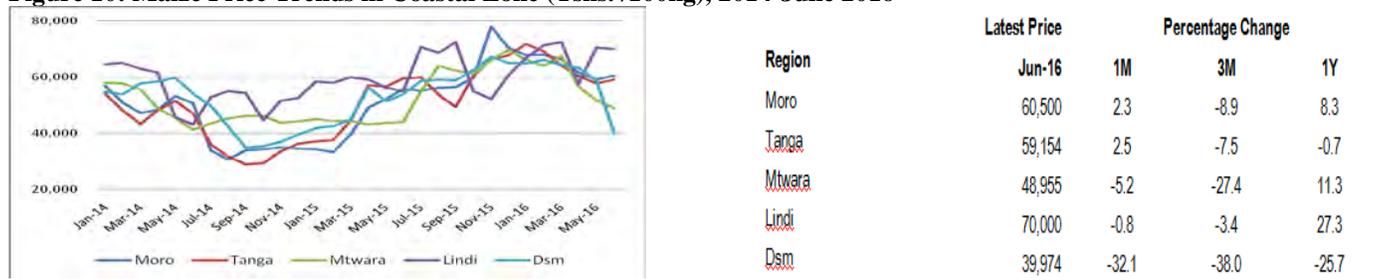


Figure 11: Maize price trends in Southern Highland zone (Tshs. /100kg), 2014-June 2016

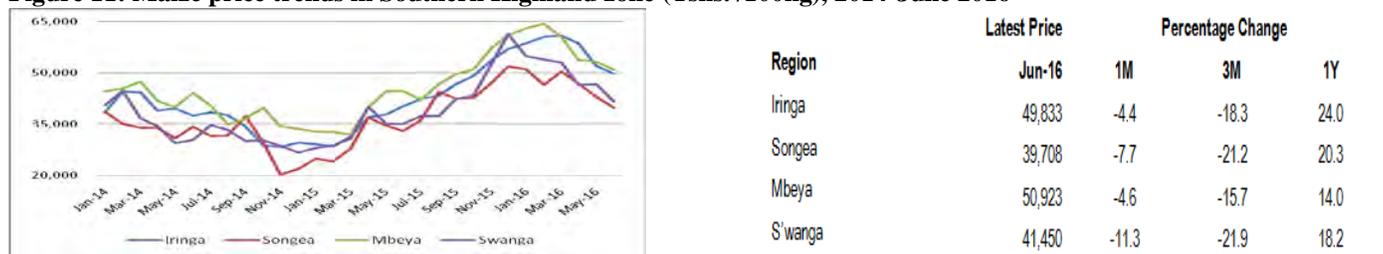
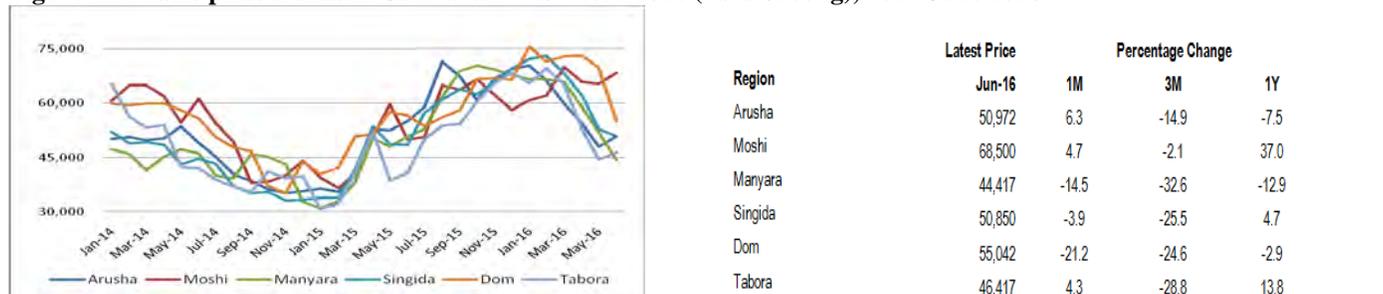


Figure 12: Maize price trends in Central and Northern zone (Tshs. /100kg), 2014-June 2016



Source: MITI, 2016

Rice prices (Figures 13, 14, 15 and 16) in all zones were on raising trend between September 2014 and March 2015 but declined thereafter before raising again in all zones to climaxed at Tshs. 170,000 per 100 kg with a few exceptions like the coast zone were by January 2016 prices were still high at Tshs. 180,000 per 100 kg.

Lindi town recorded the highest rice price increase, 21.7 percent between June 2015 and June 2016 while Dodoma town had the lowest price increase of about 2 percent in the same period. Musoma had the highest decrease in rice price of almost 27 percent while Mbeya had the lowest decrease of almost 2.6 percent.

Figure 13: Lake Zone Rice Prices (Tshs. /100kg), 2014-June 2016

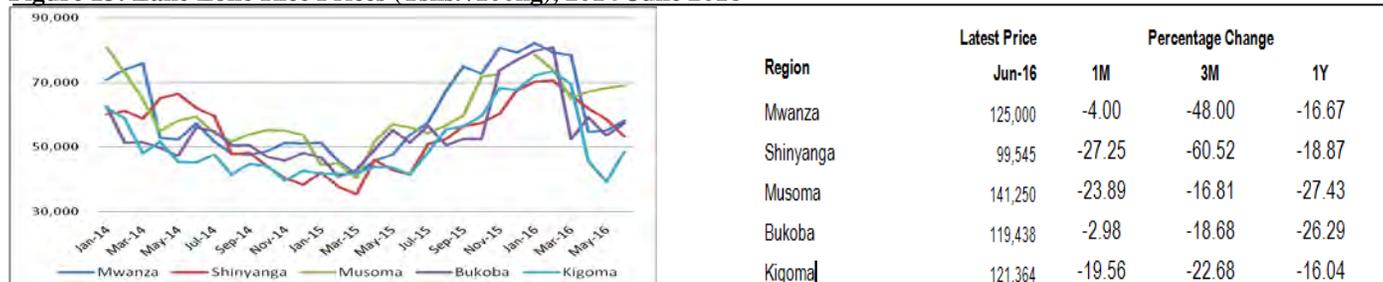


Figure 14: Rice Price Trends in Coastal Zone (Tshs. /100kg), 2014-June 2016

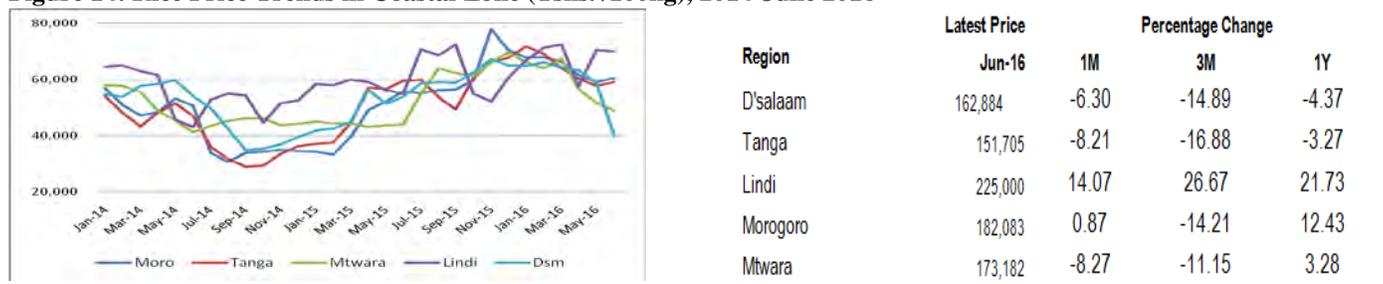


Figure 15: Rice Price trends in Southern Highland zone (Tshs. /100kg), 2014-June 2016

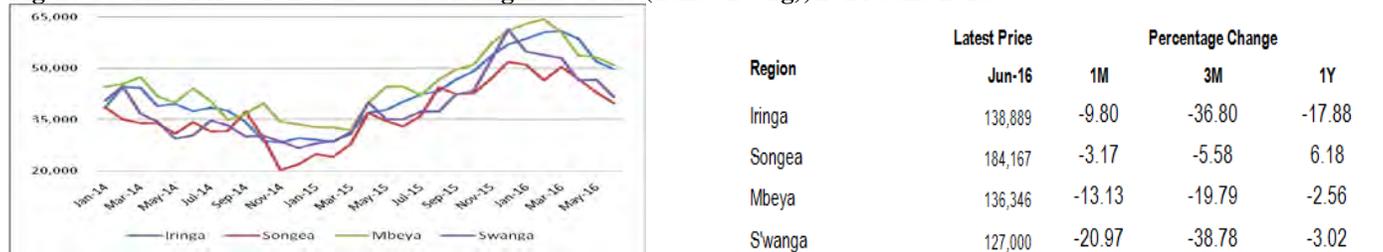
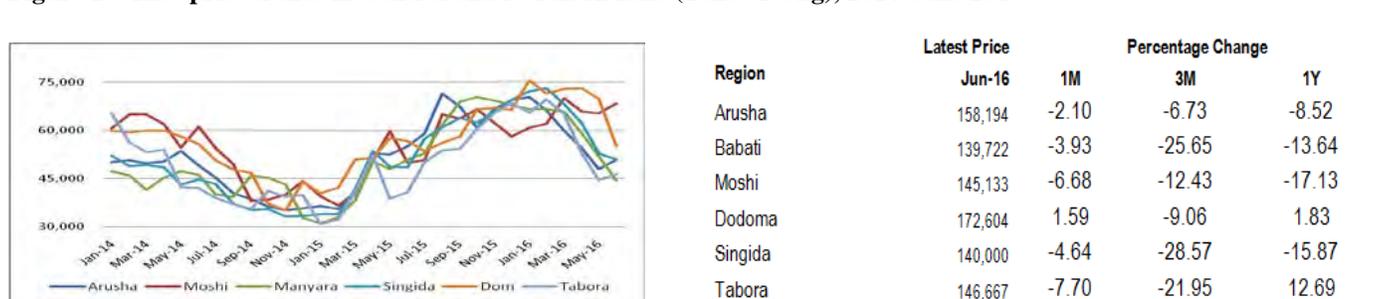


Figure 16: Rice price trends in Central and Northern zone (Tshs. /100kg), 2014-June 2016



Source: MITI 2016

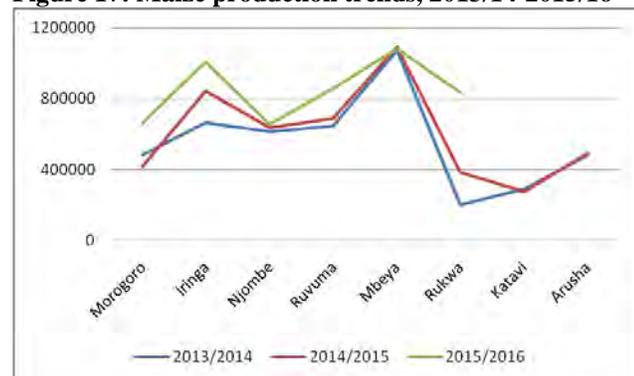
Staples Food Market Assessment: A Rapid Survey

A rapid survey of strategic staple food markets was done in selected major urban centers, production areas, access to stocks, cross border markets, large food traders and in public food stockings to assess the status of maize and rice current harvest to create a countrywide food markets outlook. The checklist included aspects like; 2014/15 and 2015/16 grain production, stocks, price trends, trade flows and volumes and projections for the 2016/17 season and views on adequacy of the current stocks to meet domestic and food demands in the surrounding countries.

The field survey was facilitated by introduction letters to concerned Regional Administrative Secretaries. The rapid nature of the survey necessitated the use of a checklist instead of the questionnaire methodology which would have taken a longer time to collect information on food market situation in Tanzania. The following section presents results of the status of staples market situation in the selected areas.

Overall maize and rice production in the selected regions between 2013/14 and 2015/16 has shown mixed trends (Figure 17 and 18)

Figure 17: Maize production trends, 2013/14-2015/16



Source: MALF 2015, Field Survey 2016

Production in Morogoro region registered a 13 percent fall in maize production between 2013/14-2014/15 seasons but increased its production by 57 percent in the following season. Maize production in the Southern Highlands increased significantly with Rukwa increasing its production by 92.5 percent and up to 115.4 percent in 2013/14-2014/15 and 2014/15-2015/16 respectively. Arusha region had a small increase (2.1 and 3) percent during the two seasons respectively (Table 7)

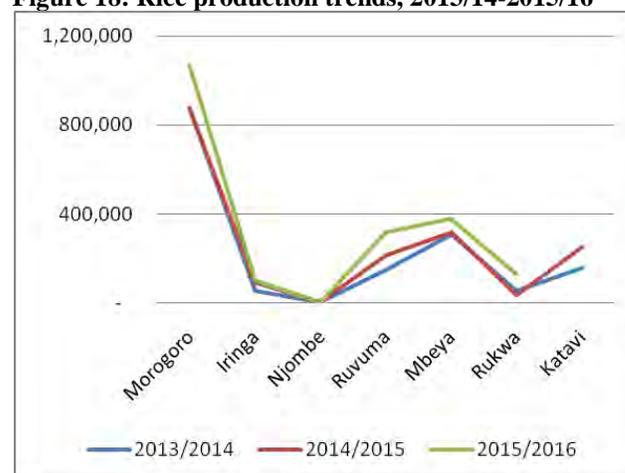
Table 7: Percentage changes in maize production

Region	2013/14- 2014/15	2014/15- 2015/16
Morogoro	-13.3	57.3
Iringa	26.5	19.9
Njombe	4.1	2.4
Ruvuma	6.8	24.4
Mbeya	1.8	-0.7
Rukwa	92.5	115.4
Katavi	-4.0	
Arusha	2.1	3.0

Source: MALF and Authors calculations

Production of rice in Rukwa which had declined by 33 percent in the 2013/14-2014/15 seasons increased its production significantly to 261 percent in the following season. Production of rice in Ruvuma stayed almost the same at 46 percent during the two seasons while Arusha region reduced its rice production from 30 percent in 2013/14-2014/15 to just 2.4 percent in 2014/15-2015/16 reflecting the effects of drought phenomena. (Table 8)

Figure 18: Rice production trends, 2013/14-2015/16



Source: MALF 2015, Field Survey 2016

Table 8: Rice production trends, 2013/14-2015/16

Region	2013/14- 2014/15	2014/15- 2015/16
Morogoro	-0.2	21.9
Iringa	74.8	8.2
Njombe	73.4	-0.2
Ruvuma	45.8	47.0
Mbeya	2.9	18.7
Rukwa	-33.3	261.1
Katavi	62.2	
Arusha	30.0	2.4

Source: MALF and Authors calculations

Food market situation in major urban centers: Dar es Salaam, Morogoro, Arusha and Mwanza

Dar es Salaam is a major grain consuming area while Arusha, Morogoro and Mwanza produce but also consume maize and rice. In Dar es Salaam maize and rice are sold in three main markets; Manzese, Tandale and Tandika. Sources of the grain include Mbeya, Rukwa, Ruvuma, Iringa, Shinyanga, Katavi, Dodoma, Manyara and Morogoro regions. The packaging of maize and rice sold in Dar es Salaam is sometimes done in 100 kg or 90 kg bag.

Overall, maize and rice prices have showed a declining trend since 2014 when a kg of maize was sold at between Tshs. 680 and Tshs. 700 to the current price of between Tshs. 530 and Tshs. 630 respectively. In 2014 the price of high quality aromatic rice from Mbeya and Morogoro regions was Tshs. 1,600 a kg compared to the current price of between Tshs. 1300 to Tshs. 1800. The price of poor quality broken rice has averaged between Tshs. 1,100 and Tshs. 1,200 in 2014/15 and 2015/16 seasons. Maize and rice trade at the three markets is handled by brokers like *Tandika Grain Agency Company* whose storage capacity is not more than 500,000 tonnes at the height of the harvesting season. Grain brokers in Dar es Salaam get rice and maize prices from upcountry contacts in producing regions which indicate that the 2015/16 crop year is likely to face maize and rice shortfalls as a result of El Niño episode. The expected grain shortfall in addition to rising transport costs and brokers margin (Tshs. 10 – 20 per kg) has led to an overall increasing grain prices in Dar es Salaam.

Morogoro region produce and consume maize and rice though the 2014/15 El Niño episode has reduced about 0.3 percent of its 8,004 hectares of agricultural land due to flooding resulting to a decline in overall staple food production (FAO, 2016, RAS, Morogoro, 2016). The region was among the six regions that got FAO support to deal with negative El Niño effects. The El Niño rain distribution explains to a certain extent how maize and rice production was impacted differently in different parts of the country.

Morogoro region received adequate initial masika rains between January and February but suddenly ceased as grains were about to bear fruits hence affecting negatively maize production. The same weather pattern was experienced in the Southern highland, North and Northeast regions except for Njombe and Katavi regions which received normal rains and are expected to have bumper harvests. Rains resumed almost a month later in March but were too late to be of any use to maize due to floods but had a significant positive impact on lowland paddy production in the same regions.

Plate 3: Effects of drought on maize production in Kilimanjaro region



Source: *Mwanachi Newspaper*, 12 July 2016

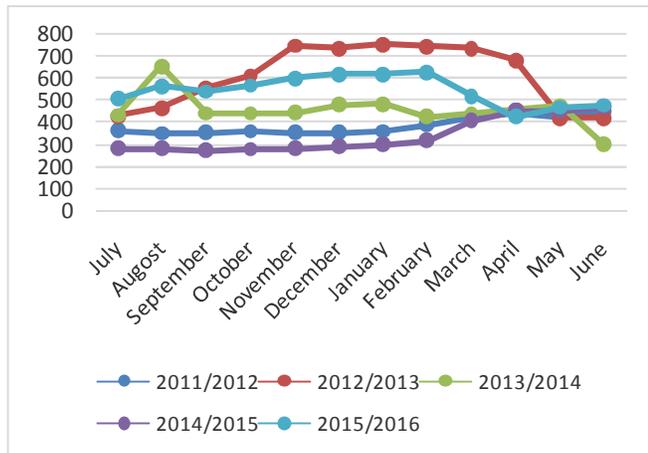
In Kilimanjaro for instance, maize production has been negatively affected as shown in Plate 2 where, a five-acre farm has been completely destroyed due to prolonged drought. The same effects were experienced in Mwanza and Arusha regions.

The 2015/16 harvest season is ongoing although officials predict a reduced grain production due to El Niño as acknowledged by regional and district official as well as by large traders and farmers. Large traders in Morogoro town and in surrounding smaller towns, Dakawa and Mvomero noted among other things that millers are already facing grain shortages due to El Niño and that though the current price of maize ranges between Tshs. 460 and Tshs. 600 per kg the weather effects will exert an upward pressure on prices to even surpass Tshs. 750 per kg recorded during the 2014/15 season. The same reasons are expected to increase the price of rice current ranging from Tshs. 900 to Tshs. 1,100 to over Tshs. 1,300 per kg recorded in 2014/15.

Kibaigwa is state owned maize market in Dodoma region which receive the grain from all over Tanzania for sale within and outside Tanzania e.g. to Kenya, Uganda, Malawi and Zambia. A similar market exists in Tunduma which receive maize and rice from Ruvuma, Rukwa, Mbeya and Katavi regions and sold within the zone and exported to Malawi, DRC, Zambia, Zimbabwe and Burundi.

The current maize price at both markets is Tshs. 460 per kg and is expected to rise due to maize deficits reported in other regions compared to Tshs. 280 - Tshs. 320 per kg reached during the 2014/15 season. Kenyan, Malawian, and Zambian traders, through their agents are reported to be actively purchasing the grain from the markets but are reported to sometimes approach farmers directly something which is likely to result to quality and price distortions. Poor state of infrastructure, agricultural-pastoralist conflicts are reported to affect maize that is sold at Kibaigwa.

Figure 19: Maize Price Trends at Kibaigwa Market



Source: Kibaigwa Market Manager, 2016

Staple Market Assessment in Southern Highland: Iringa, Njombe, Ruvuma and Mbeya

The Southern Highlands zone is the main grain basket in Tanzania and comprises of seven regions; Iringa, Njombe, Ruvuma, Mbeya, Songwe, Katavi and Rukwa.

Iringa region expects to have maize and rice production surplus although with variations between districts. For example, two villages in Iringa district are reported to have received food aid this year due to drought induced El Niño episode (RAS Office Iringa, 2016). During El Niño season some farmers decided to plant paddy and managed to have successful harvests (Cereal Board, Iringa, 2016). Kyela district low land paddy growing areas were negatively affected by El Niño compared to upland areas (Kyela District Office, 2016). The El Niño episode caused areas like parts of Rukwa which had not grown paddy to cultivate it this season. In other districts like Mbarali managed to double their paddy production (Millers Mbarali, 2016). Generally, El Niño favored paddy production but negatively reduced the production of other crops like potatoes (RAS office Njombe, 2016). Overall the Southern Highlands Zone is expected to have food surplus in 2015/16.

Makambako is a dry port in the Southern Highland serving Mbeya, Iringa and Ruvuma regions and had higher grain prices compared to other centers in the zone. The importance of Makambako to this zone will be further enhanced after the completion of Sumbawanga to Tunduma, Mpanda to Uvinza, Mpanda to Tabora and Mpanda to Sumbawanga roads.

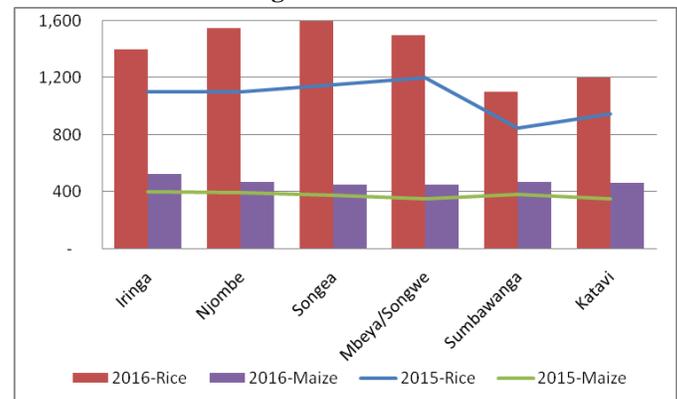
Grain prices observed in the zone are contributed by several factors including competitions from traders due to increase demand from outside regions and neighboring countries. For instance, in 2015 one village in Rukwa region used to have 4 buyers on average but has currently over 50 buyers in July 2016, causing shortage of maize (METL Agent, 2016). Other maize price driving factors include differences in production e.g. in 2016, Mbarali

district had a low price of rice at Tshs. 1,100/kg compared to Tshs. 1,500/kg in Kyela mainly due to availability of grain. The cost of a 100kg bag of paddy was less (Tshs. 38,000 -40,000 Tshs. in Katavi and Tshs. 38,000-50,000 in Rukwa) compared to the price of rice in the southern part of the lake where the price averaged between Tshs. 60,000 and 70,000 per bag.

Maize and rice prices in Southern highland varied significantly among and within districts. In July, 2015 maize prices ranged between Tshs. 350 and 400per kg but systematically increased to Tshs. 460 and 530 per kg in July, 2016. Rice prices on other hand which ranged between Tshs. 830 and Tshs. 1200 in July, 2015 are now trending at between Tshs. 1000 and Tshs. 1600 per kg in July, 2016. High grain demand outside the Southern highlands and reduced availability in some districts are some of the reasons for the surge in grain prices in the southern highlands.

Figure 15, shows trends in maize and rice prices in selected Southern highlands markets in 2014/15 and 2015/16 seasons.

Figure 20: Trends in maize and rice price in selected Southern Highland markets



Source: Field Survey, 2016

In all production regions local and foreign traders (mainly Kenyans) use Tanzanian agents to purchase grains sometimes at above market price to ensure availability of the required grains. Like in the northern zone, the 2015/216 harvesting season is ongoing and will peak in September. In Njombe region the harvest season will peak between August and September where prices are expected to fall as a result of the harvests. Maize prices are expected to fall during this month but with higher rates compared to 2015, the rest of the zone is expecting price increase of both maize and rice until early 2017.

Role of NFRA in grain marketing

The National Food Reserve Agency (NFRA) was established in 1997 and came to effect in 2008. Its mandate is to maintain a national optimal level of food reserve for the country and procure reserve and release food stocks to address disaster. NFRA is also mandated to recycle release

food stocks in the market in order to stabilise food supplies and to market food commodities in order to generate revenue for the government (NFRA, 2016).

The Agency procured 22,335.157 MT of maize during the financial year 2015/16 and is planning to purchase 100,000 MT which is an increase of 348% as compared to previous season (Table 5).

Table 5: NFRA procurement targets in the 2015/16

Area	Procurement Target (MT)
Arusha	15,000
Dodoma	20,000
Kipawa	5,000
Makambako	20,000
Songea	20,000
Sumbawanga	20,000
TOTAL	100,000

Source: NFRA, 2016

Procurement of maize is mainly through buying centers and farmers' groups. Maize prices during the financial year 2015/16 had a minimum price of Tshs. 500,000 per ton and a maximum selling price of Tshs. 530,000 per ton. The price of paddy per tonne was Tshs. 650,000 during the same season (NFRA, 2016).

Table 6: Grain Stock and commitments at NFRA in 2016/17

Product	Stock position as at 24 th July 2016 (MT)	Commitment (MT)	Expected stock position after commitment (MT)
Maize	46,811.833	37.576	46,774.257
Sorghum	19.890	0.000	19.890
Paddy	3,360.884	3,321.254	39.630
TOTAL	50,192.607	3,358.830	46,833.777

Source: NFRA, 2016

NFRA is planning to establish a National Food Balance Sheet approach to accurately assess Tanzania food needs.

In Arusha zone the task ahead of NFRA is to timely purchase available grain as soon as it is harvested to avoid competition from private traders. The longer NFRA delays to purchase grains the more is the likelihood that farmers will sell their produce to private buyers who are currently purchasing maize at Tshs. 460 per kg and the trend is on the rise.

With storage capacity of 39,000 tonnes NFRA purchased and stocked 37,000 tonnes of maize in Arusha zone and sold most of it to TAMISEMI. By July 20, 2016, available maize at Arusha was only 5,000 tonnes. The concern is that this stock is not sufficient to meet grain demands in a drought prone district like Longido. Large grain traders in Arusha including KEN Millers and New Boogaloo Limited purchase process and sell maize and maize flour within

Tanzania and export to Kenya. KEN Millers has recently introduced contract farming with a view to stabilize the availability of quality maize as well as raising farmers' incomes.

Mwanza consumes more maize than rice and is expected to have a bumper rice crop during the 2015/16 season compared to the previous year as a result of higher than average rainfall it received during the season. Maize comes from two districts, Sengerema and Kwimba but overall, the region is projected to have a maize deficit by the end of the 2015/16 season. According to the Mwanza Acting Regional Administrative Secretary, the region has produced only 400,000 MT of food crops this year against the projected amount of 600,000 MT the Citizen Newspaper, 25 July 2016. This translates to a 33 percent decline in food production in the region.

The average price of maize and rice in the region in 2014/15 and 2015/16 ranged from Tshs. 620 to Tshs. 600 per kg compared to Tshs.500 per kg recorder during the 2013/14 season. Currently the price of maize is trending at Tshs. 400 to Tshs. 420.

Staple Market Assessment at Cross Border Posts: Namanga, Sirari, Tunduma and Kasumulu

Sirari, Namanga, Tunduma and Kasumulu are the main border posts between Tanzania and her neighbors (Kenya, DRC, Zambia, Uganda, Rwanda, DRC, Malawi and Mozambique). According to TRA, a substantial official trade exists between Tanzania and its neighbors. The trade is facilitated through export permits issued, upon request by the MALF. According to our survey exports permits valued around 11,780 MT were issued to traders from Southern highlands and were to be used for trade between April and August, 2016 to export maize, rice and beans via Kasumulu and Tunduma boarders. About 466 MT are reported to be transported to Kigoma via Kasanga port between January and April, 2016 are anticipated to be exported to Burundi and Congo DRC.

The total volume of maize and rice exported to Kenya during January to June, 2016 through Namanga and Sirari borders were 8,715 MT, out of which 7,985 MT were maize and 730 MT was rice (TRA-Namanga and Sirari, 2016). The value of maize and rice exported through permits was not available at the time of the survey.

During the time of the survey there was a bit of confusion on whether the permits already issued had ceased or not and exporters were awaiting official clarification from responsible authorities.

There were reports of flourishing illegal cross border trade between Tanzania and her neighbors which is difficult to control because of the porous nature of the borders, high demand of the grain in the destination areas and availability of the grain in the country.

Voices of Grain Producers and Traders

The survey also heard “voices” from grain producers and traders which could have direct or indirect impact on grain availability and prices as follows:

- Scarcity or absence of grain storages. In all major markets maize and paddy is stored in open spaces and hence vulnerable to rain and impurities
- Poor infrastructure including rural roads. Rural roads are completely destroyed after Masika rain season
- There is flourishing illegal cross border grains trade in almost all border posts
- There is confusion on status of grain export permit. Traders do not know what is happening
- Crops cess is still problematic to most domestic grain traders
- There is confusion in grain packaging, e.g. the use of both 108kg and 90kg of bags are used
- The hand hoe is still the main farm implement which lower productivity
- Use of storage pesticide directly to the grains which could endanger human health
- Peasants limited use of Meteorological information in agriculture
- Untimely delivery of input subsidies
- NFRA should buy grain from village centers to prevent farmers’ exploitation

Drivers of cereal prices in Tanzania

The synthesis of the various reports complemented by field survey including voices from producers and traders point to the following main drivers of maize and rice prices in Tanzania;

• Grain availability

In Tanzania’s grain availability is influenced by a number of factors including weather, size of the farms, state of technology, amount fertilizer and insecticides used and amount of post harvest loss. Generally, the more maize and rice is available at household level and in markets particularly after harvesting seasons the lower are the prices for these commodities. Conversely, periods of grain scarcity tend to push prices upwards.

• Grain Demand

Grain prices are also influenced by demand factors. Maize is the main staple in many households in Tanzania and in neighboring ESA countries. The current El Niño weather has led to maize shortages in these countries which is likely to lead to increased demand hence increased maize price in Tanzania.

• State of infrastructure

The poor state of infrastructure including rural roads especially in grain producing regions inadequate storage facilities, high dependence on rain fed agriculture tend to reduce grain availability and increase prices

• State of agricultural technology

Most peasants are still using the traditional hand hoe, use no or little fertilizer. This reduces productivity, leading to declining grain production and increased grain prices.

• Quality of the grain

The price of maize and rice in international markets like Kibaigwa and Tunduma is influenced by quality of the grain which is in turn is a function of the state of technology used production and processing. For example, the prices of moisture laden maize, broken rice or insect infested grains is lower than high quality grain.

• Illegal cross border trade activities

There are official reports of illegal grain trade in most of the border posts like Namanga, Sirari, Tunduma and Kasumulu. Regional and district officials note that traders from neighboring Kenya, Zambia, Malawi, Uganda etc. purchase maize and rice directly from farmers which may lead to food shortage and increased prices.

• NFRA Involvement grain procurement

Grain prices are also influenced by NFRA decision to purchase maize and rice in their zones

• Government intervention in Grain market

Government interventions including export bans, cess etc influences the grain prices

Policy Recommendations

The synthesis of various reports e.g. FEWSNET, FAO, WFP, MALFD, MITI and field survey point to the following policy recommendations for addressing food security in Tanzania;

• Coordinated food assistance in food deficit areas

The government has to establish a coordinated system of food assistance to help food deficit regions. This suggests that the actual amount of food assistance required has to be established and procured and methods of food distribution to vulnerable households clearly stated. This would avoid **ad hoc** responses during food emergencies.

• Coordinated ESA response to El Niño

Various reports including IFPRI (2106) and FAO (2016) suggest a possibility of re-occurrence of El Niño weather in the coming seasons suggesting that the region is likely to have grain deficits. This calls for ESA governments to have a coordinated response to such weather and other emergencies

• Maintain open border, regulated and transparent trade

Instead of ad hoc grain export “bans” Tanzania’s plausible strategy to deal with shortages should be to maintain an open border with grain deficit neighboring countries. Such a measure is likely to reduce, if not abolish illegal cross border trade. However, the trade opportunity has to be

regulated and transparent in order to induce grain production and maintain price stability.

- **Increased NFRA capacity and ability to procure and store grain**

The capacity of NFRA to timely procure and store maize and rice has to be improved. This suggests that NFRA has to be adequately financed to facilitate timely purchase of the grains at the beginning of the season. Delays in procurement bureaucracies have to be eliminated and grain sorting and storage facilities have to be in place ready at the beginning of every crop buying season.

- **Improved infrastructure**

There is need to improve infrastructure including rural roads and storage facilities particularly in areas which produce grain.

- **Establish food security database**

Efforts by NFRA to establish a food security balance sheet have to be supported so as to create a reliable database.

Annex 10. STATA Training Plan

1. Introduction

The SERA Project is working with the Ministry of Agriculture, Livestock and Fisheries (MALF)-Platform for Agricultural Policy Analysis and Coordination (PAPAC) and Zanzibar Food Security and Nutrition Department (ZFSND) to improve their capacities in policy analysis. The STATA is a commonly used statistical software package used by the GOT and RGOZ for data management, statistical and policy analysis.

2. Training participants and overview of the training

STATA Training is intended for PAPAC, ZFSND and SERA Project staffs who are engaged in research and policy analysis. This activity is being done in collaboration with MSU-PAPAC.

The training will accommodate a maximum of 40 participants divided into two training sessions. Follow-up work and activities may be planned.

3. Methodology

Training approach will be hands on training to enable active participation of the trainees to learn and acquire skills for research and analysis.

Specific activities as per training guide provided in the following link

http://fsg.afre.msu.edu/survey/STATA_13_for_Windows_SAMPLE_SESSION.pdf

- I. Introduction to the Window structures for STATA 13. (Stata Review, Results, Command, Variables and Properties Windows as well as the Do-File Editor). This section must be read before starting the sample session.
- II. Basic functions
- III. Table Lookup & Aggregation
- IV. Tables & Multiple Response Questions and Other Useful Commands
- V. Graphs, tables, publications and presentations, how to bring them into word processor, and use of Survey commands.

4. Training facilitators

This training will be conducted by MSU Consultant assisted by local consultants from reputable Training College.

5. Workshop logistics

The workshop will be conducted at Bagamoyo Oceanic View Hotel and Conference Center. Standard PAPAC training per diem will be provided. .

6. Time frame

The training will be conducted in two sessions each of for 5 days. The first training will be from 6-10 June 2016 and the second from 20-24 June 2016.

Illustrative Schedule:

Stata Short Course on Cross-Sectional Analysis

Day 1 - Monday	
8:30-9:00	Setup of Participant Computers and Distribution of Tutorial
9:00-10:45	Welcome by ???? Introductions Overview of the program for the Short Course. Introduction to the Stata program – Section 0 – File structure used by Stata, organization of menus and explanation of how the help menus work
10:45-11:00	Tea Break
11:00-13:00	Section 1 – Basic functions, Stata files, Descriptives and Data Transformations Discussion of the survey instrument and files that will be used for the tutorial, configuration of Stata, use of multiple datasets in one session (how to manage multiple datasets, syntaxes (do files), output files), commands used to become familiar with a new dataset. Defining datasets and understanding different variable types.
13:00-14:00	Lunch
14:00-15:00	Continuation of Section 1 – Descriptive statistics using only 1 variable
15:00-15:15	Tea Break
15:15-16:30	Exercises using the commands learned.
Day 2 - Tuesday	
9:00-9:15	Short Quiz covering yesterday's material
9:15-10:45	Continuation of Section 1: Descriptive statistics using two or more variables. Transformations of variables. Exercise.
10:45-11:00	Tea Break
11:00-13:00	Section 2: Restructuring data files (table lookup and aggregation). Develop a syntax (do) file to produce a specific output table for a specific research question. Understand the best method to use for this process. Cover Step 1 – new procedure learned is to merge files, select specific cases within the data file and aggregate.
13:00-14:00	Lunch
14:00-15:15	Continuation of Section 2: Cover Step 2 - calculating adult equivalents – creating new variables using information in other variables, transforming or recoding variables, aggregation.
15:15-15:30	Tea Break
15:30-16:30	Exercises to review what has been learned during the day (descriptive statistics, transformations, table lookup)
Day 3 - Wednesday	
9:00-9:15	Short Quiz covering yesterday's material
9:00-10:45	Continuation of Section 2: cover Step 3 – merging files at the same level, compute a new variable, rank cases into quartiles
10:45-11:00	Tea Break
11:00-13:00	Exercise 2.1: Create a table showing calories retained in quartiles by district
13:00-14:00	Lunch
14:00-15:15	Continuation of Exercise 2.1 (if needed).
15:15-15:30	Tea Break
15:30-16:30	Section 3: Tables, multiple response questions and other useful commands
Day 4 - Thursday	
9:00-9:15	Short Quiz covering yesterday's material
9:15-10:45	Continuation of Section 3: Review of Tables commands. Multiple response analysis
10:45-11:00	Tea Break
11:00-13:00	Exercises using the tables and multiple response commands
13:00-14:00	Lunch
14:00-15:15	Section 4: Graphs, tables, exporting data and SPSS output for publications
15:15-15:30	Tea Break
15:30-16:30	Exercises: Multiple response and exploring the graph commands
Day 5 - Friday	
9:00-9:15	Short Quiz covering yesterday's material

9:15-10:45	Section 4: Tables and Graphs, Survey estimation
10:45-11:00	Tea Break
10:00-13:00	Continuation of Section 4
13:00-14:00	Lunch
14:00-15:15	Exercises to firm up the commands learned during the week. Review of the week's short course – focus on questions from the participants and their research
15:15-15:30	Tea Break
15:30-16:30	Discuss on-line materials available for the continuation of building Stata skills, closing of short course



USAID
FROM THE AMERICAN PEOPLE



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

August 22, 2016

Nkawana Magina
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6th Floor, North Tower
Dar es Salaam, Tanzania

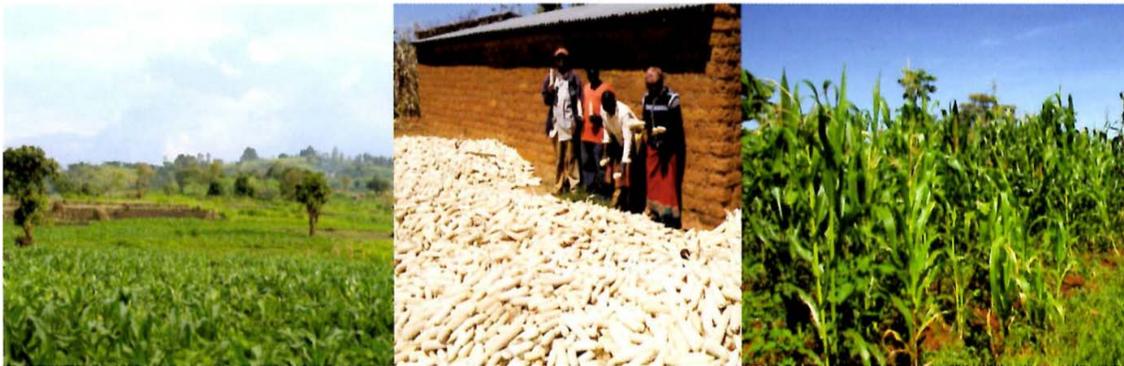
Dear Mr. Magina:

As previously communicated, the USAID-funded Tanzania SERA Project closes on August 30 and we are transitioning the activity on secured transactions reform and development of a collateral registry to the International Finance Corporation of the World Bank Group. We have been informed that the activity will be managed by Mr. Ubong Awag, Senior Financial Sector Specialist of the International Finance Corporation. We are transferring the draft legislation and background material to him and copying him on this correspondence. We sincerely wish you success with this activity and regret that we were not able to complete the activity as part of the SERA Project work program.

Sincerely

Marialyce Mutchler
Chief of Party
SERA Policy Project
USAID Feed the Future
Peninsula House Plot #251
Toure Drive, Dar es Salaam, Tanzania

cc: Hal Cary USAID COR
Ubong Awah, World Bank/IFC



June 2016, Policy Brief No. 6

SERA – World Bank Policy Brief

The Effects of Gender on Maize Production and Marketing in Southern Tanzania¹

Maize is grown by an estimated 80% of farmers in Tanzania and about 20% of those farmers are in female-headed households. Most of these females were widowed or divorced and are disadvantaged compared to male-headed households with respect to knowledge of production practices, land holdings, use of improved inputs, yields, and prices received for marketed maize. Better understanding of these female maize farmers and their characteristics and endowments could help Government, NGOs, and donors provide better services such as extension, access to inputs, and information on marketing and business practices with the objective of raising incomes and reducing poverty. Higher incomes would also contribute to increased food security among this vulnerable segment of the rural population.

The USAID-funded Tanzania SERA Policy Project and the Finance & Markets Global Practice of the World Bank Group engaged TNS Social Research in Nairobi, Kenya to survey 600 male and 600 female maize farmers in four regions of southern Tanzania's maize producing regions. The results of that survey are presented in this report along with recommendations of how to better support female

¹ This Policy Research Brief was prepared by Don Mitchell, Senior Advisor of the SERA Project, in collaboration with Panos Varangis and Valleriya Goffe of the World Bank Group Finance & Markets Global Practice. The SERA Policy Project is a USAID-funded Feed the Future Project that seeks to improve agricultural policies in Tanzania and build capacity for policy analysis and advocacy. It is implemented by Booz Allen Hamilton.
Disclaimer: The views expressed in this Policy Brief are those of the authors and may not reflect the views of USAID, the U.S. Government, the World Bank Group, or the Government of the United Republic of Tanzania.

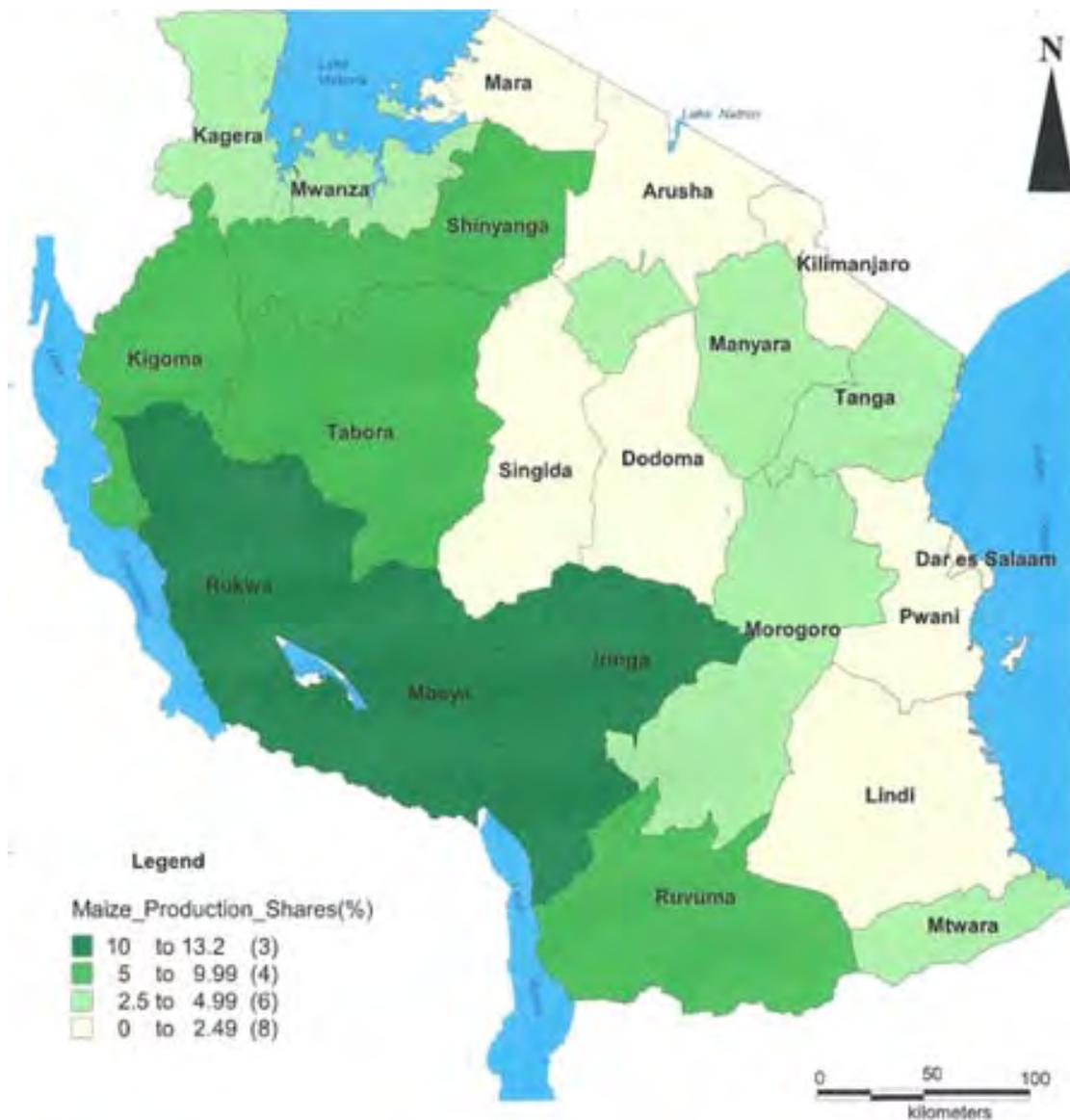
maize farmers. The findings may have implications for female farmers producing other crops in Tanzania who face similar circumstances and for female farmers throughout the region.

Survey of Maize Farmers in Southern Tanzania

A survey of maize farmers in the main producing regions of southern Tanzania was conducted in 2015 to compare male and female maize farmers and identify differences that could be addressed through policy interventions. A total of 1,219 maize farmers were surveyed in two rounds, the first in July during the harvest in Mbeya and Rukwa regions, and the second in Iringa and Ruvuma regions in October after the harvest. The regions were selected to reflect those well connected to the national and regional markets by transportation (Iringa and Mbeya) and those more remote without good transportation linkages to national or regional markets (Rukwa and Ruvuma). The survey in July included 613 maize farmers, of which 314 were male and 299 were female, and the survey in October was of 606 maize farmers, of which 314 were male and 292 were female. Maize producing districts were selected randomly in each region and two or three wards were randomly selected to survey within each district. Local leaders were engaged to identify concentrations of maize producing households, and a random procedure was used to select households to be surveyed. In addition to the household surveys, key informants were interviewed to gain an understanding of the overall situation and focus groups were conducted to refine the questionnaires and obtain qualitative information. The study considered female-headed households as those that were run and represented by a widowed, divorced, or single woman without a husband, father, or male relative involved in the routine day-to-day activities of the household. Male-headed households were those where a husband was present and was the final decision maker on the important issues of the household. Survey results are presented for each region and a weighted average of all regions based on the number of households responding to the survey in each region.

The four regions selected for the survey are located in the main maize producing regions of southern Tanzania and account for approximately 50% of national production (Figure 1). Iringa and Mbeya are better served by roads to urban markets in Tanzania and export markets in Kenya and Mozambique while Rukwa and Ruvuma are less well connected to those markets. The average wholesale maize price during the 2015 harvest was about 60% higher in Iringa and Mbeya than in Rukwa and Ruvuma. That difference would affect profitability of maize production and input use. Consequently, input use was expected to be lower in Rukwa and Ruvuma than in Iringa and Mbeya and that should be reflected in yields.

Figure 1. Maize producing regions of Tanzania and production shares.



Source: USAID.

Demographic Characteristics and Endowments

The characteristics of households obtained from the surveys are shown in Table 1 along with the number of households surveyed in each region. Female-headed households were on average 48 years old compared to 42 years olds for male-headed households. Seventy-one percent of the male maize farmers had completed primary education compared to 53 percent of female maize farmers. Only 7% of males on average had finished secondary education compared to 4% of females. Educational attainment was similar for all regions except Rukwa where the percentage of male and female maize farmers completing primary education was substantially lower.

Ninety percent of male farmers were married as compared to 2% of female maize farmers and this was similar in all regions. Agriculture was reported as the primary occupation of more than 90% of farmers. Sixty-nine percent of women maize farmers were widowed compared to 3% of male maize farmers. A slightly higher percentage of female than male maize farmers reported agriculture as their primary occupation, and only 4% of male and 3% of female maize farmers reported business as their primary occupations. The more well connected regions of Iringa and Mbeya had more male and female maize farmers reporting business as their primary occupation than the more remote regions of Rukwa and Ruvuma and that difference may reflect better off-farm opportunities in Iringa and Mbeya.

Table 1: Demographic Characteristics of Male and Female Maize Farmers.

	----- Total -----		---- Iringa----		----- Mbeya-----		-----Rukwa-----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Number of households surveyed	628	591	162	140	158	153	156	146	152	152
Demographic Characteristics										
<i>Age of Household</i>	42	48	41	49	43	48	40	46	43	47
<i>Primary Education (%)</i>	71	53	73	49	74	50	59	51	76	62
<i>Secondary Education (%)</i>	7	4	12	3	4	2	9	3	4	8
<i>Married (%)</i>	90	2	88	3	89	1	89	3	94	1
<i>Widowed (%)</i>	3	69	3	72	1	72	6	69	1	62
<i>Primary Occupation</i>										
<i>Agriculture (%)</i>	93	96	81	91	96	95	99	99	98	99
<i>Business (%)</i>	4	3	10	7	4	5	0	1	0	0

Notes: Age of household is the age of the household head. Primary and Secondary education is the percent of the household heads that have completed primary and secondary education. Marital status is the percent of households heads who are in each category, and primary occupation is the percent of household heads who list agriculture and business and their primary occupations.

Land quality, size, and tenure arrangements were found to be important determinants of productivity for Ugandan cotton farmers, and many of the differences found among male and female cotton farmers in Uganda were also found among male and female maize farmers in southern Tanzania (Table 2). Female-headed maize growing households in southern Tanzania had only 60% as much land as male-headed households, had less land planted to maize, and slightly fewer female maize farmers had land titles than their male counterparts. There were significant regional differences, with larger land holdings for both male and female maize farmers in Ruvuma region, and more land planted to maize. On average, female maize farmers planted 67% of their land to maize compared to 54% for male maize farmers. Farmers in Mbeya had the smallest land holdings and were relatively diversified with 53% of their land planted to maize for male and 60% for female farmers. Only 13% of male maize farmers and 10% of female maize farmers reported renting land, and the average acres rented for male maize farmers was 2.0 acres compared to 1.7 acres for female maize farmers. A higher percentage of male and female maize farmers in Mbeya and Iringa rented land compared to Rukwa and Ruvuma which

may reflect the relative abundance of land for maize growing in Rukwa and Ruvuma compared to Mbeya and Iringa and therefore the need to rent land in order to expand their farming.

Table 2: Land Holding of Male and Female Maize Farmers.

	----- Total -----		---- Iringa----		----- Mbeya-----		-----Rukwa-----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Land characteristics										
<i>Land Size (acres)</i>	3.5	2.1	3.3	2.2	1.9	1.5	2.9	2.0	5.8	2.8
<i>Land Planted to Maize (acres)</i>	1.9	1.4	2.3	1.8	1.0	0.9	1.7	1.3	2.7	1.7
<i>Land Planted to Maize (%)</i>	54	67	70	82	53	60	59	65	47	61
<i>Land Owned (acres)</i>	3.5	2.2	3.3	2.2	1.9	1.5	2.9	2.2	5.8	2.8
<i>Rented Land (%)</i>	13	10	18	11	19	13	10	9	6	7
<i>Land Rented (acres)</i>	2.0	1.7	2.7	2.1	1.0	1.1	1.7	1.3	2.5	2.6
<i>Land Title Deed (%)</i>	12.5	11.3	19	12	16	14	5	7	10	12

Note: Land rented is the average acres rented for the 13% of male maize farmers and 10% of female maize farmers who rented land.

Input Use

Female maize farmers reported using less improved inputs of all types (Table 3). For seed use, for example, 76% of female maize farmers reported using local varieties compared to 62% of male maize farmers. Only 13% of female maize farmers reported using hybrids compared to 17% of male farmers. The use of hybrid seeds among female maize farmers was especially low in Ruvuma, where only 4% of female maize farmers reporting using hybrids compared to an average of 15% in other regions.

A smaller percentage of female maize farmers used urea and DAP fertilizers than male maize farmers and those female maize farmers who reported using fertilizer reported using less fertilizer per acre. The combined results reported for all four regions were that about half of maize farmers used urea fertilizer compared to about 15% who used DAP. For those farmers who reported using urea or DAP, the average application rate was about 40 kilograms per acre, with female maize farmers using slightly less per acre than male maize farmers. The percentage of farmers who reported using DAP in Rukwa and Ruvuma was too low to allow an accurate estimate of application rates.

More than 90% of farmers reported hiring labor and a slightly smaller percentage of female maize farmers reported hiring labor than males. Only 3% of male maize farmers reported using irrigation compared to 2% of female maize farmers. More female farmers used a hand hoe for land preparation and a smaller percentage used animal traction than male farmers and almost none of the female farmers used tractors for land preparation while some male farmers used tractors. Female maize farmers were less likely to intercrop than male maize farmers which may reflect greater reliance on maize for household food security among female-headed households compared to male-headed

households and the importance of achieving adequate production for household food security. Overall the survey results are consistent with the conclusion that female maize farmers have more limited resources than male farmers and that is reflected in lower input use. Further, input use among both male and female maize farmers in more remote Rukwa and Ruvuma was lower than in Iringa and Mbeya.

Table 3: Input Use of Male and Female Maize Farmers.

	----- Total -----		--- Iringa---		---- Mbeya----		-----Rukwa-----		---Ruvuma---	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Seed Use										
<i>Local Varieties (%)</i>	62	76	69	78	49	67	61	80	68	81
<i>Improved OPV (%)</i>	31	22	17	8	53	37	33	29	18	14
<i>Hybrids (%)</i>	17	13	16	14	20	15	21	17	12	4
Fertilizer Use										
<i>Urea (%)</i>	52	45	57	51	49	47	n.a.	n.a.	49	38
<i>DAP (%)</i>	18	11	42	32	16	11	6	1	5	1
<i>Urea (kg/acre)</i>	43	40	33	35	52	45	n.a.	n.a.	43	38
<i>DAP (kg/acre)</i>	42	39	33	35	55	n.a.	n.a.	n.a.	n.a.	n.a.
Hired Labor										
<i>Hired Labor (%)</i>	92	90	98	96	85	83	87	84	98	98
Land Preparation										
<i>Hand Hoe (%)</i>	76	82	62	65	91	95	56	66	98	99
<i>Animal Traction (%)</i>	20	16	30	26	6	5	41	33	0	1
<i>Tractor (%)</i>	3	0	8	1	2	0	0	0	2	0
Irrigation										
<i>Use Irrigation (%)</i>	3	2	4	6	3	1	3	0	1	0
Cropping Pattern										
<i>Intercropped (%)</i>	77	70	57	46	96	90	91	85	66	59
<i>Pure Stand (%)</i>	23	31	42	53	8	16	10	16	29	39

Note: n.a. (not available) indicates that the number of farmers reporting was too small to provide reliable estimates or that no survey results were available.

Credit

Credit is available to smallholder farmers in Tanzania from a range of institutions and programs (Table 4). However, only 9% of male and 4% of female farmers applied for credit. There were large differences between regions with farmers in Iringa and Ruvuma more likely to apply for credit than farmers in Mbeya and Rukwa. About one-third of both male and female farmers reported no need for credit as the reason for not applying for credit. However, this varied greatly among regions. In Mbeya, for example, 61% of male and 54% of female maize farmers reported no need for credit, and only 6% of male and 3% of female farmers applied for credit. In Rukwa, 16% of male and 13% of female farmers reported no need as the reason for not applying for credit and 42% of male and 35% of female farmers reported that credit services were not available as the reason for not applying for credit. Only 3% of

male and female farmers applied for credit in Rukwa. Of those farmers who applied for credit, most were successful. Among the four regions 95% of male and 83% of female farmers who applied for credit were successful. The two regions where applications were highest also had highest approval rates. In Iringa and Ruvuma, 95-100% of applications were approved while in Mbeya and Rukwa, approval rates were lower which may suggest that lenders in those regions were less strict in their lending requirements.

Table 4: Access to Credit.

	----- Total -----		---- Iringa----		----- Mbeya-----		-----Rukwa-----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Applied for Credit (%)	9	4	19	19	6	3	3	3	11	7
<i>Successful (%)</i>	95	83	100	95	80	100	80	75	95	100
Received Credit (%)	8	3	19	18	5	3	2	2	10	7
Source of Credit (%)										
<i>Groups (%)</i>	26	40	17	28	20	50	40	50	27	33
<i>SACCO (%)</i>	12	23	16	25	10	25	0	25	21	17
<i>VICOBA (%)</i>	15	6	33	12	0	0	0	0	25	10
<i>Commercial Banks (%)</i>	9	4	5	8	10	0	n.a.	n.a.	0	0
Purpose of Credit										
<i>Agriculture (%)</i>	44	38	23	43	30	50	60	25	63	33
<i>Business (%)</i>	34	12	15	18	40	0	20	25	16	8
<i>Household Needs (%)</i>	17	12	20	15	n.a.	n.a.	n.a.	n.a.	13	10
<i>School Fees (%)</i>	12	21	7	27	30	25	0	0	0	30
Reasons for Not Seeking Credit										
<i>No Need (%)</i>	36	33	36	34	61	54	16	13	21	28
<i>No Collateral (%)</i>	17	22	21	38	2	5	25	26	20	20
<i>Service Unavailable (%)</i>	27	20	16	11	6	3	42	35	46	30
<i>Outstanding Loan (%)</i>	10	11	5	4	12	17	20	20	4	3

Note: n.a. (not available) indicates that the number of farmers reporting was too small to provide reliable estimates or that no survey results were available.

Commercial banks accounted for less than 10% of loans to farmers surveyed and there was little difference between male and female farmers. Informal financial service providers, such as the Village Community Banks (VICOBA) and Savings and Credit Cooperatives (SACCOs), offer loans and SACCOs were more popular with female farmers while male farmers were more likely to borrow from VICOBA. There are also donor programs and non-profit organizations, such as One Acre Fund, that offer inputs and training to smallholders. The Alliance for Green Revolution (AGRA) offers financing through the Innovative Financing Program and the Farmer Organization Support Centre for Africa (FOSCA). The Agriculture Inputs Credit Fund established by government is another agricultural finance facility available to farmers. However, formal and informal groups accounted for the largest share of loans to farmers and the survey results indicated that those farmers that received credit from groups most often obtained it through religious groups. Groups were popular among female farmers (accounting for 40% of lending) while male farmers received 26% of their credit from groups, but were also more

diversified in their borrowing than female farmers. There were also differences between regions, with Iringa and Mbeya regions having more diversified credit sources than the relatively more remote regions of Rukwa and Ruvuma.

The primary use of credit was for agriculture, with 44% of male farmers and 38% of female farmers listing agriculture as the purpose of the credit. Male farmers borrowed more often for business (34%) than female farmers (12%) while both male and female farmers borrowed for household needs and school fees. Regional differences were apparent, with male farmers in the more remote regions of Rukwa and Ruvuma more likely to borrow for agriculture than those in Iringa or Mbeya where borrowing for agriculture was a smaller percentage of borrowing and business was a larger percentage.

About one-third of male and female farmers reported no need for credit and both male and female farmers in Mbeya gave this as the main reason for not seeking credit while a much smaller percentage of farmers in Rukwa and Ruvuma gave this reason for not applying for credit. Lack of collateral accounted for 17% of the reasons given for not seeking credit for male farmers and 22% for female farmers. The unavailability of credit services was the most common reason given by both male and female farmers in Rukwa and Ruvuma for not seeking credit but was that was less commonly reported in Iringa and Mbeya.

Sources of Information

Other farmers were reported as the source of information on production, market information, and prices by 52% of female maize farmers and 45% of male farmers (Table 5). Radio was the second most common sources of information followed by mobile phones, but a lower percentage of female farmers received information from those sources than male farmers. Female farmers in more remote Ruvuma reported receiving information from input dealers, NGOs, and Government/Farmer Organizations less often than female farmers in Iringa and less often than male farmers in Ruvuma.

The preferred source of information for both male and female maize farmers was radio, with 69% of male maize farmers and 64% of female maize farmers reporting that as their preferred source of information. The second most commonly reported preferred source of information was face-to-face communication, with 40% of female and 35% of male maize farmers reporting this as a preferred source of information. Farm visits were reported as the preferred source of information by 20% of male and 22% of female maize farmers, respectively, and group discussions, field days, and newspapers, and group meetings were less popular with each accounting for roughly 10% of male and female farmer's survey responses.

The survey responses on marketing reflect the different periods of the surveys with Mbeya and Rukwa regions having been surveyed during harvest and Iringa and Ruvuma regions having been surveyed in October which was after the harvest. Responses showed that farmers had little knowledge of prices or buyers during harvest but acquired that knowledge prior to marketing. Sixty-nine percent of male maize farmers in Iringa and 58% of male farmers in Ruvuma reported having advanced knowledge of prices compared to 52% and 49% of female maize farmers, respectively, in those regions. Prior to harvest, only 5-10% of farmers reported having advanced knowledge of maize prices and no more than 5% reported knowing the buyer.

Regional differences were apparent and farmers in the more remote region of Ruvuma had less knowledge of market prices and were less likely to know the buyer prior to selling. In Iringa, for example, 60% of male and 55% of female maize farmers reported arranging sales in advance compared to 42% and 44% of male and female maize farmers, respectively, in Ruvuma. These lower percentages in more remote Ruvuma may indicate fewer regular buyers who were known to farmers and perhaps the greater prevalence of buyers who came only during harvest periods. Three-quarters of the male farmers reported negotiating prices compared to 70% and 93% of female maize farmers in Iringa and Ruvuma, respectively.

Table 5: Sources of Production and Market Information and Knowledge of Prices.

	----- Total -----		--- Iringa---		----- Mbeya-----		-----Rukwa-----		---Ruvuma---	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Sources of Information										
<i>Other Farmers (%)</i>	45	52	49	60	30	35	58	60	41	52
<i>Radio (%)</i>	43	34	44	40	40	30	35	27	51	38
<i>Mobile Phones (%)</i>	20	18	27	21	13	10	12	12	28	28
<i>Input Dealers (%)</i>	8	5	17	13	5	3	4	1	8	3
<i>NGOs (%)</i>	6	6	10	16	2	1	3	3	9	3
<i>Government/Farmer Organizations (%)</i>	6	6	9	12	1	3	6	5	5	3
Preferred Source of Information										
<i>Radio (%)</i>	69	64	76	78	66	58	62	52	70	68
<i>Face to Face (%)</i>	35	40	48	47	20	31	27	34	44	47
<i>Mobile Phone (%)</i>	36	28	40	24	26	23	40	24	38	39
<i>Farm Visits (%)</i>	20	22	31	39	8	10	8	5	34	32
<i>Group Discussions (%)</i>	11	12	23	24	1	1	8	12	7	14
<i>Field Days (%)</i>	10	13	15	22	7	16	10	12	7	13
<i>Newspapers (%)</i>	11	6	15	6	4	2	5	8	20	9
<i>Group Meetings (%)</i>	8	10	15	19	1	0	7	11	6	9
Knowledge of Buyer and Prices										
<i>Advance Knowledge of Price (%)</i>	74	48	69	52	10	11	5	4	58	44
<i>Knows Buyer (%)</i>	42	57	52	61	4	5	3	2	32	54
<i>Negotiated Price (%)</i>	76	82	75	70	13	14	8	6	77	93
<i>Arranged Sale in Advance (%)</i>	50	49	60	55	10	7	3	3	42	44

Note: The Total results are for Iringa and Ruvuma regions only since they survey in those regions was conducted after the harvest and responses were more reflective of knowledge of buyers and prices when farmers were ready to market their maize.

Maize Production and Yields

The reduced use of improved input, and more limited access to credit and information were expected to contribute to lower yields per acre by female maize farmers than male farmers and the survey

results supported that expectation (Table 6). Female maize farmers had average yields that were 74% of maize yields of male farmers in the four regions, and this varied from a low of 63% in Mbeya to a high of 79% in Rukwa. Farmers in more remote Rukwa and Ruvuma were also expected to have lower yields per acre than farmers in Iringa and Mbeya because of less access to improved inputs and lower output prices and that was generally true with the exception of female farmers in Ruvuma who had higher yields than female farmers in Iringa and Mbeya. Female maize farmers in Rukwa and Ruvuma had yields that were 79% and 82%, respectively, of male farmers yields which was higher than the comparable yields of female versus male farmer yields in Iringa and Mbeya. Female maize farmers also planted only 74% as much land to maize as male farmers. Maize production of female farmers averaged 55% of male maize farmers across the four regions as a result of both less land planted to maize and lower maize yields. The share of production of female farmers compared to male farmers varied from 51% in Ruvuma to 60% in Rukwa.

Table 6: Maize Yields, Land Planted to Maize and Implied Production.

	----- Total -----		---- Iringa----		----- Mbeya-----		-----Rukwa-----		----Ruvuma----	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<i>Yields (kg/acre)</i>	706	522	706	521	766	480	659	518	694	567
<i>Yields (kg/hectare)</i>	1,651	1,222	1,745	1,287	1,689	1,058	1,454	1,143	1,715	1,401
<i>Land Planted to Maize (acres)</i>	1.9	1.4	2.3	1.8	1.0	0.9	1.7	1.3	2.7	1.7
<i>Implied Production (kg/acre)</i>	1,341	731	1,624	938	766	432	1,120	673	1874	964
<i>Female Yield(% of Male)</i>		74		74		63		79		82
<i>Female Land Planted to Maize (% of Male)</i>		74		78		90		77		63
<i>Female Prod (% of Male)</i>		55		58		56		60		51

Notes: Production was not reported in the survey, but was calculated from survey reports of average land planted to maize and yields per survey respondent.

Marketing Maize

On average female maize farmers in Iringa reported receiving 93% of the prices received by male farmers and female farmers in Ruvuma reported received 92% of the prices received by their male counterparts (results were not available for Mbeya and Rukwa). Male and female farmers in more remote Ruvuma received also only 87% and 86% of the prices, respectively, for their marketed maize of male and female farmers in Iringa. Female maize farmers sold only 42% as large of volumes as male farmers in Iringa and 63% in Ruvuma. The combination of lower volumes sold and lower prices resulted in female maize farmers in Iringa receiving 60% as much revenue as male maize farmers and female farmers in Ruvuma received only 47% of the sales revenue received by their male counterparts. Many factors contributed to these substantial differences and the lower prices received by female farmers in Ruvuma were certainly a major contributor, but lower volumes accounted for an even larger share of the decline in female sales revenue compared to their male counterparts. The quality of marketed maize was reported to be slightly higher for male farmers than female farmers, with 38% of male farmers reporting high quality compared to 31% of female farmers.

Access to market information may partially account for lower prices received by female maize farmers compared to their male counterparts, but other factors such as the type of buyer, the quality of the maize and the volumes sold may also influence the prices received. Female farmers reported lower quality for the maize sold and were more likely to sell to consumers than traders than were male farmers. Perhaps this contributed to lower prices received by female farmers if these sales were less commercially oriented or provided as partial payment for services received. Since Mbeya and Rukwa regions were surveyed in July, few households in those regions responded to survey questions on marketing. However, the survey in Iringa and Ruvuma occurred one to two months after harvest and the response rate to the marketing questions was good. Other attributes of maize marketing are reported in Table 7.

Table 7: Maize Marketing, Prices and Sales.

	----- Total -----		--- Iringa---		---- Mbeya----		-----Rukwa-----		---Ruvuma---	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Maize Prices										
<i>Prices Received (TZS/kg)</i>	342	317	364	339	n.a.	n.a.	n.a.	n.a.	316	290
<i>Female Share (%)</i>		93		93						92
Quality of Maize Marketed										
<i>High (%)</i>	38	31	30	26	n.a.	n.a.	n.a.	n.a.	44	36
<i>Medium (%)</i>	52	58	65	64	n.a.	n.a.	n.a.	n.a.	41	50
<i>Low (%)</i>	10	12	5	10	n.a.	n.a.	n.a.	n.a.	15	14
Volume Marketed										
<i>Per HH (kg)</i>	1,491	743	1,731	721	n.a.	n.a.	n.a.	n.a.	1,221	773
<i>Female Share (%)</i>		50		42						63
Buyer										
<i>Small Trader (%)</i>	68	62	67	60	n.a.	n.a.	n.a.	n.a.	69	63
<i>Consumer (%)</i>	20	28	23	25	n.a.	n.a.	n.a.	n.a.	17	30
Maize Price Received										
<i>Small Trader (TZS/kg)</i>	374	347	425	402	n.a.	n.a.	n.a.	n.a.	332	303
<i>Consumer (TZS/kg)</i>	369	378	405	377	n.a.	n.a.	n.a.	n.a.	328	379
Sales										
<i>Marketed Maize (Th TZS)</i>	507	267	499	300	n.a.	n.a.	n.a.	n.a.	513	241
<i>Female Share (%)</i>		53		60		n.a.		n.a.		47

Note: Results were only available for Iringa and Ruvuma which were surveyed after the maize harvest. n.a. indicates that the number of farmers reporting was too small to provide reliable estimates.

Conclusion and Recommendations

A survey of approximately 1,200 maize farmers in southern Tanzania's maize producing region was conducted in July and October of 2015. The survey targeted an equal number of male and female farmers to allow an evaluation of the impact of gender on productivity, marketing and incomes. The results showed that female-headed households were disadvantaged in resource endowments, input

use, and access to credit compared to their male counterparts. On average they had only 60% as much land as male farmers and planted 74% as many acres to maize. They had lower input use and were more likely to use local seed varieties rather than improved OPVs or hybrids. Fertilizer use was about 75% of that of their male counterparts and they were less likely to apply for credit. They had less education and less access to information from those other than farmers. Their yields were approximately three-quarters of male maize farmers. They produced less maize, sold less maize and received lower prices for the maize they sold. On average they received about 92% of the price for the maize they sold as male farmers and the combination of lower land planted to maize, lower yields, and lower prices meant that their revenue from the sale of maize was about half of that of male farmers. Although the study focused on the differences between male and female maize farmers, important observations can be made between the two more well connected regions (Iringa and Mbeya) and the less well connected regions (Rukwa and Ruvuma). The less well connected regions had lower availability of financial services, less information about prices, less prior contact with buyers, and farmers in those regions received lower prices.

Erasing these differences will be nearly impossible, but there are policy actions that can help to reduce the differences and raise yields and revenue from maize for female farmers. More secure land rights would make it possible to benefit from investments in the land without concern that the land use rights are fragile and investments are risky. Social-network based training has been successful in raising yields of low-income farmers in other countries and may help raise female maize farmer's yields in Tanzania. Better market information systems could increase bargaining power of female maize farmers who now receive most of their information from other farmers. Improved investment opportunities, higher demand for improved inputs and adoption of better technologies through training increase yields would stimulate demand for credit. In addition, programs to promote financial literacy and education, as well as strengthening local financial institutions to better reach farmers will contribute to increasing access to finance by both male and female farmers, but even more by female farmers. Finally, the findings of this survey of male and female maize farmers may provide insights into the gender difference that exist in other crops in Tanzania and the region.

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SERA Policy Brief

Rules-Based Transparent System for Emergency Food Imports¹

Tanzania imports large quantities of basic food staples such as palm oil, rice, sugar, and wheat and occasionally has large imports of maize. While imports are needed to meet local demand, they often disrupt domestic markets when quantities imported exceed market requirements or when large imports are authorized by the Government but not anticipated by the private sector. This can lead to price volatility and increased risks for producers, traders, and stockholders. A more transparent and predictable staple foods import policy could encourage increased development of the staple food crops sectors, provide additional tariff revenue to Government, and reduce market uncertainty. It would also reduce the need for ad hoc policy decisions that can lead to regional trade disputes, and provide a more stable market environment for the commodity exchange that is currently being developed.

One of the challenges of implementing an effective staple foods import policy is the difficulty of controlling illegal imports that enter Tanzania from neighbouring countries and through major Tanzanian sea ports. They are illegal in the sense that they don't have import permits as required, and they don't pay the import tariff. The magnitude of these illegal imports is unknown, but they can be estimated by comparing the

¹ This Policy Brief was prepared by Don Mitchell, Senior Advisor of the SERA Project. It summarizes analyses and recommendations of the SERA Project for a Rules-Based Transparent System for Emergency Food Imports. Thanks are extended to the Prime Minister's Office and the Ministry of Agriculture, Livestock and Fisheries for support for this activity. The SERA Policy Project is a USAID-funded Feed the Future Project that seeks to improve agricultural policies in Tanzania and build capacity for policy analysis and advocacy. It is implemented by Booz Allen Hamilton. Disclaimer: The views expressed in this Policy Brief are those of the author(s) and may not reflect the views of USAID the U.S. Government, or the Government of the United Republic of Tanzania.

reported exports to Tanzania from other countries to the imports reported by Tanzania. For example, exports of rice to Tanzania reported by all exporting countries were two to three times as large as imports reported by Tanzania during 2011-2015. That suggests that large imports were unrecorded, but even that may underestimate actual imports because some exports going to neighbouring countries actually get diverted to Tanzania. A similar situation existed for sugar, with exports to Tanzania being reported as about twice as large as imports reported by Tanzania (Table 1). Other staple food crops showed less divergence between reported exports and reported imports.

Controlling illegal imports is difficult because Tanzania has long and porous land borders with neighbouring countries and a long coast which allows easy access for small quantities of food staples. Illegal imports also enter the mainland Tanzanian market through other channels, including transit goods that remain in country and improperly labelled imports that are not detected by customs. However, large quantities of illegal imports are also reported to enter through Tanzania's major sea ports. The loss in tariff revenue from illegal imports is substantial and could provide funding for upgrading customs as well as general budget support. The loss of tariff revenue from rice was approximately 60 million USD per year during 2011-2015 based on the difference between reported exports and reported imports, and the loss of tariff revenue on sugar was approximately 62 million USD per year over the same period. If only one-half of this tariff revenue could be collected in the future, it would be a substantial contribution to the Tanzanian budget.

Table 1: Tanzania's Imports of Staple Foods.

	Years	----- Average Imports (metric tons)-----	
		<i>Reported by Tanzania</i>	<i>Reported by Exporters</i>
Maize	2005-2010	53,936	58,811
	2010-2015	44,358	30,062
Palm Oil	2005-2010	262,931	221,619
	2010-2015	286,789	325,130
Rice	2005-2010	51,402	95,343
	2010-2015	50,747	149,045
Sugar	2005-2010	47,472	109,050
	2010-2015	127,793	275,263
Wheat	2005-2010	708,731	538,193
	2010-2015	855,514	738,117

Source: UN Comtrade.

Tanzania has higher import tariffs on food staples than many of its neighbouring countries and that creates incentives to import staple food crops into neighbouring countries and sell them in the Tanzanian market without paying the tariff. Kenya, for example, has a 35 percent tariff on rice imported from Pakistan while Tanzania has an import tariff of 75 percent. That provides incentives for Kenyan traders to import at the lower tariff and sell in Tanzania. Zanzibar also has a lower import tariff of 12.5% on rice compared to the

mainland and that encourages traders to import more than is required for Zanzibar's consumption and sell the surplus on the mainland. The approximate magnitude of these surplus imports in Zanzibar can be estimated and have been as much as 30,000 tons of rice per year beyond the quantities required to meet domestic demand in Zanzibar.

With such large tariff differentials and the relative ease with which illegal imports can enter by land and sea, it is very difficult to control illegal imports from neighbouring countries. In response to this situation, the Government of the United Republic of Tanzania (GoT) has often relied on quantitative controls and occasional bans on imports of rice and sugar (The Citizen, March 15, 2016) in an effort to control illegal imports. Quantitative controls are implemented by restricting the issuing of import permits; however, Tanzania has not been very effective in monitoring and controlling illegal imports. In some cases, import permits were issued for a specified quantity but actual imports exceeded the quantities authorized. This occurred in 2013 when duty-free rice imports were authorized, but the actual imports were much larger than the quantities authorized and the imports disrupted the domestic market causing prices to fall sharply. There are also reports of import permits being issued for larger quantities than required to balance the market (The Daily News, February 19, 2016) which also disrupts local markets. The longer term consequences of such disruptions are to cause greater price volatility and greater uncertainty for producers and other stakeholders and therefore less investment.

A staple food import policy that relies on established tariffs would be less disruptive to domestic markets, generate greater tariff revenue to Government, and would operate automatically under normal market conditions. It would also be more compatible with policies of the East Africa Community and less likely to create regional trade disputes. However, in order for such a policy to operate effectively, it would be necessary to control illegal imports. Some illegal imports would continue, but more effective monitoring and enforcement of staple foods import policies and tariffs could reduce illegal imports especially through major sea ports.

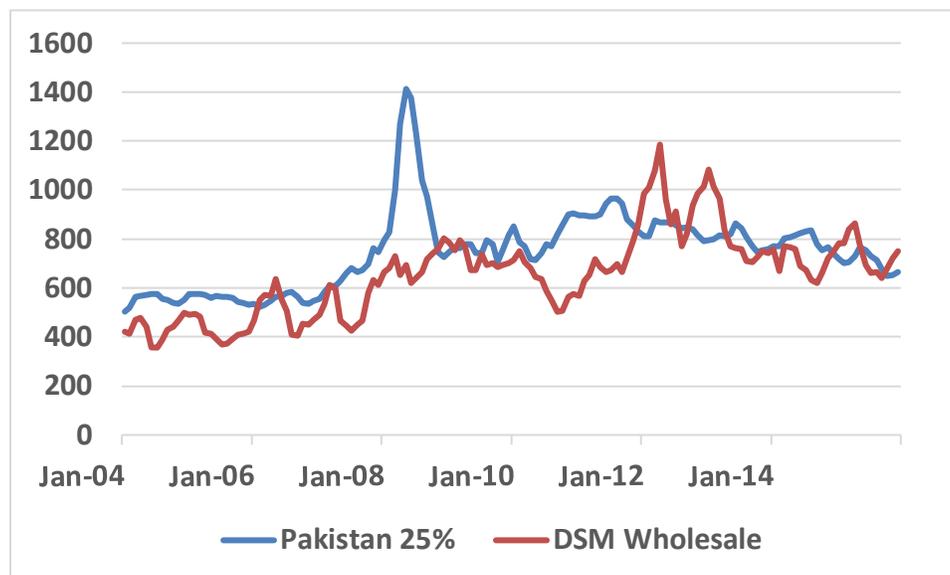
A Market-Driven Staple Foods Import Policy

To illustrate how such a market-driven policy would operate, consider the case of rice imports. Figure 1 shows the domestic wholesale price of rice in Dar es Salaam (DSM) compared to the duty-paid landed price of rice from Pakistan, which is the largest exporter of rice to Tanzania.² The Pakistan import price is higher than the DSM price in most periods and imports would have been unprofitable for the private sector in those periods. However, when the Tanzanian price increased in 2011 and 2012, imports of Pakistan rice would have been profitable and imports would have moderated the domestic price increases in rice. The margin between the domestic rice prices and imported Pakistan rice prices reached USD 170 per metric ton in January 2012 and should have been sufficient to encourage imports and moderate

² The Pakistan rice price is FOB Karachi for 25% broken white rice plus ocean freight, insurance, and handling to achieve a landed Dar es Salaam price in U.S. dollars. The Tanzanian price is the wholesale price from the Ministry of Industry and Trade expressed in U.S. dollars and adjusted for quality to allow comparability with imported Pakistan rice.

further domestic price increases. Instead, domestic rice prices continued to rise and the margin between domestic and imported rice rose to USD 320 per ton by April 2012.

Figure 1. DSM and Pakistan Rice Prices.



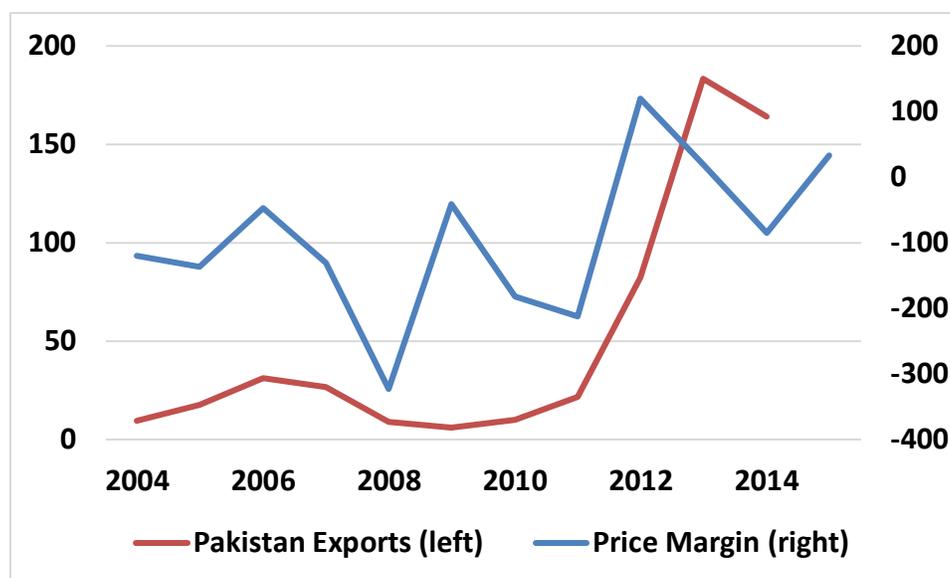
Source: SERA based on Ministry of Industry and Trade and FAO data.

A similar situation occurred in 2013 when domestic prices rose, and the margin between domestic and imported rice rose to USD 285 per metric ton in January 2013. The private sector would have had the incentive to import to moderate the increase in domestic prices and could have done so profitably while paying the 75 percent import tariff. They would have also been cautious to not import more than the market required because that could have caused the price to fall below the level where imports were profitable. The Government would not have needed to intervene in the market and prices would have been moderated by imports. Figure 2 shows Pakistan's rice exports to Tanzania (left axis in thousand metric tons) and the margin between the DSM rice prices and the Pakistan duty-paid landed prices (right axis in USD). When the price margin exceeds USD 100 per metric tons, Pakistan's rice exports increased from less than 20,000 tons to more than 100,000 tons.

The Government responded to the rise in rice prices in 2012 by inviting the private sector to apply for authorization to import rice duty free. More than 70 firms applied and nine were selected and authorized to import 30,000 tons of rice (MAFC 2013). However, actual imports far exceeded the authorized imports and led to sharp price decreases just prior to the domestic harvest. Domestic rice prices continued to rise until April when large imports arrived and then declined by 35 percent over the following four months. Some of the imported rice was sold to neighbouring countries which led to trade disputes and countervailing import tariffs. If the private sector had been allowed to import at the prevailing tariffs, actual imports would have been smaller and more timely and prices would not have increased as much or fallen as far. It would not have been necessary to reduce the tariff, and the disruption to the market would have been less since the private sector would have been aware of the market conditions in both

the domestic and international market. The experience of rice imports in 2013 illustrates the difficulty of implementing an ad hoc policy decision and the importance of careful analysis to understand market demand. A more transparent rules-based policy would have been more effective in moderating the rise in domestic prices and caused less disruptions to the market. And, a better understanding of domestic market requirements and global and domestic food prices would also have shown that it was not necessary to allow duty-free imports.

Figure 2. Pakistan Rice Exports (thousand tons) vs. Import Price Margin (USD/ton).



Source: SERA based on Ministry of Industry and Trade and FAO data.

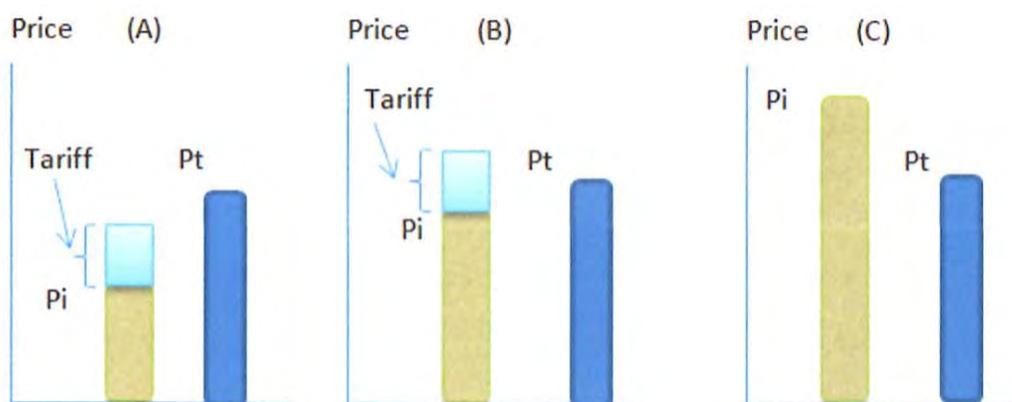
Market Situations

There are three market situations that can exist between Tanzanian and world market prices. The duty-paid import price could be below the domestic Tanzanian price and imports would be profitable; the duty-paid import price could be above the domestic price and imports would only be profitable at a reduced tariff; or the import price could be above the domestic price even with a zero tariff and imports would be unprofitable even without tariff. These three situations are shown in Figure 3. The import price includes all transport costs and adjustments for quality differences and is shown as P_i in Figure 3. The import tariff is then added to P_i to obtain the total import price of $P_i + \text{Tariff}$. The domestic Tanzanian price is denoted as P_t in Figure 3. As noted, $P_i + \text{Tariff}$ can be: 1) low enough that imports are profitable after paying the tariff (Figure 3 A), 2) high enough that imports are not profitable at P_t unless the tariff is reduced (Figure 3 B), or 3) above P_t even when the import tariff is zero (Figure 3 C). In the first case, imports are profitable when the import tariff is paid and imports will enter the domestic market if allowed and drive down the domestic price to the level where the import price is equal to the domestic price including the tariff. In the second case, imports will not be profitable unless the import tariff is reduced. In the third case, imports from the world market will not be profitable because the world market price exceeds the domestic price

even with a zero import tariff (this situation existed in 2008 when world market rice prices rose sharply during the global food crisis).

The normal market situation for most staple foods is depicted by Figure 3A and 3B. Both the import price and the domestic price fluctuate in response to changing demand and supply conditions and imports may be profitable in one period and not in the next. When importers are able to evade the tariff, imports will be profitable most of the time and that is why there is rice from many other countries in the domestic market even when reported imports are zero. The situation depicted in Figure 3C is very unusual and prior to 2008 had not occurred since the 1970s.

Figure 3. Relationship between import and domestic prices.



Source: SERA.

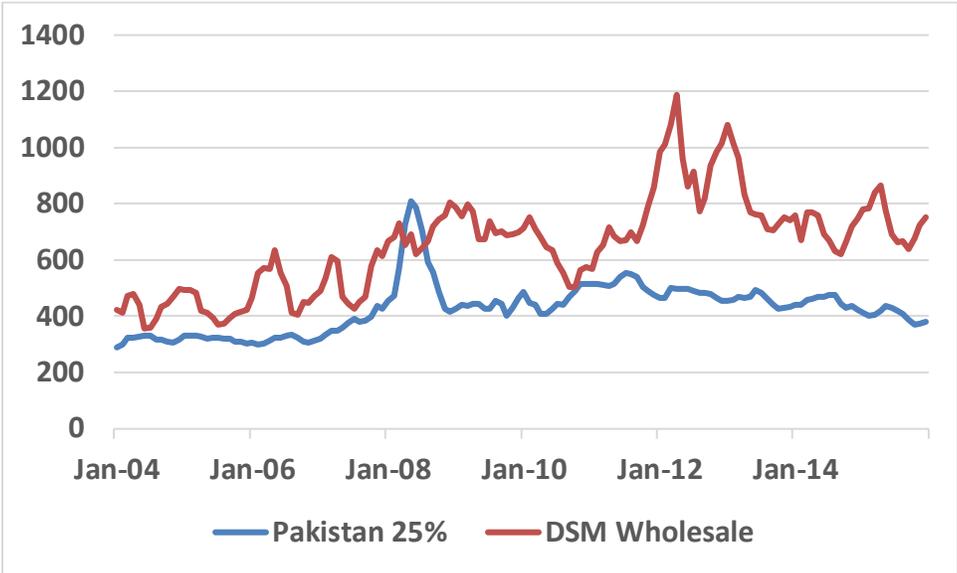
Emergency food imports are not needed in case 1) (Figure 3A) when the world market price plus tariff is below P_t , because imports will be profitable by the private sector and, if permitted, they will lower domestic prices and eliminate the need for emergency food imports. At the other extreme, case 3) (Figure 3C), imports will not be profitable even when the import tariff is zero and extreme measures will be required to protect consumers from high prices. This occurred in some countries in 2008 but not in Tanzania because domestic prices did not rise significantly. The situation where emergency food imports should be considered is case 2) (Figure 3B). In that case, imports will not be profitable for the private sector unless the tariff is reduced and the challenge for government is how to reduce the tariff to make imports profitable without unduly disrupting the domestic market or causing a trade dispute with neighbouring countries.

There are two policy instruments that can be used to allow emergency imports in case 2. The import tariff can be reduced and import quantities can be limited through quantitative restrictions, such as import permits. If the reduction in the tariff is just sufficient to allow imports, but not so large as to encourage excessive imports, then the quantitative restrictions may not be needed because imports will cause the domestic price to fall until imports are no longer profitable. However, if the reduction in the import tariff is larger than required to allow sufficient imports to cap the price increases then the quantitative restrictions will be needed to limit imports and prevent disrupting local markets. These two policy instruments can be combined to allow emergency imports without unduly disrupting domestic markets. Regardless of which policy instruments are used, it is important to obtain approval for the use of these

instruments from the East Africa Community to avoid trade disputes as occurred when rice was imported duty-free in 2013 and then exported to neighbouring countries. Such approval should be agreed before the emergency food imports are needed in order to avoid delays in implementing the rules-based system for imports. Figure 4 shows the Pakistan rice prices landed in Dar es Salaam without duty. Imports would be profitable in all periods except during the global food crisis in 2008.

The reduction in the import tariff that is sufficient to encourage imports without unduly disrupting the domestic market or causing trade disputes should be based on the differential between the domestic price and the import price. It should be large enough to encourage imports but not so large and to disrupt the domestic market. As shown in Figure 2, rice imports from Pakistan surged when the price differential exceeded USD 100 per ton and that should be sufficient to encourage imports. The tariff reduction should be for a specified period such as three months and renewed if necessary.

Figure 4. DSM and Pakistan Rice Prices (Ex Tariff).



Source: SERA based on Ministry of Industry and Trade and FAO data.

The third case as shown as Figure 3 (C) is when the import price P_i is above the Tanzanian domestic price P_t with a zero import tariff as occurred in 2008. In such a situation, imports are not profitable for the private sector. This is unusual and occurred during the global food crisis in 2008-2009. In such cases, Tanzania should rely on its own food reserves, and appeal to the international community for assistance. Such assistance will quickly become available as was the case during the global food crisis of 2008-2009, when the World Bank launched the Global Food Crisis Response which mixed fast-track funding with trust fund grants totalling US\$1.6 billion to 49 countries mostly in Africa (World Bank 2013). There are also other measures that can be taken to reduce the burden of higher prices on consumers, including increased food assistance to the lower income segments of society and reducing tariffs on other food crops such as wheat.

A Government Regulated Staple Foods Import Policy

A market-driven staple foods import policy is preferred for many reasons, but it requires that the Government be able to control illegal imports especially through major sea ports. If that is not possible, then an alternative approach is for the Government to use quantitative controls to limit imports instead of tariffs. Under this approach, the Government would authorize imports only when needed to meet domestic demand and prevent large price increases. Better monitoring of domestic demand, supply, and prices would be required; and the decision to authorize imports would need to be made in a timely manner to ensure imports arrive when needed without depressing prices in the following season. It would still be important to prevent illegal imports, but authorizing imports only during certain periods or circumstances would make that easier. The Government would need to decide 1) when to authorize imports, 2) the quantity of imports to authorize, and 3) the tariff and other conditions that applied. Improved monitoring of domestic, regional, and global markets would be important. The mechanism (trigger) that would be used to authorize imports should be based on both domestic prices and an assessment of the demand-supply situation. The quantities of imports to authorize should be based on an assessment of the market shortfall, and the import tariff that would apply should be based on the prices in the global or regional markets and quantities required to meet domestic demand.

The mechanism (trigger) that would indicate that imports are needed should include an analysis of prices since they reflect market conditions and are available on a timely basis. If prices are rising following harvest, that is an indication that production was not adequate to meet market demand for the following year and that imports may be required. It is not sufficient to rely exclusively on a price mechanism without further analysis, but is a signal that a potential shortage may develop and it should be followed with a review of the market situation.

Complying with East African Community Regulations

The Common External Tariffs (CET) of the East African Community (EAC) are published in the Import Duty Rates of the EAC CET and are adopted by the Council of Ministers. However, under the Duty Remissions Scheme, a member state can apply for a stay of the prevailing CET. If granted by the Council of Ministers, the member state is given a waiver that allows it to apply a rate that is different from the CET. A waiver is normally granted for a fixed period of time such as one year. The official notification of a waiver is published in June. Once a waiver is granted, a request can be made to extend it and that is normally approved on an annual basis. Goods imported at the lower import duty under the waiver and then re-exported to other EAC members are subject to the import tariff rate applicable in the importing country. This may be the CET rate, or if the importing country has its own waiver, the prevailing rate of the country. The process through which waivers or an extension of a waiver are requested is through the pre-budget consultation meeting of the Ministers of Finance.

Food security related waivers are handled differently from waivers on other goods. When there is a food security concern, the Coordinating Ministers of a member country writes to the secretariat and requests an extraordinary meeting of the Council of Ministers to be convened. The written request specifies the product and the proposed change to the CET or waiver. This request is copied to the Coordinating Ministers in the other member countries so that they are aware of the issues. The secretariat then arranges for an

extraordinary meeting, which can take from one to three weeks. The Council of Ministers almost always approves the request for an waiver if food security concerns are the justification. Countries applying for a waiver will specify a time period and specific rate (usually zero) and a specified quantity. If products imported under the food security concern are re-exported, the importing country will apply whatever rate it applies to imports from outside the EAC. When a country imports food under the food security concerns, there is some question about when it is free to export to the rest of the Community without paying the tariff that would apply to re-exports. The secretariat is working to improve the audit schemes in order to address this problem.

Conclusions

A transparent rules-based system for staple food imports would have several advantages for Tanzania. It would reduce the need for ad hoc policy decisions on staple food imports that are subject to influence from powerful business and political interests. It would reduce uncertainty and price risk about the magnitude and timing of food imports and thereby encourage investments in staple food crops production, trading, and storage. It would provide more stable food prices and more reliable food supplies for consumers, and it would increase tariff revenue collections for Government. It would also reduce the risk of trade disputes with neighbouring countries resulting from staple food imports, and it would provide a more stable business environment for the commodity exchange that is currently being developed.

There are several ways that such a system could operate. However, it is essential that large-scale illegal imports be controlled or it will not be possible to operate any transparent rules-based system effectively. According to international data sources, imports of some staple foods, such as rice and sugar, were two to three times larger than reported by Tanzanian customs during 2011-2015. Those imports represent the large-scale imports that come through major sea ports, but there are many other sources of illegal imports that are not recorded such as imports across porous land borders with neighbouring countries, imports through established border posts that are unrecorded, imports brought on small dhows from countries with lower tariffs, and transit goods that remain in country. It will not be possible to eliminate illegal imports, but greater efforts are required in order for a transparent rules-based system to operate. The focus should be on the large-scale imports that enter through sea ports while monitoring cross border and small dhow traffic will be much more difficult.

If large-scale illegal imports can be controlled and the designated tariffs collected on legal imports, then imports could be at the discretion of the private sector under normal market conditions. When the margin between domestic prices and landed imports from the world market are favourable, the private sector will have an incentive to import to supply the domestic market and that will moderate domestic price increases. Decisions on the timing and magnitude of imports will be made by the private sector and the Government's role would be to monitor markets and the operation of the private sector. An alternative approach would be for the Government to take responsibility for determining the magnitude of imports and issuing import permits for the required quantities. This would require the Government to monitor domestic food markets and develop better procedures for estimating food import requirements. It would also need to devote additional resources to monitoring regional and global markets in order to anticipate future market developments.

On occasion global food prices will be too high to allow the private sector to import food staples profitably. In those conditions, the Government should be prepared to reduce the import tariff in order to increase incentives for imports and ensure national food security. Such actions should be coordinated with the East Africa Community and prior approval negotiated on the grounds of food security. If the reduction in tariffs is not sufficient to make imports profitable for the private sector (which has only occurred once in the past 40 years) then domestic food reserves should be used, and the Government should approach the international community for assistance. Such assistance was provided during the global food crisis of 2008-2009 and would likely be available in the event of a similar global food crisis.

Next Steps

In order for the Government to adopt a rules-based system for staple foods imports, it must strengthen its ability to monitor and control illegal imports, and develop the capacity to monitor regional and global food markets. Controlling illegal imports should focus initially on large-scale imports through major sea ports and border posts. This must involve customs and get Government support for new procedures to control illegal imports. Once this is done, efforts should focus on reducing imports through informal panya routes and coastal trade using dhows from neighbouring countries and Zanzibar. A Market Intelligence Unit should be created and tasked with analysing domestic and regional staple food markets and prices in order to support a rules-based system. Then the specific approach and rules of operation must be developed and procedures agreed to with the East Africa Community.

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SERA Policy Brief

Food Demand in Tanzania¹

Food demand in Tanzania is very sensitive to prices, but much less sensitive to incomes. That is one of the important and surprising conclusions that comes from a comprehensive study of food demand based on more than 10,000 Tanzanian households. That suggests that most consumers, except those in the highest expenditure groups, are concerned with achieving an adequate diet rather than with achieving a diet that satisfies their taste preferences. The finding has important policy implications because it shows that reducing food prices would be an effective way to improve diets and reduce undernutrition.

The study estimated a large demand system for Tanzania for 18 food groups and four expenditure groups. The study found that the households within the lowest quartile (25%) of expenditures spent 72.6% of their expenditures on food and only those with the highest quartile (top 75%) spent less than half of their household expenditures on food. This conclusion is consistent with the low

¹ This Policy Brief was prepared by Don Mitchell and Edith Lazaro, Senior Advisor and Research Associate, respectively, of the SERA Policy Project. It is based on research conducted by Chen Zhen, Associate Professor of Agricultural Economics of the University of Georgia, Edith Lazaro, and Don Mitchell in their paper entitled: Cross-Sectional Estimation of Food and Nutrition Demand in Tanzania Using a Large Demand System. The paper is available by email from the authors at czhen@uga.edu, edithlzl@yahoo.co.uk or don.mitchell09@gmail.com. The SERA Policy Project is a USAID-funded Feed the Future Project that seeks to improve agricultural policies in Tanzania and build capacity for policy analysis and advocacy. It is implemented by Booz Allen Hamilton.

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calorie consumption of all expenditure groups, but especially for the lowest two expenditures quartiles who had average daily per capita consumption of 1,299 and 1,795 calories, respectively, which is well below the FAO recommended daily calorie allowance for a healthy active life of approximately 2,100 calories (Table 1).

Table 1. Per Capita Expenditures and Calorie Consumption.

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Per Capita Daily Expenditures				
<i>Mean TZS</i>	740	1,256	1,989	5,373
<i>Median TZS</i>	759	1,250	1,940	4,125
<i>Mean USD</i>	0.46	0.78	1.24	3.36
<i>Median USD</i>	0.47	0.78	1.21	2.58
Calorie Consumption	1,299	1,795	2,141	1,955
Food Share of Expenditures (%)	72.6	66.7	57.4	32.5

Source: Author's estimates.

Price Elasticities of Demand

The price elasticities of demand² for the four expenditure groups and the aggregate of all expenditure groups for 18 food groups and All Other Goods are shown in Table 2. Almost all elasticities are statistically significant³ at the one percent level and almost all are elastic which indicates that households respond to price changes with a more than proportionate change in quantity demanded. For example, the price elasticity for rice for the lowest expenditure group is -1.88 which means that a 1.0 percent increase (or decrease) in rice prices would result in a 1.88 percent decrease (or increase) in quantity demanded. Further, nearly all price elasticities are higher for lower expenditure groups than for higher expenditure groups. This shows that households in lower expenditure groups are more response to price than those in higher expenditure groups because their lower expenditure levels make it more difficult to maintain the same demand when the prices rise. It also shows that they have a larger percentage demand increase when the price declines. Price elasticities are also consistent among food groups with basic staple food groups, such as maize and cassava, having lower price elasticities than more preferred food groups such as poultry or dairy. The food groups with the lowest aggregate price elasticities are: red meats (-.53), maize (-.81), and fats and oils (-.99) indicating that households reduce demand for these food items less than for other food groups if prices rise or increase their demand less if prices fall. These

² The price elasticity of demand is defined as the percentage change in quantity divided by the percentage change in price. Since price and quantity move in opposite directions (price increases cause demand decreases) it is a negative number (with rare exceptions).

³ Statistical significant is a test of whether the estimated parameter is significantly different from zero. Estimates are normally reported as statistically significant at the 1, 5, and 10% level with 1% being the most significant.

food groups are basic staple foods for households. The food groups with the highest aggregate price elasticities are: other meats (-3.34), dairy (-2.34), soft drinks & juices (-2.16) and fruits (-2.07). Households will increase the demand for these food groups more than proportionately to a change in prices. For example, if the price of soft drinks & juices increased by 1%, per capita household consumption would fall by 2.16%, and if the price fell by 1% per capita household consumption would rise by 2.16%. However, the response would be greater for lower expenditure groups with households in the lowest expenditure group increasing expenditures by 2.46% compared to 1.79% for households in the highest expenditure group.

Table 2. Price Elasticities of Demand.

	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Aggregate
Food Categories					
<i>Rice</i>	-1.88***	-1.70***	-1.57***	-1.50**	-1.72***
<i>Maize</i>	-0.90***	-0.81***	-0.88***	-0.43	-.81***
<i>Cassava</i>	-1.34***	-1.19***	-1.06**	-0.92	-1.19**
<i>Wheat & Other Cereals</i>	-1.86***	-1.73***	-1.61***	-1.56***	-1.74***
<i>Red Meats</i>	-0.76***	-0.52***	-0.39**	-0.14***	-.53***
<i>Poultry</i>	-2.02***	-1.87***	-1.77***	-1.71***	-1.88***
<i>Fish & Seafood</i>	-1.26***	-1.48***	-1.70***	-2.09***	-1.48***
<i>Other Meats</i>	-4.03***	-3.30***	-2.83***	-2.48***	-3.34***
<i>Dairy</i>	-2.44***	-2.32***	-2.27***	-2.22***	-2.34***
<i>Fats & Oils</i>	-1.03***	-0.98***	-0.94***	-0.88***	-.99***
<i>Fruits</i>	-2.27***	-2.05***	-1.90***	-1.85***	-2.07***
<i>Vegetable</i>	-1.42***	-1.21***	-1.01***	-0.69***	-1.23***
<i>Pulses</i>	-1.46***	-1.24***	-1.05***	-0.74***	-1.27***
<i>Roots & Tubers</i>	-1.90***	-1.71***	-1.61***	-1.60***	-1.74***
<i>Sugar</i>	-1.30***	-1.21***	-1.15***	-1.09***	-1.22***
<i>Eggs</i>	-1.31***	-1.22***	-1.16***	-1.11***	-1.22***
<i>Coffee, Tea & Cocoa</i>	-2.23***	-1.92***	-1.72***	-1.51***	-1.94***
<i>Soft Drinks & Juices</i>	-2.46***	-2.16***	-1.98***	-1.79***	-2.16***
<i>All Other Goods</i>	-1.22**	-1.23***	-1.24***	-1.25***	-1.23***

Note: Parameters are estimated for four income groups (quartiles), with the lowest group comprised on those households in the lowest quartile (25%) of all households, the second quartile comprised of those households in the second lowest 25% of per capita expenditures, etc. The statistical significance of the parameter estimates are denoted by *s, with those significantly different from zero at the 10% level denoted by *, those significantly different from zero at the 5% level denoted by **, and those significantly different from zero at the 1% level denoted by ***.

Starchy food such as pulses, roots & tubers, and cassava generally have lower price elasticities than animal products such as meats, dairy, and poultry products with the exception of red meats which has the lowest aggregate price elasticity of all food groups. Red meats include: beef, goat, sheep and offal, and it seems surprising that the price elasticity is the lowest of all food groups. The price elasticity of demand for fish & seafood is also unusual because the price elasticity increases for households in higher expenditure groups. This result may be due to the wide variation in the quality and price of fish & seafoods available. Households in higher expenditures groups may be more response to price changes of the most costly types of fish & seafoods while households in lower expenditure groups may consume a more affordable variety and be less responsive to price changes.

Expenditure Elasticities of Demand

Expenditure elasticities measure the responsiveness of quantity demanded to changes in the level of expenditures – which is a proxy for income levels. Demand studies typically use expenditure levels instead of income because income levels are not usually available while expenditure levels are available from household surveys. An expenditure elasticity is defined as the percent change in quantity demanded divided by the percentage change in expenditure level. The expenditure elasticities for the 18 food groups plus All Other Goods for four expenditure groups and the aggregate for all expenditure groups are shown in Table 3. The results show that households in all income groups are less responsive to changes in their expenditure levels than to changes in prices. As with the estimates of price elasticities presented in Table 2, the statistical significance of the estimates is denoted by the number of *. The results show that the quantity demand of many food groups does not increase as the level of expenditure increases. Rice demand, for example, was estimated to be very response to changes in prices (Table 2) but not to changes in expenditures.

Maize and cassava demand were estimated to be responsive to both price and expenditure level for the lowest expenditure groups but not for the highest expenditure groups. In general, the demand for cereals (maize, rice, wheat, and other cereals) was more responsive to changes in price than expenditure levels. The demand for animal products (meats, dairy, and eggs) was more responsive to price than expenditure levels with the exception of poultry which was responsive to both price and expenditure levels for all expenditure groups. The demand for fruits and, to a lesser extent vegetables, were responsive to both price and expenditure levels and lower expenditures groups had higher price and expenditures elasticities than higher expenditure groups. The demand for vegetables was responsive to the level of expenditures for the lowest two expenditure groups but not for the two highest expenditure groups. Pulses and tubers were not found to be responsive to expenditure levels for any of the expenditure groups, but they were found to be responsive to prices for all expenditure groups. Sugar and beverages (coffee, tea, and cocoa) were responsive to both expenditure levels and price for all four expenditure groups.

Table 3. Expenditure Elasticities.

	<i>Quartile 1</i>	<i>Quartile 2</i>	<i>Quantile 3</i>	<i>Quartile 4</i>	<i>Aggregate</i>
Food Categories					
<i>Rice</i>	0.33	0.37	0.46	0.50	.39
<i>Maize</i>	0.50***	0.37**	0.17	-0.42	.42*
<i>Cassava</i>	2.51*	2.02**	1.75*	1.54	1.61*
<i>Wheat & Other Cereals</i>	0.56	0.66	0.83	1.05	.58
<i>Red Meats</i>	0.11	0.32	0.55	0.70**	.34
<i>Poultry</i>	2.57***	2.47***	2.38***	2.17***	2.26***
<i>Fish & Seafood</i>	1.12***	1.05***	1.06***	1.06***	1.05***
<i>Other Meats</i>	-1.31	-0.76	-0.47	-0.19	-1.66
<i>Dairy</i>	1.34**	1.37***	1.32**	1.24**	1.37**
<i>Fats & Oils</i>	0.10*	0.13	0.21	0.22	.19
<i>Fruits</i>	1.61***	1.35***	1.20***	1.01***	1.29***
<i>Vegetable</i>	0.60***	0.47**	0.31	-0.18	.57*
<i>Pulses</i>	-0.10	-0.17	-0.20	-0.36	-.04
<i>Roots & Tubers</i>	-0.01	0.13	0.26	0.41	-.04
<i>Sugar</i>	2.65**	2.14**	1.79**	1.38*	1.65**
<i>Eggs</i>	0.50	0.82	1.14	1.51**	.87
<i>Coffee, Tea & Cocoa</i>	3.30**	2.57***	1.93**	1.36**	1.84**
<i>Soft Drinks & Juices</i>	-0.59	-0.13	0.15	0.37	-.13
<i>All Other Goods</i>	1.59***	1.49***	1.38**	1.26***	1.4***

Note: Parameters are estimated for four income groups (quartiles), with the lowest group comprised of those households in the lowest quartile (25%) of all households, the second quartile comprised of those households in the second lowest 25% of per capita expenditures, etc. The statistical significance of the parameter estimates are denoted by *s, with those significantly different from zero at the 10% level denoted by *, those significantly different from zero at the 5% level denoted by **, and those significantly different from zero at the 1% level denoted by ***.

The Model

The demand study estimated a two-way Exact Affine Stone Index demand system for 18 food groups and a numéraire good using the 2011/12 Tanzania household budget survey of close to 10,000 households. To our knowledge the study is the largest food and nutritional demand system ever estimated for Tanzania at different income levels. It extends the literature in that it is the first demand study where econometric complications of censored demand, price and expenditure endogeneity, and curse of dimensionality associated with large demand systems are addressed in unified framework in a developing country context. Also the utility-theoretic demand model estimated allows even the Hicksian price elasticities to be different between households at different

total expenditure levels. This extra flexibility in functional form can be especially useful for developing countries because, with foods being necessities, demand patterns may be quite distinct between households of different income levels. The model and data are described in the Box.

Policy Implications

The findings have important policy implications. First, they show the importance of reducing food prices in order to increase consumption and reduce undernutrition. Second, a few food groups were found to have high responsiveness to changes in expenditure levels, and these food groups (poultry, sugar, and beverages) are expected to have more than proportionate increases in per capita consumption as expenditure levels rise in the future. Third, those food groups with the lowest responsiveness to expenditure levels (maize, red meats, fats & oils) are expected to have the slowest growth in per capita consumption as expenditure levels rise in the future. The policy implication of these findings are that the food system will need to respond differently to meet the market demand for those food groups expected to have more rapid increases in future demand and those with slower increases in expected demand. Appropriate policy responses could include efforts to increase production and lower production costs in order to reduce food prices and reduce food insecurity and longer-term investments that would stimulate production increases in those food groups with high responsiveness to expenditure level increases. This could be done by reducing production costs through productivity enhancing investments, such as research, or by policies that allow imports of lower cost food from neighboring countries and global markets.

Box: Econometric Model

The two-way approximate EASI demand system is specified as

$$(1) \quad w_{hi}^* = \sum_{j=1}^J a_{ij} \ln p_{hj} + \sum_{j=1}^J a_{ijy} y_h \ln p_{hj} + \sum_{r=1}^L b_{ir} y_h^r + \sum_{k=1}^K v_{ik} z_{hk} + u_{hi}, \quad h = 1, \dots, H; \quad i = 1, \dots, J - 1;$$

where w_{hi}^* is the latent budget share on the i th category for household h , p_{hj} is the price index for household h and category j , J is the number of demand categories and equals 19 (18 FAH categories plus a *numéraire*), y_h is the real total household expenditure, L is the highest degree of total expenditure polynomial to be determined by statistical tests, the z_{hk} 's are K exogenous demand shifters including a constant, the a_{ij} , a_{ijy} , b_{ir} , and v_{ik} terms are parameters, and u_{hi} is the regression residual. Following Lewbel and Pendakur (2009), we construct y_h as the Stone price-deflated total household expenditure:

$\ln x_h - \sum_{j=1}^J w_{hj} \ln p_{hj}$, where x_h is nominal total household expenditures on food and other goods and services. Because of censoring, the latent share w_{hi}^* is related to observed budget share w_{hi} according to $w_{hi} \equiv \max\{0, w_{hi}^*\}$ $w_{hit} \equiv \max\{0, w_{hit}^*\}$, where w_{hit} is calculated as category-level expenditure divided by total expenditures.

The EASI demand system is estimated as a system of $J - 1$ Tobit equations (1) using the extended AGLS by Zhen et al 2013 while controlling for price and expenditure endogeneity. The extended AGLS estimator builds on the standard AGLS estimator for single-equation limited dependent variable models and extends it to the context of a system of limited dependent variable equations. The estimator works in three steps. In the first step, reduced-form Tobit regressions are estimated equation-by-equation, where censored budget shares are the dependent variables. The explanatory variables are the exogenous demand shifters, instrumental variables, and residuals from least squares auxiliary regressions of endogenous total expenditures and prices on all exogenous variables and instruments. The second step recovers the structural parameters of the budget share equations (1) using minimum distance (Wooldridge 2002, p. 444) and constructs the correct asymptotic covariance matrix for the structural parameters, which accounts for the correlation between the Tobit equations and between the Tobit equations and the linear auxiliary regressions. In the third step, the minimum distance estimator is applied again to impose the utility-theoretic restrictions of homogeneity ($\sum_j a_{ij} = 0$ and $\sum_j a_{ijy} = 0 \quad \forall i$) and symmetry ($a_{ij} = a_{ji}$

and $a_{ijy} = a_{jiy}$) on the latent demand. The three-step extended AGLS estimator is efficient among a class of limited information estimators (Newey 1987). In comparison with full information maximum likelihood estimators that estimate all Tobit equations simultaneously (e.g., Dong, Gould, and Kaiser 2004), the extended AGLS is more feasible for estimating large demand systems, especially when some explanatory variables may be endogenous.

Data for the 18 food groups in the study were aggregated from total of 184 food items. The top three staple foods categories: rice, maize, and cassava mainly include reported consumption of grains or processed grains mostly in flour. Wheat and other cereals category include: consumption of wheat, and other grains like millet, sorghum, and barley, The red meat category is composed of fresh and processed beef, goat, and sheep meat, The poultry category is comprised of fresh and processed chicken products; the fish and seafood category includes consumption of all types of fresh fish, processed fish products, and other seafood; the other meat category consist of fresh pork, processed pork, and other wild animals; dairy includes dairy and dairy products; fats and oils includes all edible vegetable oils, seed oils, and butter; fruits includes all fresh and processed fruits; pulses includes beans, lentils, and all other pulses and their products; roots and tuber includes sweet and Irish potatoes, yams, and coco yams; sugar includes raw sugar, jam, chocolate and all other confectionery products; and all other goods includes is comprised of all other goods and services.

Note: Complete references and econometric techniques used to handle potential model and data complications are included in the complete report available from the authors.

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SERA Policy Research Brief

Cross-Border Transmission of Food Price Shocks¹

Food price volatility has a profound impact on the lives of the poor in developing countries, but much remains to be learned about the sources of food price volatility. Food prices may be influenced by internal factors such as supply shocks or external factors such as demand shocks emanating from neighboring countries or world markets. The influence of external factors is commonly assumed to be transmitted from one external, typically international, market to the largest domestic city or port. This Policy Research Brief reports the results of research that aims to better understand the cross-border transmission of demand shocks using a network approach that identifies the sources of price volatility for 18 regional maize and rice markets in Tanzania.

The findings have important trade policy implications. If shocks to domestic food markets are transmitted through Dar es Salaam, then border controls will be more effective at controlling food price volatility than if shocks are transmitted from regional sources through more informal trade channels such as across land borders and lakes. Further, understanding the channels through which regional food market disturbances are transmitted to local Tanzanian markets will serve to improve forecasts of domestic food price volatility. The research concluded that Dar es Salaam is not a demand or supply focal point and that most external demand shocks to the domestic maize and rice market do not emanate from or go through Dar es Salaam. This suggests that border controls that are primarily directed at imports

¹ This Policy Research Brief is based on a working paper entitled “The Cross-Border Transmission of Price Shocks: Evidence from Tanzanian Food Markets” co-authored by John Baffes, Varun Kshirsagar and Donald Mitchell. The research was supported by the Tanzania SERA Policy Project. The authors are respectively, Senior Economist at the World Bank, independent consultant, and Senior Advisor of the Tanzania SERA Policy Project. The working paper is available from authors by email at: jbaffes@worldbank.org, varun.kshirsagar@gmail.com and don.mitchell09@gmail.com. The Tanzania SERA Policy Project is a USAID-funded Feed the Future Project that seeks to improve agricultural policies in Tanzania and build capacity for policy analysis and advocacy. It is implemented by Booz Allen Hamilton.

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coming through the port in Dar es Salaam will not be very effective at controlling food price volatility.

Dar es Salaam does not connect the main surplus producing areas (i.e. the southern zone for maize and rice, and the lake zone for rice) with the main regional demand centers of Nairobi (Kenya) in the north and Nampula (and the rest of Mozambique) in the south and much of this trade is through informal channels. That limits the effectiveness of protectionist trade policies since informal trade is more difficult to control than trade through major ports such as Dar es Salaam. In particular, Songea (for maize) and Shinyanga (for rice) are focal points for local price formation, and these markets are influenced by other markets in the region. For maize markets, Nairobi has the largest influence on Tanzanian markets during the harvest season, while Nampula has the largest influence during the lean season. For rice, Bukoba (an important Lake Victoria port) has the largest influence during the harvest season, while international markets (Vietnam and Pakistan) have the largest influence during the lean season.

These findings suggest a more effective policy than trying to control cross-border food movements would be to remove impediments to food flows within the country. While Dar es Salaam is the largest city and economic capital of the country, the demand from Kenya and Mozambique are more significant determinants of prices and policy makers need to be aware of the policies of neighboring countries when formulating a national food trade policy. The main policy message from this Policy Research Brief is that border controls for maize and rice are not likely to be an effective way to provide improved price incentives to producers because demand shocks are primarily transmitted through informal channels from neighboring countries. Other measures such as reducing inefficiencies that stem from inadequate rural infrastructure are likely to be more effective at increasing agricultural productivity.

The Estimation Framework

The empirical framework for the research (which is described in the full paper) builds on the framework employed in Baffes et al. (2015) and consists of a bilateral vector error correction model (Engle and Granger (1987)) with additional controls for seasonality, weather anomalies and export bans (maize). Let p_t^A and p_t^B be the real log prices, at time t , for the relevant commodity (maize or rice) for a pair of markets A and B that experience local weather anomalies $NDVI_t^A$ and $NDVI_t^B$ then equations 1-3 comprise the main specification:

$$\Delta p_t^A = \mu^A + \gamma_1^A (p_{t-1}^B - p_{t-1}^A) + \gamma_2^A \Delta p_{t-1}^B + \gamma_3^A \Delta p_{t-1}^A + F_t[\cdot] + u_t^A \quad (1)$$

$$\Delta p_t^B = \mu^B + \gamma_1^B (p_{t-1}^B - p_{t-1}^A) + \gamma_2^B \Delta p_{t-1}^B + \gamma_3^B \Delta p_{t-1}^A + F_t[\cdot] + u_t^B \quad (2)$$

$$F_t[\cdot] = \gamma_4^{S1} \sin\left(\frac{2\pi t}{12}\right) + \gamma_4^{C1} \cos\left(\frac{2\pi t}{12}\right) + \gamma_4^{S2} \sin\left(\frac{4\pi t}{12}\right) + \gamma_4^{C2} \cos\left(\frac{4\pi t}{12}\right) + \gamma_5^A NDVI_t^A + \gamma_5^B NDVI_t^B + \gamma_6 I_{BAN_t} \quad (3)$$

This empirical framework has two main advantages. First, it is the simplest approach to estimate whether a market is endogenous or exogenous in a given relationship. Second, in contrast to a framework with several (potential) co-integrating vectors, the framework provides flexibility in terms of specification choices to incorporate additional variables, and may therefore control for harvest cycles and other local factors. Together, this allows for better interpretations of the economics underlying the parameter estimates.

More specifically, if a market adjusts to the lagged spread between the co-integrated series, it is considered to be the endogenous (i.e. a follower) market with regard to that pair. If it doesn't adjust, it is considered exogenous (i.e. the lead market). Our core insight, with regard to market network analysis, is to use these estimated values to calculate recursive measures of a market's importance to the domestic food market system. For example, Arusha and Moshi are important exogenous rice and maize markets not just because prices in many other markets adjust to their lagged price differential, but because the markets that do adjust are, in turn, exogenous (i.e. lead markets) in relationships with other markets, and so on. Consequently, shocks to Arusha and Moshi (markets closest to Kenya) exert a strong influence across both maize and rice systems. Therefore, they capture the main channel through which external demand shocks influence the Tanzanian maize and rice market systems.

Rice and Maize Markets in Tanzania

Tanzania's geography is important in understanding its food staples markets. First, the largest city (Dar es Salaam) does not connect the major rice or maize producing zones with major regional demand centers to the north (Kenya) or to the south (Mozambique). Consequently, it does not serve as a major hub with regard to the road transport of food staples across countries in the region. Surplus food from the south would plausibly flow through Iringa and Dodoma into Kenya and Uganda. Second, while road transport links to Kenya (between Arusha/Moshi and Nairobi) as well as water transport routes across Lake Victoria are relatively well developed, the transport linkages to Tanzania's south are less well developed. Third, the number of possible paths for food trade is large, and it would be difficult to monitor and control food flows across all of Tanzania's land and water borders.

Rice and maize markets have significant structural differences in production, consumption and trade (Table 1). While consumption and production of both have increased rapidly, Tanzania produces a small surplus of maize in most years but is often deficit in rice. Almost all Tanzania's neighboring countries are heavily dependent on rice imports (typically from more efficient producers in Asia), and cannot regularly rely on imports from Tanzania. In contrast, most countries (with the important exception of Kenya) are close to being self-sufficient in maize. Table 1 has three implications for Tanzanian maize markets and trade. First, Kenya is the major deficit country in the region. Kenya imports about a sixth of its consumption, which is the largest in East Africa (3.6 million metric tons). Second, Kenya's maize import needs are growing rapidly. In contrast, Mozambique has reduced its need for imported maize. Third, all of Tanzania's neighbors produce significant quantities of maize. This provides the potential for trade as an instrument to diversify shocks to maize production that are not correlated across countries. In contrast, the potential for trading

rice with Tanzania’s neighbors is more difficult. Together, this suggests the need to develop a commodity-specific food trade policy that is cognizant of market demand and supply for all the bordering countries — both during favorable and less favorable years.

Table 1: Maize and Rice Balances in Eastern and Southern Africa (000 tons).

	<i>Consumption</i>			<i>Production</i>			<i>Net Imports</i>		
	<i>2002-08</i>	<i>2009-15</i>	<i>% Ch</i>	<i>2002-08</i>	<i>2009-15</i>	<i>% Ch</i>	<i>2002-08</i>	<i>2009-15</i>	<i>% Ch</i>
Maize Market									
<i>Kenya</i>	2,921	3,621	24.0	2,742	2,989	9.0	0.08	0.17	8.8
<i>Mozambique</i>	1,457	1,686	15.7	1,282	1,589	24.0	0.13	0.06	-7.0
<i>Rwanda</i>	107	564	426.0	107	502	367.6	0.02	0.13	10.5
<i>Tanzania</i>	3,100	4,771	53.9	3,119	5,085	63.1	0.01	-0.04	-5.4
<i>Uganda</i>	1,179	2,386	102.4	1,222	2,589	112.0	-0.03	-0.08	-4.4
<i>Zambia</i>	1,057	2,214	109.5	1,104	2,732	147.5	0.05	0.00	-5.3
Rice Markets									
<i>Kenya</i>	280	462	65.1	33	70	114.8	0.94	0.83	-10.0
<i>Mozambique</i>	464	614	32.4	126	176	40.2	0.73	0.71	-1.60
<i>Rwanda</i>	48	92	91.4	34	53	56.7	0.30	0.43	12.7
<i>Tanzania</i>	877	1,520	73.4	761	1,401	84.0	0.13	0.08	-5.3
<i>Uganda</i>	141	207	46.9	97	144	49.1	0.31	0.30	-4.4
<i>Zambia</i>	19	38	96.0	9	31	232.7	0.52	0.19	-5.3

Sources: Author’s estimates based on USDA PSD database.

Table 2 describes the salient characteristics of maize prices in Tanzanian and relevant external markets. The international benchmark prices (U.S. Gulf and Randfontein, South Africa) are considerably lower than the prices in markets in Eastern and Southern Africa. Maize price levels are the highest in the major deficit areas of Nairobi, Mombasa and Maputo and lowest in the surplus areas. For Tanzania, prices are lowest in the Southern Highlands. Songea, a remote surplus market in the Southern Highlands, has the lowest average price level of any market in Tanzania. Crucially, the markets with which Songea and the other southern markets may engage in cross-border trade (Kasama, Zambia; Mzuzu, Malawi; and Nampula, Mozambique), also have low price levels because they share the same characteristics as Songea. Of these, Nampula is the best connected and has the lowest surpluses, and it exerts an influence on the southern Tanzanian markets, and by extension to the entire Tanzanian maize market system. Finally, it is worth emphasizing that the markets with the lowest (average) price levels also exhibit the greatest declines during the harvest, as well as the largest volatility.

Table 3 describes the main characteristics of rice prices across the main regional markets in Tanzania. The main production areas (Shinyanga, Mwanza, Tabora, and Mbeya) have the lowest prices, and the highest price volatility. The seasonal declines are comparable to those in the surplus maize producing areas, and prices during the harvest period are comparable to international prices. In contrast, price levels across Tanzania in March (the

peak of the lean season) are considerably higher than international prices. Thus if the goal of a protectionist rice policy is to support the development of the rice industry, then the prices that matter are surely the ones in the main producer regions during the harvest. But what these results show is that prices are not higher than international prices during the harvest period in the main producing areas while prices are higher than international prices during the lean period prior to harvest. Thus the policy does not effectively support the development of the rice industry, but it does increase costs to consumers.

Table 2: Maize Price Levels and Volatility in Local, Cross-Border and International Markets

Market	Mean Real Price (2010 Tsh.) : 2004-2015			Volatility (%)
	Full Sample	March (Pre-Harvest)	July (Main Harvest)	Std. Dev. of Real Log Changes
Arusha	34,697	36,061	33,258	9.7
Bukoba	36,687	33,106	37,137	11.6
Dar	36,254	37,785	35,037	9.9
Dodoma	36,929	40,288	33,802	10.1
Iringa	28,326	32,493	26,440	13.4
Lindi	36,823	43,248	32,935	16.8
Mbeya	28,958	31,836	25,858	10.4
Morogoro	35,666	39,586	31,002	13.5
Moshi	36,168	36,644	37,305	10.7
Mtwara	36,128	41,673	31,739	17.6
Musoma	38,527	36,408	37,202	11.6
Mwanza	40,098	40,162	39,825	10.4
Shinyanga	36,275	38,705	34,181	10.4
Singida	34,536	37,272	31,802	12.3
Songea	24,746	29,296	21,299	17.7
Sumbawanga	24,947	24,515	22,281	14.1
Tabora	35,002	38,934	30,617	13.5
Tanga	34,386	36,711	30,788	14.1
Median	35,897	36,991	32,368	12
Neighboring Countries				
Kampala	31,404	30,287	34,488	15.7
Nairobi	41,220	39,117	43,387	9.4
Mombasa	40,962	38,821	45,086	9.3
Nampula	37,608	42,630	32,628	14.3
Maputo	50,154	51,610	47,483	9.8
Kasama	33,000	39,959	28,696	19.6
Lilongwe	36,229	31,630	34,832	17.2
Mzuzu	33,850	41,357	29,541	16.3
International Benchmarks				
Randfontein	28,844	29,123	28,729	9.1
US Gulf	25,977	26,244	26,647	6.8

Source: Authors' estimates based on data from the Government of Tanzania and FAO (GIEWS)

Table 3: Rice Price Levels and Volatility in Local, Cross-Border and International Markets

Market	Mean Real Rice Price (2010 TSh.) : 2004-2015			Volatility (%)
	Full Sample	March (Pre-Harvest)	July (Main Harvest)	Std. Dev. of Real Log Changes
Arusha	103,503	107,703	100,248	5.3
Bukoba	91,331	93,521	83,695	9.5
Dar	106,049	116,249	100,183	7.2
Dodoma	110,650	113,706	104,810	7.8
Iringa	101,271	109,421	94,589	8.5
Lindi	108,482	115,479	100,697	7.6
Mbeya	97,953	105,273	92,243	8.8
Morogoro	98,573	104,926	92,762	7.2
Moshi	106,289	106,252	104,027	8.6
Mtwara	103,874	112,126	94,697	7.3
Musoma	98,891	103,529	89,781	8.7
Mwanza	92,747	100,745	84,255	9.8
Shinyanga	89,256	95,865	78,702	10.0
Singida	102,145	110,812	91,273	8.1
Songea	96,108	100,108	90,088	7.8
Sumbawanga	90,961	98,998	81,404	10.3
Tabora	87,288	93,951	77,846	8.7
Tanga	101,227	107,688	95,586	5.4
Median	100,059	105,763	92,503	8
Neighboring Countries				
Kampala, Uganda	108,814	107,191	108,240	7.7
Kenya : Grade 1	210,299	203,942	212,735	8.8
Kenya : Grade 2	107,398	104,035	108,625	5.3
Nampula, Moz.	61,962	60,782	62,716	3.6
Maputo, Moz.	60,808	60,074	59,991	4.0
International Benchmarks (High Quality)				
Pakistan Basmati	79,809	80,546	82,573	7.4
Thailand (100%)	75,112	74,943	75,946	4.9

Source: Authors' estimates based on data from the Government of Tanzania and FAO (GIEWS)

Cross Border Linkages

Cross border external linkages are reported for maize in Table 4a and rice in Table 4b in terms of the number of Tanzanian markets that are affected by external markets and the speed of adjustment of prices to shocks to these markets (half-lives²). These cross border external linkages are different for the harvest and lean periods. For example, demand shocks to Nairobi are transmitted to 12 Tanzanian markets during the harvest season with a half-life of 2.1 months, but only 4 Tanzanian markets during the lean season with a half-life of 3 months. This is consistent with the trade balances reported in Table 1 and also with popular belief. However, the maize market in Nairobi is also influenced by

² The half-life refers to the number of months required for one-half of the price differential to be eliminated.

markets in Tanzania (albeit with a much larger half-life of 5 months). No external market exerts a large influence on any domestic rice market. In contrast, several external maize markets strongly influence domestic prices. Further, the half-lives are much larger with respect to the linkages with external rice markets.

Table 4a: External Maize Market Influences.

	Harvest Season				Lean Season			
	Influenced Tanzania		Influenced by Tanzania		Influenced Tanzania		Influenced by Tanzania	
	No.	HL	No.	HL	No.	HL	No.	HL
External Market								
Kampala, Uganda	0		3	2.9	7	3	0	
Nairobi, Kenya	12	2.1	9	5.0	4	3	0	
Mombasa, Kenya	7	2.0	0		6	2	0	
Nampula, Mozambique	9	2.2	7	3.8	15	1	1	3
Kasama, Zambia	0		0		5	2	6	2
Lilongwe, Malawi	3	2.8	0		11	2	0	
Mzuzu, Malawi	6	2.8	0		5	3	17	4
Randfontein, SA	6	4.6	0		2	4	0	
U.S. Gulf	5	3.6	0		1	4	0	

Source: Baffes, Kshirsagar, and Mitchell (2016).

Note: HL refers to Half Life which is the number of months required for one-half of the price differential to be eliminated.

Table 4b: External Rice Market Influences.

	Harvest Season				Lean Season			
	Influenced Tanzania		Influenced by Tanzania		Influenced Tanzania		Influenced by Tanzania	
	No.	HL	No.	HL	No.	HL	No.	HL
External Market								
Kampala, Uganda	1	2.7	6	3.8	1	4.5	11	5.6
Kenya, Grade 1	0		0		1	7.2	0	
Kenya, Grade 2	0		0		1	5.6	0	
Nampula, Mozambique	2	6.9	0		1	7.8	0	
Pakistan Basmati	1	7.8	0		1	7.1	0	
Pakistan 25% Broken	2	8.3	0		0		0	
Thailand 100%	1	4.3	0		0		0	
Thailand 5% Broken	2	8.2	0		0		0	
Thailand 25% Broken	2	7.7	0		0		0	
Vietnam 5% Broken	2	8.6	6	1.8	1	9.0	0	
Vietnam 25% Broken	2	8.7	3	13.1	2	9.1	0	

Source: Baffes, Kshirsagar, and Mitchell (2016).

Note: HL refers to Half Life which is the number of months required for one-half of the price differential to be eliminated.

Perhaps less well known is the important influence of Nampula, Mozambique. While Nampula also exerts an influence on local Tanzanian markets during the Tanzanian harvest, it is the primary external maize market during the lean season. Nampula influences 15 local Tanzanian maize markets (with a minimum half-life of just 1.8 months) during the lean season. Differences in harvest cycles may explain this pattern. First, the Tanzanian lean season in the main surplus areas (October through March) overlaps with the main Kenyan harvest season (which begins in September). Therefore, demand for maize from Kenya (and Northern Tanzania) will be small during these months. In contrast, the lean season in the Tanzanian Southern Highlands corresponds to the lean season in Mozambique and Zambia. Further, Tanzania typically has larger surpluses than these countries. Therefore, during the lean season Nampula serves as a conduit to link surplus from Southern Tanzania to countries in Southern Africa.

Tanzanian maize prices do not influence international markets (U.S. Gulf) for maize or the maize prices in South Africa. Although, a little less than half the Tanzanian markets are influenced by the U.S. Gulf and South Africa, the minimum half-lives are significantly larger than those associated with Nairobi and Nampula. It is especially worth noting that cross-border adjustments with Kenya and Mozambique are comparable with domestic adjustments, while trade frictions with the international markets are larger. This suggests that road (and perhaps Lake) transport works well, but trade flows through the sea ports have to overcome greater impediments.

In contrast to maize, external-domestic linkages for rice are particularly weak. While we do not have rice prices for Nairobi, Kenyan average prices are weakly linked with Tanzania. Asian markets influence very few domestic Tanzanian rice markets and with large half-lives typically between 6 and 8 months. There are three reasons for these weak linkages. First, rice markets are protected with large import tariffs. Second, none of Tanzania's neighbors produce a rice surplus, but most import rice with lower tariffs. Consequently, prices are lower in these countries and exports to Tanzania are discouraged. Therefore, regional trade flows with other countries in the region are typically informal and not significant enough to engender a fast adjustment. Third, when Tanzania does officially import rice from Asia, the time and trade costs are considerable (including contracts, ocean transport and bottlenecks at the ports).

Market Network Analysis

The previous analysis examined price relationships between market pairs. Yet, in the real world, markets operate as part of a system. Therefore, it is important to examine individual markets in the context of their systemic influence. To begin with, we define market linkages based on three criteria. First, a given market pair is required to be co-integrated-in the sense that the price level series have unit roots, but the spread is stationary. Second, the relevant adjustment parameter is required to be significant at the one percent level. Third, the linkages are allowed to vary by commodity and season.

We then use these market linkages to generate a matrix of market linkages that forms a network. Further, we normalize each row so that it is equal to one. Finally, we employ the PageRank measure (Brin and Page (1998)) as our preferred estimate for a market's systemic

influence. The PageRank provides a higher score to markets that exert a greater influence on the system. We use PageRank estimates because a given market’s systemic influence is based not just on the number of markets it influences, but also on the influence that those markets exert on other markets in the system, and so on in a recursive fashion.

Figures 1 and 2 show the network of market linkages for domestic maize markets and relevant external markets. The size of the node corresponds to its PageRank (see full paper for details). The external markets are shown in red, while domestic markets are in gray. During the harvest season, Nairobi is the focal market for demand shocks. However, Nampula is an important source for demand shocks during the maize harvest, and the primary external market during the lean season. Nampula is linked to the ports of Lindi, Dar es Salaam and Tanga, but most importantly also linked with all the markets in the Southern Highlands.

Figure 3 shows the corresponding rice market network during the harvest season. Bukoba (a Lake Victoria port) is 7 times as influential as Dar es Salaam during the harvest — which speaks to the importance of demand from Kenya and Uganda. These markets adjust to markets that in turn adjust to other markets. Figure 4 shows that demand shocks to the rice market network, during the lean season originate in Asia – although, officially tariffs are high, and imports from Asia are intermittent.

Figure 1: The Domestic Maize Market System During the Harvest Season

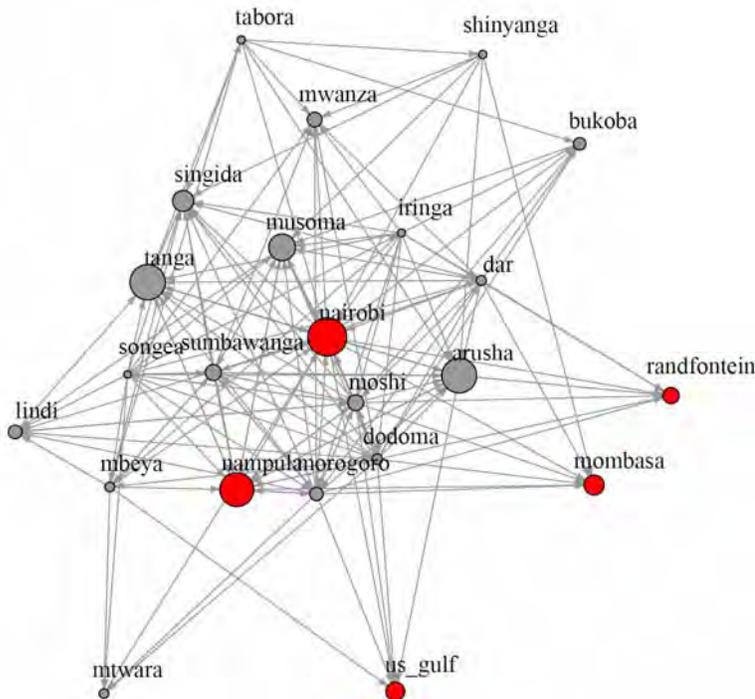


Figure 2: The Domestic Maize Market System During the Lean Season

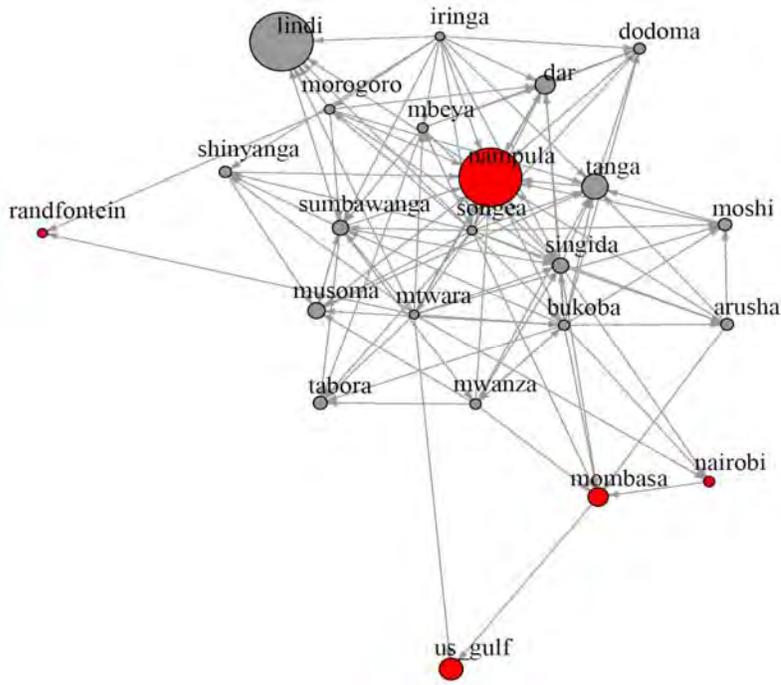


Figure 3: The Domestic Rice Market System During the Harvest Season

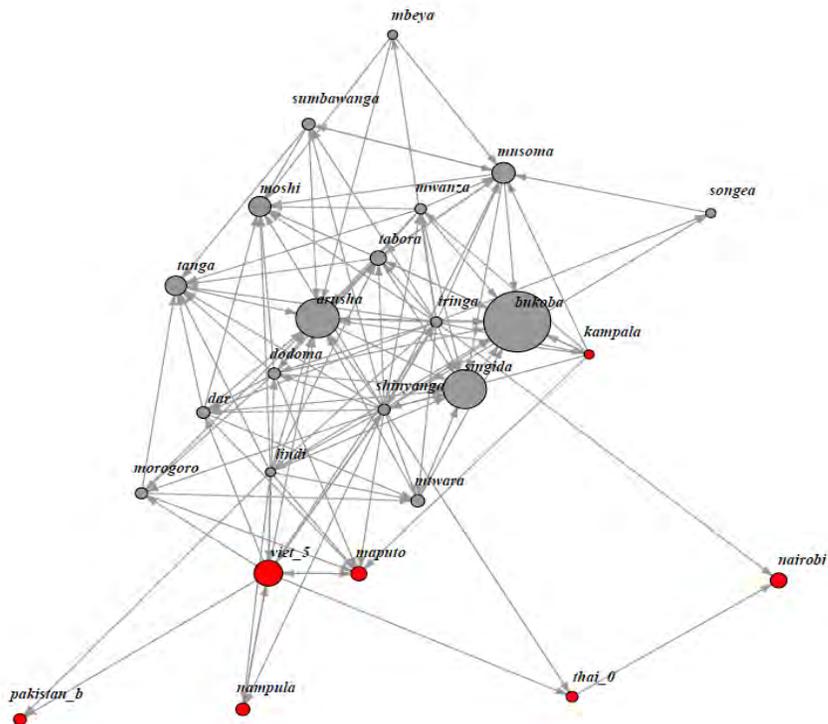
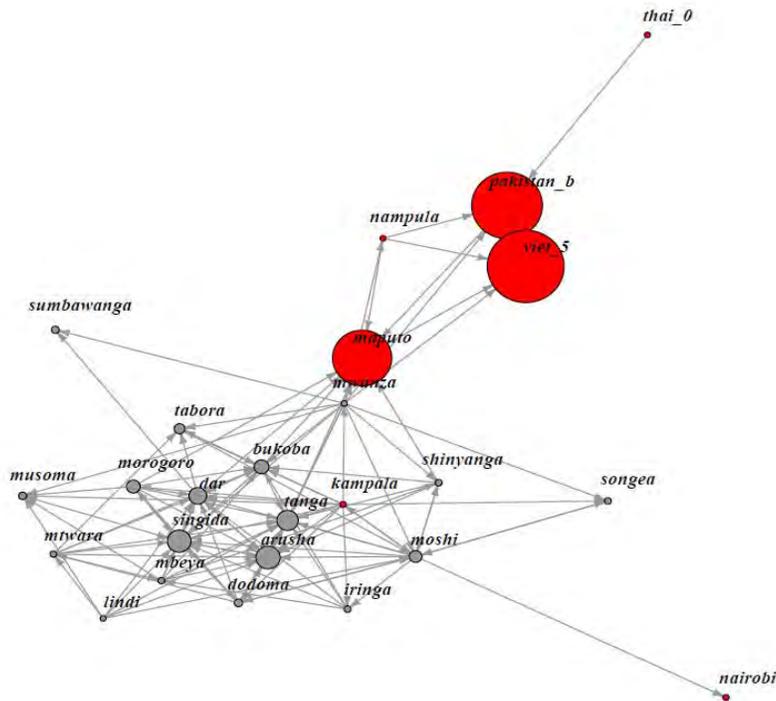


Figure 4: The Domestic Rice Market System During the Lean Season



Conclusion

This Policy Research Brief shows that the sources of exogenous demand shocks to local food markets originate outside Tanzania. It also shows that markets in areas most suitable for crop production are the ones that are also most vulnerable to systemic shocks. Consistent with these results, price levels are the lowest and volatility is the highest in these areas. This is true for both maize (which has been subjected to frequent export bans and therefore has a negative net protection) and rice (which is protected). Taken together, this suggests that an interventionist trade policy is not an alternative to remedying the inefficiencies that stem from inadequate rural infrastructure.

The research framework also addresses the need to identify a market that may serve as a reference (i.e. benchmark) price for traders and other participants in Tanzania. This benchmark will vary by season and commodity. For local Tanzanian maize markets, the price in Nairobi may serve as the benchmark during the Tanzanian harvest season. However, during the lean season, Nampula is the primary reference market. For rice, Bukoba is the primary market during the harvest season, while Arusha is also important. However, during the lean season, despite restrictions on formal rice imports, international markets (Vietnam and Pakistan) are the appropriate price benchmarks.

More generally, amidst the multitude of available regional and world price information, policy makers need to develop a more precise understanding of the origins of the external influences on domestic food markets. The methods and results, summarized in this brief, may be used to identify the most influential external markets. This will, in turn, lead to an improved understanding of the external sources of domestic food price volatility.

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Mentoring Young Professionals Enhances Career Development

Aneth Kayombo, who earned her Master of Science in Agricultural Economics from Sokoine University of Agriculture (SUA), explains how she managed to gain experience to become an expert agricultural policy analyst. Like many university graduates equipped with theoretical knowledge, she was eager to apply those lessons to real life as soon as she completed her coursework.

Ms. Kayombo joined the SERA Policy Project, a USAID Feed the Future Initiative, as an assistant policy analyst in 2012 to work closely with the Senior Policy Advisor supporting policy analysis activities. She narrates the story of her experience as a student at Sokoine University of Agriculture, a database management assistant with iAGRI, and then a policy analyst with SERA Project.



“...working closely with highly talented policy analysts enhanced my practical knowledge and now I consider myself competent to work as an agricultural policy analyst.”

As a masters student I was required to conduct research. I shared my thesis, entitled “The Effects of Taxes, Duties and Fees on the Grape and Grape Wine Industries in Tanzania” with my supervisor who then introduced me to iAGRI and the SERA Project as a way to obtain financial support to conduct my research. I was offered temporary employment with iAGRI to create a database for scholarship applicants. Three months later, I received a job offer from SERA to assist in policy analysis. After joining SERA, I gained a new perspective towards policy analysis and it has always been a great experience ever since.

What did you learn?

I gained skills in database management, how to look at policy issues from different angles, how to interact with Government Officials and other stakeholders for better results and goal achievement. I also learned different ways of analysing food security policies and their impact on food security, economic growth, and poverty, as well as how to communicate policy findings and influence policy reforms/changes in the Government. I attended a course on how to prepare written policy reports and trainings. I learned to support junior staff on data analysis and monitoring and evaluation.

What do you think are your best achievements?

I gained knowledge and skills on Food Basket Methodology while working with the United States Department of Agriculture (USDA) Economic Research Service (ERS) expert when conducting training for the Zanzibar Department of Food Security and Nutrition (DFSN). The department has

incorporated the methodology in their ongoing food security and nutrition monitoring activities. With the knowledge of FBM, I managed to present a paper during the Annual Agricultural Policy Conference in 2014 titled “Measurement of Regional Food Basket Costs in Tanzania”.



Ms. Kayombo assisting trainees during a Policy Analysis class in Zanzibar.

In October 2015, I was invited to attend the 2nd Annual ReNAPRI Stakeholder Conference in Mozambique. The theme of the workshop was Anticipation of the Future of Agriculture in Eastern and Southern Africa: Outlook for Maize, Wheat, Rice and Sugar.

In conclusion, I learned that when influencing policy changes in the Government, we need to revise our assumptions with patience but also consider the time factor. With evidence and good cooperation, there is always room for policy changes.

SERA Policy Project supports MAFC to improve the policy and regulatory environment for agriculture growth and to build a group of public sector institutions, advocacy organizations, and individuals capable of performing rigorous policy analysis and advocating for policy reform. In this role SERA has conducted evidence based studies on the maize export ban in 2012. Findings from this study influenced the Government of Tanzania decision to lift the export ban.

Story and photo submitted by USAID/Tanzania SERA Policy Project.



Food Basket Methodology Training Strengthens Zanzibar Food Security Monitoring

The Department of Food Security and Nutrition (DFSN) in Zanzibar has relied on food availability measures to monitor food security trends. With this approach they were only monitoring one out of the four pillars of food security namely availability, leaving the other three pillars (access, utilization and sustainability) unmeasured and unmonitored on a consistent basis.

In 2014 the SERA Policy Project, in collaboration with Economic Research Service (ERS) of the United States Department of Agriculture (USDA), introduced the Food Basket Methodology (FBM) to measure access to food.

Ms. Mansura Kassim, the Director of Food Security and Nutrition (DFSN) Department, and her staff expressed strong interest in learning and incorporating the methodology into the Zanzibar food security early warning monitoring system. As a result, SERA and USDA ERS designed the basic assessment model, sponsored a series of trainings for the DFSN, and supported stakeholder outreach.



Mansura Kassim, Director of Department of Food Security and Nutrition, Ministry of Agriculture Zanzibar

The DFSN has started to apply the FBM tool to generate evidence-based food access indicators and included them in its quarterly reports to the government. Ms. Kassim indicated that the methodology has added value to food security monitoring. “I managed to present the FBM findings covering the last four years during the National Commission’s Meeting chaired by the President of Revolutionary Government of Zanzibar Dr Mohamed Shein; the audience were very impressed with the statistical evidence,” says Ms. Kassim. It was observed that access to food has improved since 2010. However, the bottom quintile (the poorest 20 percent of the population) remains the most food insecure, spending more than 80 percent of their income on food. The second bottom quintile was found vulnerable to food insecurity, spending more than 55 percent of their income on food.

The FBM allows the DFSN to measure access to food by comparing per capita monthly cost of a representative basket of foods, referred to as a Food Basket Cost (FBC), with an income estimate¹. Monitoring food costs relative to consumer purchasing power can indicate a need for further analysis to identify causes and actions required to address the problems. A decline in the cost of food and/or increase in income are expected to improve the food security of a household.

¹ A representative basket reflects the range of foods that are actually consumed but does not necessarily fulfil nutritional guidelines.



About the Food Basket Cost

The cost of the food basket is calculated using calorie shares derived from the Household Budget Survey conducted by Zanzibar's Office of the Chief Government Statistician (OCGS) and monthly average retail prices collected by OCGS. Using the calorie shares, a food basket was constructed consisting of 18 food items which provide an average daily calorie intake of 2,150 per person. Per capita daily consumption was multiplied by 30 to derive a monthly food basket, which was then multiplied by retail prices to compute the monthly cost of the representative food basket. The 18 food items account for 96.6 percent of daily calorie intake. The food items included in the basket were maize flour, rice, beans, bananas, millet/sorghum, round and sweet potatoes, wheat, raw cassava, yams, coconut, poultry, beef/goat, fish, cooking oil, sugar, fruits, and vegetables.

The FBC provides an early warning of increasing food cost and offers valuable insights into the impact that individual food items have on the overall food basket cost. For instance, in Zanzibar rice is the main staple food accounting for 28% of total calories in the typical diet but it accounts for only 15% of the total cost of the food basket. Hence, an increase in rice prices has less of an impact on food costs and food security than implied by its calorie share. In contrast, fish contributes less in calories--4%--but much more to the food basket cost--19%.

The department is conducting more research on the composition of food baskets for different income quintiles. In future work, they will explore options for constructing a low-cost healthy food basket that provides a nutritionally balanced diet while taking into account available local foods and preferences.

Story and photo submitted by USAID/Tanzania SERA Policy Project.



The Early Success of the Rice Council of Tanzania

Despite the increase in local rice production in recent years, the Government of Tanzania has allowed for the importation of rice when the need arises. In 2013, the government authorized duty-free imports of 30,000 tons of rice in response to rising domestic rice prices. More than 85,000 tons were actually imported due to weak monitoring and enforcement of policy by the customs authority. The duty free rice imports caused considerable disruption within the Tanzanian rice industry. Both the Government of Tanzania and the private sector recognized the urgent need to develop a more cohesive industry environment. As a result, the Rice Council of Tanzania (RCT) was established in 2014 with the goal of promoting policy, business, and investment environments to support the growth of the rice industry.

The newly established RCT requested USAID Feed the Future SERA Policy Project support in preparing their first five-year organizational strategic plan. SERA recruited consultants for the activity and covered costs associated with a three-day stakeholder workshop. A comprehensive strategic plan was developed setting milestones for RCT for the years 2015 to 2019. The RCT Board of Directors and management have made a commitment to the implementation of the strategic plan.



The RCT greatly valued the investment and support received from SERA Policy Project. “The financial and technical support from SERA Policy Project has increased RCT’s recognition and visibility and currently being consulted by various organizations and government ministries on rice issues on daily basis thus it’s now the ‘go to’ representative for the rice sector” remarked Ms. Winnie Bashagi, the RCT Executive Director.

SERA also facilitated research activities whose findings contributed to building a strong policy advocacy agenda on the importation of cheap rice from Asia into the Tanzania mainland. These findings have formed evidence-based advocacy that has resulted in the Government issuing a statement suspending rice import permits and tightening security to curb rice smuggling and illegal importation.

RCT used research findings to organize campaigns that have raised its portfolio, visibility, and recognition internationally. The Executive Director of RCT has been elected a Vice President of the Africa Rice Advocacy Platform (ARAP).

SERA Policy Project has provided support to the Department of Food Security and Nutrition of the Ministry of Agriculture, Livestock, Fisheries Development in the Mainland and to the Ministry



of Agriculture and Natural Resources of Revolutionary Government of Zanzibar. SERA has also provided capacity building to various advocacy groups and private sectors.

Story and photo submitted by USAID/Tanzania SERA Policy Project.



Forums to Discuss Research Findings are Vital to Expedite Policy Reform Process

In 2012, Tanzania joined New Alliance for Food Security and Nutrition (NAFSN) in Africa and has committed to policy actions in the areas of business enabling environment, inputs, land, nutrition, and trade and markets. In order to achieve the objectives of NAFSN these, a package of reforms in agricultural policy is necessary. However, the pace for policy reforms within the government structure has been slow due to the lack of resources and capacity to conduct evidence-based studies to inform decision makers on necessary changes.

The USAID SERA Policy Project began in 2011 with the objective of assisting both the Government of the Republic of Tanzania (GoT) and the private sector to enable a broad-based, sustainable transformation of the agricultural sector through policy reform. In 2013, SERA joined a voluntary Policy Analysis Group (PAG)¹ to coordinate and share information on policy research that supports the effort of the government of Tanzania and other development practitioners in bringing agricultural transformation to Tanzania. The PAG is comprised of researchers, agricultural projects and programs, academia, and local policy think tanks. Each PAG member conducts various studies which are important to inform decision-makers.

To enhance coordination and information sharing of research findings, PAG initiated the Annual Agricultural Policy Conferences (AAPC) on topical issues where several papers have been presented and discussed, and recommendations made to the GoT. To date, two annual forums have been organized with the participation of stakeholders from government, private sectors, donor funded programs and projects, media, and academia. During the two events, PAG members had an opportunity to discuss successes and lessons learned and to identify remaining gaps, challenges, and emerging issues in agricultural policies.

Key decision makers have recognized the important role of these forums which bring national and international stakeholders together to review what is being done and what are the best practices. "The demand for analytical policy recommendations has increased among decision makers through lessons learnt from the dialogues of the last two AAPC," remarked Dr. David Nyange, Michigan State University Associate Professor and Senior Policy Advisor to the Ministry of Agriculture, Livestock and Fisheries.

Story and photo submitted by USAID/Tanzania SERA Policy Project.

¹ PAG members: Agricultural Non State Actors Forum (ANSAF), Alliance for Green Revolution in Africa (AGRA), Regional Strategic Alliance and Knowledge Support System (ReSAKSS), Monitoring African Food and Agriculture Prices (FAO-MAFAP), Economic and Social Research Foundation (ESRF), East Africa Grain Council (EAGC), and the Agricultural Market Development and Trade (AMDT). Other members include USAID-funded Africa Lead and SERA Project, the Sothern Agricultural Growth Corridor of Tanzania (SAGCOT), Michigan State University, and REPOA.



Implementing a Food Basket Methodology to Improve Food Security System in Tanzania

Tanzania's approach to address food insecurity was based on the delivery of free or subsidized maize to food insecure households. The Department of Food Security and Nutrition (DFSN) of the Ministry of Agriculture, Livestock and Fisheries (MALF), together with other stakeholders, conducted a survey twice a year to identify food insecure households. The final report was presented to the Prime Minister's Office (PMO) advising on how much maize should be delivered and where. In 2012, USAID Feed the Future SERA Policy Project, in collaboration with United States Department of Agriculture's Economic Research Services (ERS), analysed the approach and found a general lack of accurate information on regional and district food production and requirements. Also the approach focused too narrowly on maize deficits, ignoring potential availability of other types of food and potentially over-estimating maize requirements.

USDA presented these findings at a meeting of Tanzanian Government officials in June 2012 and introduced the concept of a food basket as a way to measure access to food. In response, the former Director of Food Security and Nutrition requested training in the methodology for his staff. The Food Basket Methodology (FBM) measures changes in access to food through the calculation of the monthly cost of a representative food basket. Access is defined as the ratio of the total cost of the food basket to income. The methodology can help measure the impact of a price shock for a specific commodity, such as maize, on the total cost of the food basket, as prices are weighted by the commodity's share in consumption. The analysis requires monthly retail prices of the foods in the basket broken out at a regional level. These prices are collected by the National Bureau of Statistics (NBS) and the Ministry of Industry and Trade (MIT).

Between 2014 and 2015, USDA and SERA provided three training sessions for the DFSN on the food basket methodology. Results were presented at a stakeholders meeting in September 2015. During that meeting several challenges were identified. The DFSN wanted to analyse food access at the district level; for that, they needed district level prices and consumption data. The team also wanted a more accurate measure of income.

In order to meet those challenges, the DFSN team identified an alternative source of data: the Household Economy Approach (HEA). This survey provides income and expenditure data by *livelihood zone*. There is not a one-to-one correspondence between livelihood zones and administrative districts, but the team found considerable overlap in a number of cases. The survey is not designed to monitor per capita food consumption, but it was possible to use the survey data to estimate consumption.

In April 2016, with assistance from SERA, the DFSN chose four districts for a pilot study: Masasi, Longido, Kilosa, and Bahi. The team extracted per capita consumption data from the HEA and



completed a preliminary analysis of the four districts. The team used the consumption estimates to construct food baskets for four income groups: very poor, poor, middle, and, better off.

In May 2016, joint DFSN-SERA-USDA teams travelled to two of the pilot districts—Masasi and Longido—to present findings to district officials and seek their cooperation to provide some of the missing price data. The district officials reacted quite positively to the presentations, and they have now agreed to start collecting prices for foods such as sugar, vegetable oil, fruits, and vegetables, which they were not collecting.

During the May field visits, the research team had some initial discussions of the concept of a “healthy” food basket and noted that the data from both Masasi and Longido suggest little or no consumption of fruits and vegetables. Using the Tanzanian Food Composition Tables, it was possible to calculate the nutrient content of the district food baskets. The nutrient content turned out to be seriously deficient in most micro-nutrients, even for better off households. During the field visits, we met with district-level nutritionists who confirmed the low fruit and vegetable consumption. The low consumption is due in part to cultural resistance to eating them. There are a number of education efforts underway to raise awareness of the importance of these foods in household diets.

USDA-ERS will continue to provide support for this activity and will develop a plan for expanding the analysis to additional districts.

Story and photo submitted by USAID/Tanzania SERA Policy Project.

List of Deliverables for SERA Policy Project

Agriculture Business Environment

Business Environment for Tanzanian Agriculture - Report

Annual Reports

Annual Report Year 0.5 (Apr - Sep 2011)

Annual Report Year 1 (Oct 2011 - Sep 2012)

Annual Report Year 2 (Oct 2012 - Sep 2013)

Annual Report Year 3 (Oct 2013 - Sep 2014)

Annual Report Year 4 (Oct 2014 - Sep 2015)

Back-to-Office Reports

Feed the Future USAID 1st Semi-Annual FTF Partners Meeting, Back-to-Office Report

Seed Industry Stakeholders' Workshop Arusha June 3, 2011, Back-to-Office Report

Trip to Arusha to Investigate the Impact of the Export Ban, Aug 3-5, 2011, Back-to-Office Report

Branding

Branding Strategy and Marking Plan

Capacity Building

Capacity Building Matrix

Capacity Building Action Plan

Agricultural Council of Tanzania Strategic Plan, 2015-2019

Study Tour

Rice Council of Tanzania Strategic Plan, 2015-2019

Rice Study

Zanzibar FSN

Zanzibar Agricultural Policy Review

Zanzibar Food Security and Nutrition Department - Strategic Prioritization Plan

Cereals and Other Produce Act

Review of the Cereals and Other Produce Act of 2009

Collateral Registry

Basics of Secured Transactions

Background on Secured Finance

Power Point Presentation

Drivers of Maize Prices

Final Report

Power Point Presentation

Final Report

Food Basket Methodology

Food Basket Analysis Methodology - Feasibility Report

Food Basket Analysis as a Tool to Measure Food Access in Tanzania 2013

Abstract – Measurement of Regional Food Basket Costs in Tanzania, December 4, 2014

Proposal – USDA ERS Proposal for a Nutritious Food Basket

Proposal - Food Basket Methodology Pilot

Proposed Food Basket Analysis for Tanzania, February 6, 2013

Training

Training of Trainers Participants' Manual

Training of Trainers Facilitators' Guide

Training of Trainers Knowledge Evaluation Questionnaire
Training of Trainers Training Skills Evaluation Template
Power Points for Training Sessions 1-14
Training, Basic Economic Principles for FBM
Food Basket Methodology Training, June 10-20, 2014
Food Basket Methodology Training, November 6 – 7, 2014
Knowledge Evaluation – Food Basket Methodology Training, November 7, 2014
Zanzibar Food Basket Methodology Training, November 4 – 5, 2014

Food Demand Study

Final Report

Food Security Workshop June 2012

SERA Main Messages

AIRD Study of Policy Options For Increasing Exports of Maize and Rice

IFPRI Economy-wide Impact of Maize Export Ban on Agricultural Growth and Household Welfare – Tanzania: A Dynamic CGE Model

USDA – Strengthening Tanzania’s Safety Net: Alternative Program and Policy Options to Support Food Security

Agriculture and Trade Opportunities For Tanzania: Past Volatility and Future Climate Change

Food Security Workshop September 2013

AIRD – Assessing the Impact of Export and Import Policies on Staple Food Trade in Tanzania

AIRD – Tanzania’s National Food Reserve Agency’s Role in Assessing Food Security

Assessment of Tanzania’s Food Security Early Warning System, June 27, 2014

SERA – Main Messages

SERA – The Importance of Stable and Transparent Agriculture Policies

Food Security Workshop February 2015

SERA – Main Messages and Policy Recommendations

SERA – Policy Options for Food Security, Economic Growth and Poverty Reduction

SERA – Policy Options Power Point Presentation

AIRD – Holding Adequate Food Reserves

AIRD – Holding Adequate Food Reserves Power Point Presentations

SERA – Rules-Based System for Emergency Food Imports

SERA – Rules-Based System for Emergency Food Imports Power Point

Foreign Taxes

Interim Reports for Years .5-5

Final Reports for Years .5-5

Maize Gender Study

Gender and Maize Final Report

Gender and Maize Productivity and Marketing in Tanzania

Maize and Rice Market Efficiency

Report on Maize and Rice Market Efficiency – Cross Border Transmission of Demand Shocks

Study of Policy Options for Increasing Exports of Maize and Rice - AIRD 2012

Study of Maize Market Efficiency

Tanzania Rice Prices and Import Policy Analysis, April 12, 2013

Abstract – Drivers of Maize Price in Tanzania, December 4, 2014

Drivers of Maize Prices Report

Analysis – Rice Sector, January 2015

Survey Tool – Rapid Rice Assessment

Zanzibar Rice Irrigation 2013

Research – Maize Market Efficiency, 30 September 2015
Assessment Report – Tanzania Rice Sector Market Assessment, May 2015
Rice Market Efficiency Report 2016

MUCHALI

Scope of Work for MUCHALI Study
MUCHALI Report
MUCHALI Framework Capacity Building Action Plan

Policy Briefs

SERA Policy Brief No. 1: Time to Re-think the Food Crops Export Ban, August 2012.
SERA Policy Brief No. 2: A Secured Transaction/Collateral Registry System Can Unlock Credit to Smallholders and SMEs, June 2015.
SERA Policy Brief No. 3: Food Basket Costs in Tanzania, September 2015.
SERA Policy Brief No. 4: The Business Environment and Incentives for Tanzanian Agriculture, April 2016.
SERA Policy Brief No 5: Policy Options for Food Security, Agricultural Growth and Poverty Reduction in Tanzania, April 2016.
SERA – World Bank Policy Brief No. 6: The Effects of Gender on Maize Production and Marketing in Southern Tanzania, June 2016.
SERA Policy Brief No. 7: Rules-Based Transparent System for Emergency Food Imports, July 2016.
SERA Policy Brief No. 8: Food Demand in Tanzania, August 2016.

Policy Research Briefs

SERA Policy Research Brief No. 1: Drivers of Maize Prices in Tanzania, November 2014.
SERA Policy Research Brief No. 2: Cross Border Transmission of Demand Shocks, August 2016.

Policy Conference February 2016

Agriculture Business Environment Power Point Presentation
Land Compensation Schemes and Valuation Models Power Point Presentation
Modern Secured Transactions Law Power Point Presentation
Policy Options for Food Security, Agricultural Growth, and Poverty Reduction Power Point Presentation

Policy Notes

Policy Note - Agriculture Policy Note for New Government - World Bank
Policy Note – Agriculture in Tanzania, September 2015

Policy Options for Food Security

Policy Options for Food Security Report
Policy Options for Food Security Power Point Presentation
Summary of Policy Options Workshop

Prices MIT

Maize and Rice Prices 2010-2016

Prices NBS

Retail Prices 2011-2015

Property Inventory

Property Disposition Plan

Quarterly Reports

Quarterly Report Apr-Jun 2011 (Y0.5-Q3)
Quarterly Report Jul-Sep 2011 (Y0.5-Q4)
Quarterly Report Oct-Dec 2011 (Y1-Q1)

Quarterly Report Jan-Mar 2012 (Y1-Q2)
Quarterly Report Apr-Jun 2012 (Y1-Q3)
Quarterly Report Oct-Dec 2012 (Y2-Q1)
Quarterly Report Jan-Mar 2013 (Y2-Q2)
Quarterly Report Apr-Jun 2013 (Y2-Q3)
Quarterly Report Oct-Dec 2013 (Y3-Q1)
Quarterly Report Jan-Mar 2014 (Y3-Q2)
Quarterly Report Apr-Jun 2014 (Y3-Q3)
Quarterly Report Oct-Dec 2014 (Y4-Q1)
Quarterly Report Jan-Mar 2015 (Y4-Q2)
Quarterly Report Apr-Jun 2015 (Y4-Q3)
Quarterly Report Oct-Dec 2015 (Y5-Q1)
Quarterly Report Jan-Mar 2016 (Y5-Q2)
Quarterly Report Apr-Jun 2016 (Y5-Q3)

Rice Duty Free Imports

Tanzania Rice Prices and Import Policy Analysis April 13, 2013
Rice Price Analysis, January 30, 2015

Rules-Based Transparent System for Emergency Food Imports, June 30, 2016

Report Rules-Based Transparent System for Emergency Food Imports
Power Point -Rules-Based Transparent System for Emergency Food Imports

Seed Policy

Position Paper on Taxes and Duties on Seeds
Report – Proposed Seed Tax Reforms in Tanzania, May 8, 2013
Exempt Taxes on Seeds and Seed Packaging Materials in Tanzania

Staples Food Study

Staples Bulletin August 1, 2016

Stata

Stata Training Report

Training – Basic Economic Principles Zanzibar

Power Point Basic Economic Principles Zanzibar, February 18, 2016

Training –Market Intelligence Unit, Bagamoyo, July 12-15, 2016

Course Outline
Power Point Presentations
Basic Economic Principles
Excel Review
Word Review
Statistical Methods
Food Consumption Patterns in Tanzania
Global Food Markets
Global Sugar Markets
Regional Cereals Markets

Training – Policy Analysis Course Zanzibar

SERA Policy Analysis Course Outline-Zanzibar 2012
Power Points for Classes 1-8

Trip Reports

Tanzania Secured Financing Reform Trip Report
Secured Financial Transactions Trip Report
Southern Highlands and Northern Zone Trip Report

Southern Highlands Field Trip Report
Northern Border 2013 Field Trip Report
USDA ERS Trip Report – Proposed Food Basket Analysis for Tanzania
Agriculture Business Environment, Zambia Study Tour 2015 Trip Report
Agriculture Business Environment, Tanzania Study Tour 2015 Trip Report
Agriculture Business Environment, Mozambique Study Tour 2016 Trip Report

Work Plans

Year 1 Work Plan (Oct 2011 - Sep 2012)
Year 2 Work Plan (Oct 2012 - Sep 2013)
Year 3 Work Plan (Oct 2013 - Sep 2014)
Year 4 Work Plan (Oct 2014 - Sep 2015)
Year 5 Work Plan (Oct 2015 - Aug 2016, proposed)

Workshops

Policy Workshops Report
Measuring Access to Food: A Food Basket Approach, by Nancy Cochran, Economic Research Service, USDA, Presented at Food Security Workshops, September 11, 2013 - Report
Tanzania National Food Reserve Agency's Role in Assuring Food Security in Tanzania, Dirck Stryker, Associates for International Resources and Development, Presented at Food Security Workshops, September 11, 2013 - Report
Assessing the Impact of Export and Import Permits on Staple Food Trade, Mukhtar Amin, Economist, Associates for International Resources and Development, Presented at Food Security Workshops, September 11, 2013 - Report
The Importance of Stable and Transparent Agricultural Policies, Don Mitchell, SERA Project, Presented at Food Security Workshops, September 11, 2013 - Report

Zanzibar Irrigated Rice Profitability Study

SOW for Study of Profitability of Irrigated and Rainfed Rice, July 10, 2013
Report on Profitability of Irrigated and Rainfed Rice on Zanzibar, July 7, 2014
Power Point Presentation, July 18, 2014