



Leveraging Regional Policy Successes to Improve Interventions by the FRA and the Performance of Maize Markets in Zambia

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Acronyms

ECOWAS	Economic Community of West African States
FRA	Food Reserve Agency
GoG	Government of Ghana
MoFA	Ministry of Food and Agriculture
NCPB	National Cereals and Produce Board
NAFCO	National Food Buffer Stock Company
SACCO	Savings and Credit Cooperatives
SSA	Sub Saharan Africa
TWLB	Tanzania Warehouse Receipt Licencing Board
WRS	Warehouse Receipt System
ZACA	Zambia Agricultural Commodities Agencies
ZAMACE	Zambian Commodity Exchange

Acknowledgements

CUTS is implementing a project entitled, 'Competition Reforms in Key Markets for Enhancing Social & Economic Welfare in Developing Countries' (CREW Project), in four countries: Ghana, India, Philippines and Zambia, and across two common sectors: Staple Food and Bus Transport with the support from DFID (UK) and BMZ (Germany) facilitated by GIZ (Germany). One of the main goals of this project is to demonstrate the benefits of competition reforms.

We would like to begin by expressing our deepest gratitude to DFID (UK), BMZ (Germany) and GIZ (Germany) for their extensive support and involvement in this project.

Following a study that CUTS published under this project entitled 'Zambia Food Reserve Agency Pricing Mechanisms and the Impact on Maize Markets', CUTS undertook a follow up study entitled 'Leveraging Regional Policy Successes to Improve Interventions by the Food Reserve Agency and the Performance of Maize Markets in Zambia'. This research study was coordinated and by CUTS International, Lusaka team and undertaken by CUTS Consultants Natasha Chilundika and Kelvin Mulungu.

We would firstly like to thank the Ministry of Agriculture, in particular Hon. Given Lubinda, Minister of Agriculture, for his support and the guidance to CUTS Lusaka throughout the writing of this report. We look forward to continued collaboration in this important area.

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Lastly, we would also like to express appreciation to the various institutions that attended our stakeholder meetings which were organised to elicit feedback on the findings and recommendations of the report. These included: the Food Reserve Agency (FRA), the Zambia Governance Foundation (ZGF), the Zambia Public Procurement Authority (ZPPA), the Ministry of Commerce Trade and Industry (MCTI), the Grain Traders Association of Zambia (GTAZ), the Centre for Trade Policy and Development (CTPD), the Indaba Agriculture Policy Research Institute (IAPRI), the Jesuits Centre for Theological Reflection (JCTR), the Zambia Commodity Exchange (ZAMACE) and the Competition Consumer Protection and Commission (CCPC).

In conclusion any errors that may have remained are solely our responsibility.

Chenai Mukumba
Centre Coordinator
CUTS Lusaka

Foreword

It is with profound gratitude that I propose the Foreword to this Report, which is a product of the challenge that I posted to the CUTS team to conduct a comparative study on maize policies and markets in Zambia and neighbouring countries.

Maize is a very important crop. Worldwide consumption of maize is more than 116 million tonnes, with Africa consuming 30 percent and sub-Saharan Africa 21 percent. Eastern and Southern Africa uses 85 percent of its production as food, while Africa as a whole uses 95 percent, compared to other world regions that use most of its maize as animal feed.

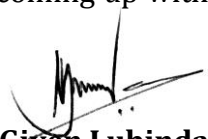
90 percent of white maize consumption is in Africa and Central America. It fetches premium prices in Southern Africa where it represents the main staple food. Because of the above factors, maize marketing tends to attract much more public attention than many other crops. The way it is managed has very significant political ramifications. It is known to have brought down governments. In view of the above, there is need to keep abreast with regional if not global trends on how this crop is managed. When I challenged the CUTS team to conduct the study it was with the aim of gathering best practices in the way that maize is managed generally and marketed in Zambia and her neighbours. I am delighted that the team expanded the scope of the study to cover the following aims:

1. To conduct an extensive analysis of strategic grain reserve agency operations in the region to identify demonstrated good practice of policy implementation;
2. To recommend practices that can work for Zambia, given the current status of maize market; and
3. To outline the actions that need to be undertaken to achieve the recommendations.

The study presents very interesting findings which should inform decision-makers on this important topic. I shall encourage all officers in the Ministry of Agriculture who are involved in the management of maize and particularly those in the Food Reserve Agency to read this report. I also recommend it to all those who have an interest in agromarketing.

It is my sincere hope that this study shall inspire other non-governmental and other civil society organisations to take keen interest in generating evidence-based recommendations on important policy options affecting our country. In this vein, I hope to see more work of this nature from CUTS and indeed other players. In addition, I strongly recommend that such studies are disseminated as widely as possible so as to develop well-informed public discourse.

Finally, I commend the researchers and all others who were involved in coming up with this Report.


Given Lubinda
Minister of Agriculture, Zambia

Executive Summary

While grain marketing boards in Africa have remained major players in maize markets, their effects have been shown to be negative on both the development of agriculture markets and the participation of the private sector. Facing the classical ‘food price dilemma’, where governments want to raise the price of maize for producers and at the same time keep it low for consumers, governments have engaged in a host of interventions that have not been efficient and effective in achieving intended welfare policy goals. In this paper, we pick some good lessons from other African countries that can act as best practices for the Food Reserve Agency (FRA) in Zambia. The following countries provide good experiences that Zambia can learn from; Tanzania, Ghana and Kenya.

Tanzania’s Strategic Grain Reserve is usually hailed for having low negative impacts on agriculture markets in the country. This is because it is not highly involved in grain marketing activities, but instead provides information to different market players and stakeholders to make grain markets competitive. By purchasing less than two percent of nations’ total production, the agency allows the market to operate freely, resulting in more stable prices and less maize price volatility than most other African countries. This lack of heavy government involvement in commodity markets has further contributed to the successful functioning of the warehouse receipt system in the country.

In Ghana, the National Food Buffer Stock Company (NAFCO) uses the private sector for procuring maize. This is similar to how the FRA was purchasing commodities before its mandate was extended beyond maintaining national strategic food reserves. NAFCO operates as an independent entity and aims to make marginal profits to support its operations. As such, the agency does not put a strain on the nations fiscal budget. Further, NAFCO buys less than five percent of national production, but research shows that the company has had a positive impact on reducing price volatility and keeping grain prices low in the areas where the company operates.

Finally, another key lesson comes from Kenya’s National Cereals and Produce Board’s (NCPB) use of a price band. Though it has been implemented with challenges in Kenya, the price band can help reduce distortionary effects of government interventions on agriculture markets. A price band gives a range within which the price of a commodity has been allowed to vary by the government. As such, the price band allows government action to be more predictable and allows private players to make strategic decisions with regards grain marketing. The width of the band needs to be arrived at through a consultative approach with the participation of key stakeholders to help determine the indicative ‘ceiling’ and ‘floor’ price.

With these lessons highlighted, the following recommendations have been made regarding the operations of the FRA in order to improve the functioning of maize markets, and the agriculture sector in general:

- Restrict FRA purchases to the national strategic reserve, and purchases should be targeted at outlying areas that are not along the line of rail.

- Use a price band to signal when government intervention in the market should be expected to occur beyond the purchase of national strategic reserves.
- In the long-term, the FRA should aim to make purchases through Zambia Agricultural Commodities Exchange (ZAMACE) in order to avoid distortionary effects on the market.

For all these recommendations to work well, the organisation of the political economy is more important in making things work than the economic or theoretical underpinnings.

“Among the key constraints to the adoption of the most appropriate policy from an agricultural development perspective is the political economy of decision making.”

(Morrison and Sarris, 2009:408).

Introduction

Zambia Food Reserve Agency Mandate

The FRA was set up as the implementing arm of the Food Reserve Act passed by the Parliament in 1995 with a strict mandate of buying and holding only national strategic commodity food reserves and achieving market price stabilisation. After its establishment, FRA market operations were very minimal, with the institution buying from only few districts and less than two percent of total national maize production.

In 2002 however, the FRA increased its maize commodity purchases due to a drought related poor harvest that resulted in the country experiencing a deficit in supply. In 2005, the FRA Act was amended, and it was given the authority to get involved in marketing activities by providing a market to smallholder farmers – allowing it to essentially assume the role of a grain marketing board¹ (Mason and Myers, 2011, and Govereh et al., 2008). Since then, the FRA has become the main market player in maize markets, purchasing about 83 percent of total maize marketed surplus between 2010 and 2012 (Kuteya and Sitko, 2014). Table 1 shows maize purchases by the FRA since 2011.

Government market interventions have been credited with increasing national maize production levels in the country. Policies that have been implemented through FRA and through the Farmer Input Programme (FISP) have led to overall increases in the area under maize cultivation by smallholder farmers. Between 2002 and 2015, the area under maize cultivation increased from about 750,000 hectares to 1.5 million hectares.

Further, in 2014, 89 percent of rural households were involved in the agriculture sector, and accounted for 88 percent of total national maize produced (RALS, 2015). Since 2009, Zambia has had surplus maize production, with total production levels averaging 2.5 million metric tonnes annually.

However, despite this increase in production as a result of government's heavy involvement in the maize sector, FRA policies have not adequately achieved the objective of ensuring food security at the household level. In addition, these policies have had high market distortionary effects on maize markets and the wider agriculture sector.

Policy Interventions by the FRA have been found to be regressive, harming a large proportion of rural households who are net buyers of maize (39 percent), and low income urban consumers through high maize meal prices (RALS, 2015., Mason and Myers, 2009., and Kuteya et al, 2014).

Government interventions in maize markets have also contributed to: i) low productivity in maize production; ii) reduced private sector investment and participation through out

¹ A grain marketing board is a state-controlled or -sanctioned entity established to direct the market and marketing of specific commodities within a given country or other geographic area while an strategic grain reserve is a public stock of grain used to meet emergency food requirements, to stabilise food prices, and to relieve temporary shortages (Mason, 2011).

the maize value chain; iii) inability of Zambia to become a regional maize and maize products supplier; and iv) poor growth of the country's agriculture sector in general (IAPRI 2015., Kuteya and Jayne, 2012., Nkonde et al 2011, and Govereh et al, 2008).

Table 1: Maize Purchases by the FRA since 2011 (in metric tonnes)

Province	2011	2012	2013	2014	2015
Central	280,458	143,158	36,730	127,697	66,861
Copperbelt	107,432	76,858	11,824	36,985	26,389
Eastern	432,540	191,255	77,467	254,757	94,720
Luapula	76,067	76,988	57,371	83,376	71,086
Lusaka	147,233	89,681	17,313	59,372	23,100
Muchinga	109,008	74,885	55,145	106,963	65,850
Northern	159,002	109,212	80,423	147,436	121,428
North Western	89,579	73,883	30,872	58,239	63,013
Southern	334,204	188,263	53,784	143,640	53,373
Western	16,138	21,708	5,319	12,838	10,373
Total	1,751,661	1,045,891	426,248	1,031,303	596,193

Key Market Challenges Resulting from Government Intervention

FRA policy has increased the average price level of maize, but this has not led to ensuring national food security for the poorest and most vulnerable populations. This is because a large number of the rural population comprises of net buyers of maize. The percentage of net buyers changes depending on maize production performance, but they are well over 30 percent of the rural population (according to RALS 2015, net buyers in 2014 were 39 percent). Increased maize price levels for these populations have therefore negatively impacted their ability to purchase maize during the lean season.

Moreover, when the FRA buys maize across the country, they transport it to urban centres for aggregation and storage, leaving little quantities in rural and outlying areas. Therefore, both price, and actual availability of maize grain becomes a challenge for rural households who are net buyers of maize. This is also true for urban consumers that consume maize meal from informal harmer mills.

Increased average price levels of maize, which have been sustained by FRA maize price setting and massive grain purchases have led to increased maize production. However, maize productivity has remained relatively poor, increasing only slightly from 1.321mt/ha in 2002 to 2.10 mt/ha in 2015. A majority of smallholder farmers (70 percent) produce maize on less than two hectares of land. Therefore, low productivity entails low quantities available for consumption among the poorest households. This has contributed to the high number of households that are net buyers of maize, and has had detrimental effects on household level food security. Zambia is among the top countries worst hit by hunger in the world (FAO, IFAD and WFP, 2014). As government agriculture spending is highly concentrated on FRA and FISP activities, investments in production technologies, innovations and research that can lead to significant increases in agriculture productivity has been neglected.

Zambia's maize market sector has become highly concentrated throughout the value chain, contributing to high maize and maize meal prices in the country. In terms of production, while FRA policy is aimed at increasing smallholder incomes, very few smallholder farmers actually sell maize and enjoy the high prices offered by FRA. 50 percent of all maize sold comes from only five percent of smallholder farmers, and these are relatively well off with more land and non-land assets than other smallholders (Kuteya et al, 2011., Nkonde et al, 2011). These well off farmers are the few that have benefitted from increased incomes from FRA interventions. Government intervention has also crowded out commercial farmers, and commercial participation and investments have declined significantly in maize production since 2005.

At other points of the maize value chain, private participation has declined in maize markets again as a result of FRA and wider government policy in the sector. Government intervention in maize markets has been largely discretionary, unpredictable and *ad hoc*, creating uncertainty among private participants who have withdrawn from the market as they view it as a high-risk market. Policy decisions about the FRA price and quantity to be purchased were quite political, and have been observed to be highly influenced by State House and Cabinet (IAPRI, 2015). This has been observed through changes made to the FRA price once it has been announced, and changes made to targeted commodity purchases by the agency. Moreover, as our previous study found, maize purchases by the agency during election years are significantly higher than purchases in non-election years.

Further, private traders have been forced out of the market due to FRA purchasing most of the maize output. Millers have stopped significantly participating in the market through purchasing directly from farmers and traders, as they prefer instead to access subsidised maize that is bought and transported to urban centres by the FRA. On the other hand, FRA practice in the past has been to release maize to only selected large-scale millers, although this was not the case in 2015 when a larger number of millers managed to access FRA subsidised maize. Informal millers have also been forced out of business as they do not access FRA maize and so their operation costs have increased and they fail to make a profit. All this has resulted in the milling sector becoming concentrated, with few millers then influencing the price of commercially milled maize. As such, Zambia has experienced skyrocketing prices and maize meal shortages despite four years of consecutive surplus and bumper maize harvests (Kuteya et al, 2014, and Kuteya and Jayne, 2012).

Study Aims and Objectives

Results from our previous study showed that the price at which FRA purchases maize is significantly positively correlated with expected sales and total production in that year. While this benefits producers, it is undesirable for the market to run efficiently. Market efficiency requires that price and production be negatively correlated when demand is static. Our findings showed that a percentage increase in expected sales leads to a 0.5 percentage increase in price.

With regards quantities purchased, we found that FRA rarely sticks to planned purchases, and a one percentage increase in expected sales leads to a 1.7 percentage increase in quantities purchased by the agency. Further, FRA buys about 1.5 times more maize in an election year than they buy in other years. These findings illustrated that FRA interventions in maize markets are suboptimal, and lead to market inefficiencies. They also put a huge fiscal burden on the national budget as most cases, FRA ends up buying more maize than what was initially budgeted for.

As maize is Zambia's staple food, the government has an obligation to ensure that there are enough strategic reserves of the commodity in the country in case of any supply shocks. This guarantees food security in the country. However, it is clear that current government and FRA policy interventions have not adequately achieved both food security objectives at household level, nor improved incomes for a majority of smallholder farmers. There is, therefore, a need to look at evidence-based policy alternatives that government can learn from and adopt to improve FRA market interventions.

As such, the goal of this paper is to conduct a case review of national strategic grain reserve institutions in the Sub Saharan Africa (SSA) region to provide evidence-based practices of good policy interventions that have been undertaken with minimum market distortionary effects on maize (staple food) markets. Specifically, the paper aims to:

- conduct an extensive analysis of strategic grain reserve agency operations in the region to identify demonstrated good practice of policy implementation; and
- provide recommendations on which of these can work for Zambia, given the current status of maize markets, and outline the actions that can be undertaken to achieve the stated recommendations.

We hope that by providing evidence on how other countries are conducting market interventions that do not lead to extensive market distortion, the government can use these policies to stop the market distortions currently happening in the sector as a result of FRA interventions. This will, in turn, allow price stabilisation, increased production and increased productivity to be attained, with sustained income growth across all market participants.

Regional Case Studies

Ghana's National Food Buffer Stock Company

Ghana's experience with administering a national strategic grain reserve institution comes as recently as 2010. Before that, the Government of Ghana (GoG) put in place various interventions in the agriculture sector to increase production and productivity, including introduction of farming blocks, fertilisers and improved seed subsidies, and subsidies for tractors and other machinery. Most of these interventions were established after the 2007-2008 global food price shocks, and national policy since then has been directed at supporting domestic food production and processing, while also encouraging exports. At national level, the fertiliser subsidy programme, the block-farming programme, agricultural mechanisation centres and the irrigation development programme are estimated to take up about 85 percent of the Ministry of Food and Agriculture's (MoFA) capital budget (FAO, 2015).

To ensure the security of farmers and insulate them against losses resulting from the anticipated increases in production resulting from the above stated interventions, MoFA set up the National Food Buffer Stock Company (NAFCO) in 2010. NAFCO was created with the objective of ensuring stable food grain supplies and prices through purchasing excess market supply and providing proper storage to be able to release stocks back on the market should there be any supply shocks. The company also aims to protect farmers from unfavourable prices during bumper harvest years by guaranteeing a minimum price that allows farmers to earn an income. NAFCO keeps two kinds of stocks – operational and emergency government. Operational stocks are used to run and operate the company, and the emergency government stocks are held for government use in emergency situations.

NAFCO buys three commodities – maize, rice and soya beans. In Ghana, maize makes up 72 percent of total grain output and is the most important cereal consumed. Of total maize produced, about 45 percent is marketed.

Production has been growing since 2008, with about 70 percent of white maize grown by smallholder farms. The country has mostly achieved self sufficiency in maize, with production surpluses attained in some years.

Despite its Economic Community of West African States (ECOWAS) membership, Ghana imposes duties and levies on maize imports amounting to about 37.4 percent.

NAFCO's wide and ambitious mandate covers such activities as; i) providing a minimum guaranteed price and ready market; ii) mopping up excess produce in the market; iii) protecting farm incomes; iv) employing a buffer stock mechanism to ensure stability in demand and supply; v) managing governments emergency food security; and vi) selling to state institutions including agro processors, prisons, hospitals and schools to encourage consumption of locally grown and produced food products. Through these activities, it is expected that NAFCO will contribute to ensuring macro-economic stability.

NAFCO is not a statutory body, but was incorporated as a company with a CEO and a board of directors. It is owned by the government and under the administrative control of MoFA. The company implements government policy and as such is used as a state instrument to implement government policy. Still, the company is designed to be financially independent and operate on its own budget. Upon its establishment, it was given an initial investment of Gh¢15 million to set up and begin independent operations, although this was only 15 percent of the required investment recommended by the committee that worked on its establishment. The company operates on a marginal profit basis, and is expected to create employment and earn foreign exchange through its operations.

In order to guarantee a minimum price, commodity farm gate prices in the country are determined by the post harvest committee/commission. Farm gate prices take into consideration farmers production cost and then add a 10 percent profit margin. Costs considered include transportation, sacks, drying, bagging, sewing and handling to come up with this margin.

When purchasing commodities, the company uses 75 different private sector licenced buying companies (LBCs) to purchase on its behalf. The company has limited depots across the country but they have no deposit centres and so purchases depend on the agency of LBCs, who buy and aggregate commodity, before transporting it to the company's depots.

The price paid to LBCs again is determined through considering marketing costs including storage and transportation; however, it is pan territorial and pan seasonal. By allowing LBCs to buy commodity, NAFCO makes it possible to buy from many outlying areas, which it cannot reach by itself and also reduces costs of transportation. Contracts with LBCs include parameters on quality, amount to be delivered, delivery time and payment arrangements, which is usually in arrears, while LBCs buy with spot cash, making it possible for farmers to access cash immediately when they sale their commodity.

The company aims to sell commodities throughout the country to final consumers who can either be households or institutions. A minimum of 100 bags is sold and so households that want fewer bags are encouraged to come together and buy as a group.

Since establishment, NAFCO has only been purchasing very little of total marketed commodity output, between three and five percent respectively. NAFCO is, therefore, nowhere near a monopoly in procurement in the markets it is involved in maize, rice and soya beans. Instead private traders called 'market queens' dominate these markets. On average, farmers think that the market price is mostly higher than the minimum guaranteed price (although over 84 percent of farmers indicated not knowing the price set by NAFCO).

There are concerns that analyses on the effectiveness of NAFCO indicate that the positive results expected through the establishment of the system (i.e. higher price stability, reduction in post-harvest losses, lower prices for consumers and higher prices for farmers resulting in increased production) have not been achieved, despite significant investments (FAO, 2015). However, while NAFCO has faced a number of operational

challenges, its interventions have not led to market distortions. In fact, other assessments show a more positive outcome from the companies interventions.

There are preliminary indications that price setting by NAFCO has helped with price stabilisation, as maize price volatility reduced from 48 percent between 2002 and 2008 to 31 percent between 2009 and 2012 (ISSER, 2015). Angelucci and Pierre (2014) conducted regression analysis to assess the impact of NAFCO interventions on maize prices and food security. Using monthly prices from six wholesale markets between 2002 and 2013, they found that NAFCO marginally helped to reduce maize price increases and volatility after 2009 in areas where the company participated in the market. Maize prices in NAFCO markets were 0.05 percent lower than the rest of the markets (statistically significant at 0.01). Findings show that on average maize prices increased by 16 percent after 2009, but the increase was lower in areas with NAFCO operations. Therefore, even with the small market share that the company commands, it has positively impacted output markets while allowing the private sector to take the lead.

NAFCO has faced substantial operational challenges due to inadequate financing and storage facilities. As noted the company only received 15 percent of the recommended financing for its establishment. This has resulted in the company having poor storage facilities, and therefore lacking the ability to mop up all excess supply as per the company's objective. LBCs have complained of inability of NAFCO to off-take greed amount of stocks, late payments and poor communication. Further, there is no process to ensure that the minimum farm gate prices in remote areas is enforced, especially given the lack of information on NAFCO interventions by farmers.

However, GoG is determined to ensure that the company runs as a commercial entity while it achieves its social objectives. Given the challenges that NAFCO is facing, government has clearly pointed out its intention to engage private sector players in Public Private Partnerships (PPPs) so as to improve storage and the capacity of the company to distribute and export the surplus production it purchases. There has been no fiscal injection of government into the company or excessive government involvement apart from the initial investment made.

In this way, instead of alienating commercial and private sector players, the government is encouraging private sector participation and growth. There are some concerns that the company's operations may grow to an extent where it can lead to market distortions. As it stands however, NAFCO is having direct positive impacts on both food security and price stabilisation without imposing a heavy fiscal burden, and indirect impacts by allowing investments in other productivity enhancing programmes like mechanisation.

There are a number of lessons that FRA can learn from NAFCO. Key among them is the need to restrict fiscal funding to the agency, which will, in turn, restrict the amount of commodity that FRA purchases. By restricting the budget that goes to FRA, government will not only reduce its fiscal burden, it will also reduce the crowding out effect on private sector players. Instead, the government can attain its welfare goals by giving out Social Cash Transfers (SCTs) which have been found to have strong impacts on consumption, material wellbeing and productive investment among recipient households in the country (Handa et al., 2015).

Tanzania's Warehouse Receipt System

Warehouse receipt systems (WRS) are a good market policy for reducing commodity price volatility. Warehouse receipts are certificates, issued by warehouse operators to depositors, which provide proof of ownership on a certain commodity deposited in a particular warehouse. WRS facilitate private storage and provides receipts in exchange of stored commodities. This system protects farmers against price variability as it gives them an option to store their produce and sell during favourable price periods. WRS can be transferable in which case they can be sold openly, or they can be non transferable and therefore used as collateral, a guarantee to show that the farmer is holding stock of a particular commodity with information on grade, quality and value.

Tanzania has been implementing WRS since 2005. Tanzania started receiving technical assistance on WRS in 1999. Between 2002 and 2005, WRS financing projects were piloted in the country but there was no legal framework to support activities and so financial institutions were hesitant to support the model. In 2005, the Warehouse Receipt Act was passed by the Parliament and the Tanzania Warehouse Receipt Licencing Board (TWLB) was established. In 2006, operational guidelines were released and a few financial institutions started accepting receipts issued by warehouse operators as documents of title (Pascal, 2012). Tanzania has the most developed WRS in Africa.

There are seven crops under the scheme – coffee, cashew, maize, paddy, sunflower, sesame and pigeon peas. However, the system has worked well in cash crops than in grain markets due to government interference and lack of transparency in the later. Even in export markets, the coffee auction is more organised compared to the cashew auction. To function efficiently, WRSs depend on access to storage facilities, credit, markets and market information.² As such, the Rural Financial Services Programme in Tanzania supports the creation of Savings and Credit Cooperatives (SACCOs) by local communities located in areas with warehouses to facilitate credit applications to financial institutions.

Farmers, traders and companies can all participate in the WRS, and access bank loans of up to 50 percent to 80 percent of the value of the commodity they deposit. The WRS have been shown to double farmer incomes among participating households. In 2012, NMB, one of the financial institutions (bank) participating in WRS had a total portfolio of US\$15mn with more than 351 farmer groups and companies financed, and less than 6 percent non-performing loans. The WRS portfolio also represented 40 percent of their total agriculture related credit disbursed.

The WSR operates as follows; the farmer, trader, group or company delivers the commodity to the approved warehouse and is issued with two receipts. The depositor then takes the receipt to the financial institution for loan disbursement. The loan disbursed is usually between 50 and 80 percent of the value of the commodity. The depositor then negotiates with buyers on a price and once a price is agreed upon, they make a payment into the bank account of the financial institution, which financed the depositor. The financial institution issues a release warrant for the buyer to access the

² <http://www.ruralpovertyportal.org/country/voice/tags/tanzania/warehouse>

commodities from the controlled warehouse, and the warehouse operator releases the commodity as per release warrant to buyer. There are plans to make the process electronic the recent future.

The key success factors in this programme have been: i) suitable storage infrastructure with appropriate legislation guiding the operations of warehouses through the TWLB; ii) buy in by financial institutions who have a large network to reach rural farmers and ability to provide adequate monitoring and supervision; and iii) the organisation of the market through grades, quality and standards that increase efficiency in trading.

Key challenges in the system have been as a result of political interference in the markets, especially in grain markets. There is still a lack of awareness among smallholder farmers on how WRS work, while some areas implementing WRS have poor storage facilities. Markets that were performing the worst on WRS showed very low levels of knowledge among farmers. Further it was noted that auctions in cashew exports were conducted through closed tender bids while in coffee, bidding was through open auctions. This was causing a lot of complaints and suspicion among producers and traders as to how the tender committee was awarding successful bids. Finally, the cost of setting up and running a warehouse was prohibitive in some rural areas.

WRS help cut transaction costs arising from moving commodity before the transaction occurs, they provide collateral that farmers can use to borrow, and they also provide market information. For a WRS to work, they require infrastructure, a supportive policy environment that is not ad hoc and unpredictable, a developed financial market and a stable legal environment to enforce contracts. Clear guidelines and definitions of commodity standards, quality and quantity must be implemented to resolve information uncertainties. This helps to remove transaction costs that arise from lack of grades and standards, especially to big buyers.

The key lesson for the Zambian government from Tanzania's experience with the WRS is that Government needs to support the operationalisation of ZAMACE not only through adequate legislation, but also through incentives aimed to encourage private sector infrastructure development so that rural smallholder farmers also benefit from the system.

Kenya's Use of a Price Band

Kenya's national strategic grain reserve, National Cereals and Produce Board (NCPB), has been using a price band to determine when to enter the market to buy produce and when to offload produce to the market. The NCPB is a state corporation which aims to 'cushion farmers from the effect of over-supply in periods of good weather and to provide a first line of defence for coping with food deficits'. The board is mandated to maintain maize stocks of 8 million bags with half of this being cash form while the other half is actual 90 kg bags. According to the government:

'The mix of grain and cash ensures that on the one hand the government is able to save lives in the case of an emergency by mobilising food to areas not well served by grain markets. On the other hand, cash reserves allow the government to purchase commodities in areas with well-functioning markets when an emergency occurs.'

Initially, NCPB was holding four million bags of stock. However, after the food crisis of 2008, the government of Kenya revisited the policy and increased the physical stocks that NCPB was supposed to hold to eight million bags. There are reports that this change has not been well implemented.

While grain markets are fairly liberalised, the NCPB still plays both commercial and social roles. The NCPB deals with various products and offers related services to its clients in competition with private players in the industry. Besides trading in key grain products such as maize, wheat, beans, rice, millet and sorghum, the Board offers additional services, such as grading, fumigation, cleaning and warehousing.

The NCPB uses price bands as a way of stabilising prices in the face of the classical “food price dilemma” whereby when prices are too high, they hurt urban consumers or net buyers of the staple and when they are too low they hurt farmers/producers or net sellers. The idea behind the price band approach is to raise the prices when they are low and to lower the prices when they are too high by offloading cheap stock on the market. NCPB, through this mechanism has been able to partially stabilise the prices but inadvertently, raised the prices of maize above market level.

For example, Demombyness and Kiringai (2011) say that in recent years, operations of the NCPB have raised the price of maize by fixing a price floor well above market levels, with the result that Kenya’s maize prices are among the highest in Africa. Jayne et al. (2008) show that maize prices may have been stabilised by NCPB between 1989 and 2004 but not in the years that followed after, while in Zambia the Food Reserve Agency may have managed to stabilise prices between 1996 and 2008 but with less impact thereafter (Mason and Myers, 2013).

Noteworthy, there are important considerations that must be made when deciding on what price band to use when aiming to stabilise commodity prices. A wide band implies that there is less intervention. A wide band also means that there is less stabilisation as the price is allowed to be more volatile. But on the plus side, this means the cost on government side is low and it gives the private sector more room within which to manoeuvre. A narrow price band does the opposite. A constrictive price band, allowing less fluctuation than seasonal storage costs, would displace private trading activities. Tight bands may entail government annual purchases during the harvest season when prices are lower, and sales during the off-season when prices are higher, reducing both inter-annual and inter seasonal price fluctuation (Minot, 2010), but generating high running costs and displacing private activities.

A Price band should also consider the market price. Otherwise, when it is set too low, government may overbuy and go over their storage capacity leading to losses. When it is set too high, government may deplete their stock. In both cases, the government would not be able to support prices; this is why an in-depth analysis and monitoring of market prices to support price band decisions is extremely necessary. When protecting producers, the band should take into account the cost of production to allow farmers to be able to buy inputs for the following season but avoid making huge profits to make the band appear like a subsidy.

Other factors to be considered include transportation cost and location of storage facilities. Transportation cost is just as effective as the price band set by government in terms of signalling purchase and selling. Consider this;

The band price set by the government has a floor price of 90 and a ceiling price of 110; transportation costs from market A to a depot are 10. Producers would not bring their crops to the depot until the market price falls below 80 ($90-10=80$); on the other hand, traders would not move crops from the depot to market A until market prices are 120 ($110+10=120$). The effective price band is thus 80 and 120.

Problems still exist though. Evidence from national and international experiences suggests that buffer stocks have been more effective in moderating downward price movements than price increases. In the latter case, buffer stocks can be released up to their depletion; beyond this point there are no means to limit price surges (AMIS, 2011). Other alternatives could be use buffer stock to only protect the producers from low prices while urban consumers and other could be taken care of by other social safety nets like cash transfers in times of price.

When compared to South Africa, which is the international reference price for Eastern and Southern Africa, maize price volatility in both Kenya and Zambia between 2005 and 2011 was higher than in South Africa. This is on the backdrop that South Africa does not have buffer stocks to use for influencing prices. In particular, the World Bank (2012) estimates that price volatility in South Africa was only at 5 percent while in Kenya and Zambia it was at 12 percent and 14 percent respectively, even with buffer stocks to stabilise prices.

A key lesson from Kenya's experience with the price band is that FRA can use a price band in maize marketing to signal to the private sector when they should expect the agency to buy commodity in excess of the strategic grain reserve, or to offload commodity on the market. This will make government interventions more predictable and allow the private sector to make strategic decisions on maize marketing.

Tanzania and Rwanda's Strategic Grain Reserves

Following the 2008 food prices crisis, most country governments intervened in staple crop markets. For example countries like Ethiopia, Kenya, Senegal, and Zambia attempted to procure grains from abroad. Kenya and Zambia looked to South Africa and Senegal signed a five-year contract to import Indian rice. Ethiopia's 2007 and 2008 wheat imports came from multiple sources, especially Romania, Bulgaria, Ukraine, the United States (US), and Italy (Admassie, 2013). Other countries like Tanzania responded by observing the markets than trying to solve the problem through intervention.

The Tanzanian strategic grain reserve purchases negligible amounts of maize grain compared to what is produced and marketed to have any influence on the market (about one percent of total production). Its role has been to help rural farmers by focusing on remote areas, as such, it has been observed to support producer prices and increases market competition in remote areas in the country (Morrison and Sarris, 2010). Rwanda is another country that holds strategic reserves for maize and beans. However, the strategic reserve in Rwanda is relatively new as it was recently established and there

aren't literature understanding its impact on the market.

Having food reserves makes sense for most countries, although there is a debate on whether they should have actual grain stock or just reserves in monetary form. Food reserves are an ancient idea, responding to inherent characteristics of agriculture, particularly the presence of relatively constant, inelastic demand coupled with a much more variable short-term supply. In principle, a small and well-managed stock could provide "degrees of freedom" in responding to crises, allowing quick sales or emergency distribution as needed until commercial imports and food aid can arrive (Tschirley et al, 2006). Unregulated agricultural markets tend to produce a pattern of many years of declining prices interrupted by short, sharp upward spikes. Those price spikes cause a lot of distress to poor consumers, and only help farmers with a crop to sell when prices are high.

Literature on the impact on the market of a government strictly buying only for strategic reserves is quite limited because most of the regional governments engage in buffer stocks at one point or another. However, in Tanzania, in spite of the absence of an effective grain stabilization policy, and the government only buying very little of total output, the variability in maize prices is relatively low. The coefficient of variation in monthly maize prices in Dar es Salaam is 26 percent, the lowest among most countries in the region (Minot, 2010). This price stability may also be related to the importance of cassava as a potential substitute staple.

As another option, regional reserves could be of major importance in helping to balance the regional food demands. Regional reserves could provide several advantages, by reducing the costs of purely national reserves, enhancing price stability in the region because of the wider geographical coverage of the reserves and reducing national political interference in their use, as the administration of regional reserves would require open borders. However, there are major barriers to establishing regional reserves. The most significant one is that they require a degree of political coordination to which most individual states are not generally willing to commit. However, there are no regional food reserves operating in Africa, despite several attempts to do so, although in West Africa, the ECOWAS has begun to establish a regional emergency food reserve. Instead, there are impromptu export bans on maize across the region when neighbouring countries demand is high enough to raise the price to levels higher than a country's domestic price.

Recommendations

Harmonise Maize Market Policy Environment

There is need for greater transparency in the way policy decisions are made in maize markets. The government needs to engage all stakeholders, including ZNFU, MAZ, ZAMACE and GTAZ openly and consistently before decisions are made on marketing and trade policy, and such engagement should be institutionalised. Decisions should not be political, but must be aimed at sustainable long-term agricultural growth. Government needs to develop a well-defined food security strategy (with clear roles for domestic production, reserves and trade) and desist from ad hoc, discretionary unpredictable policy decisions that have been observed in the past. Unpredictable trade policy has hurt the country's ability to become a regional supplier, and has greatly contributed to low private sector participation and investment. There have been calls by various stakeholders to effect the Agriculture Marketing Bill as this would help in attaining policy coherency in the sector.

Restrict FRA Purchases

In 2005, the FRA mandate was expanded beyond keeping strategic grain reserves to include a marketing function, which has led to it becoming the single most dominant player in maize markets. Evidence shows that, while there have been some positive outcomes, overall, interventions have hurt the maize markets, and may have actually exacerbated the instability of food prices (Jayne et al, 2010). In addition, FRA activities put a huge fiscal burden on the government. Therefore, FRA purchases must be restricted possibly to strategic reserves only and these must be obtained from pre determined outlying areas.

Regarding what quantity of grain constitutes a strategic reserve, there is need to continually evaluate and update this quantity, possibly on an annual or bi annual basis. This is because Zambia is better positioned to deal with supply deficits than it was in 1996 and 2005 when the FRA mandate was extended. The land under maize cultivation has more than doubled, and so has the area under irrigation. This has increased the countries resilience to droughts, and improved the nations ability to respond to supply shocks. Further, there are various food security monitoring mechanisms in place in the country to inform government of the need to put in place measures against any expected supply shocks. Therefore, considerations of annual agricultural performance and expected performance in the following year need to be factored in when determining how much government should store as a strategic reserve for any particular year.

Questions surrounding how to determine the actual quantity remain open for discussion. Learning from other countries like Rwanda, it can be based on feeding 25 percent of the population for six months. This period is considered adequate for a country to overcome red-tape and manage to import grain from other countries, or indeed put in place other measures to counter the deficit. For this strategy to work well, early warning systems and disaster prediction information is required. Such a strategy would allow the agency not to accumulate too much grain and cut on storage costs and grain losses.

In times of crisis, government intervention still has destabilising effects on the market. For example, prices in Mozambique where the private sector was allowed to import maize without the interference of government during the food crisis of 2002-03 remained stable compared to Malawi and Zambia where government was involved in importation of the grain (Tschirley et al, 2006). It is urged, therefore that governments time and money are better spent on continued improvements to market information and early warning systems, on improved infrastructure for domestic food marketing, on more transparent policy toward external trade, and on market facilitating mechanisms that can be deployed during a crisis.

As observed from both Tanzania and Ghana, it is possible to effect grain price stability even if public stocks account for only a small percentage of total production. If the private sector; traders, millers and commercial farmers are allowed to participate competitively in the market, in the long-term, price stabilisation will be achieved and be sustained. For example, if FRA is purchasing stock to cover 6 months of national demand, private actors would be aware of this quantity and calculate how much of the marketed surplus remains for them specifically.

Further, FRA operations need to be commercially oriented and better targeted to achieve food security at household level. In order to achieve welfare objectives, FRA should aim to sell grain to informal millers and households instead of selling to commercial millers in urban areas. Commercial millers must instead be left to compete on the market.

Use a Price Band

If the FRA remains a major market player, then it should use a price band to determine when to buy and sell in its efforts to stabilise prices. This way, private actors can anticipate when government is likely to get involved in the market. Through a price band, government should set both a price ceiling and a floor price that can indicate when they are likely to buy and sell in the market, and this should be in line with regional grain prices. When the price is too low and considered to be disadvantaging the smallholder farmers (based on cost of production estimates), government can enter the market and begin to buy at a higher than market price to raise the price of maize. In years when the price is too high, e.g. in a drought year, government should stabilise the price and hence protect the urban consumers by entering the market and selling stocks to dampen the price.

The goal in this case for government is to keep the price between the ceiling and floor prices. This protects consumers against high prices and producers against lower prices. While lower prices can be easy to determine, i.e. not below the average cost of production, higher prices for consumers are more socially determined. If a good share of the population is negatively exposed and cannot afford to purchase food, then prices could be said to be too high.

In terms of how wide the band should be, i.e. what ceiling and floor price should be set, we recommend a committee be constituted that would include various stakeholders including The Ministry of Agriculture, the Zambia National Farmers Union, the Millers Association of Zambia and members of the Grain Traders Association. This committee would work together every marketing season to

determine the band based on agriculture performance, production costs and transaction costs for the season. The band would also be aimed at reducing the marketing margins in the value chain as it has been shown that in isolated and not well-integrated markets, marketing margins are too wide.

Comfort and Sarris (2009) argue that the key to maize sector development is to reduce marketing margins along the value chain. Therefore, a tight band would help reduce margins as well as provide predictability of government actions. By setting a price band, private sector players including traders and millers will be able to plan their purchases, and allow excess produce to be exported. Further, this committee would also be utilised in setting national trade policy objectives, such that expected grain exports each year could be decided through consultations with all stakeholders on available maize surpluses. As a result, transparency in the sector will be attained.

Support Warehouse Receipt System

Zambia has had a negative experience running WRS with the demise of the Zambia Agricultural Commodities Agencies Ltd. (ZACA). The failure of ZACA, which stopped operations in 2006 resulted mostly from i) management difficulties coming from heavy government intervention in input markets, and increasingly output markets, dampening incentives for private storage, ii) non participation of financial institutions due to unsupportive legislation and iii) non participation by key producer stakeholders, large traders found it unprofitable while smallholders failed to participate as they did not have the volumes required by ZACA (Antonaci et al, 2015).

However, the policy environment has changed since then. In 2010, the Agriculture Credits Act was passed, providing the legal framework required for a WRS to function effectively. The ZAMACE has been working on operationalising a WRS for the country. Further, financial institutions have opened up to agriculture credit, showing more willingness by financial players to participate in initiatives taking place in the sector. For a WRS to work efficiently, government support can be directed at incentivising the private sector to put up infrastructure required to run the system.

Instead of spending money on purchasing large amounts of maize, the government can channel funds to the development of infrastructure required for storage through targeted innovative funding of private sector initiatives, which will also lead to growth in other markets like soya beans. The aim is to increase private sector capacity for storage so that they bear the costs and losses associated with storage, while ensuring that such investments are done in a way as to benefit rural smallholder farmers as well. Finally, the government should aim to buy the strategic reserve through the WRS in the long run. This will provide the volumes required for the WRS to work well on one hand, and FRA can purchase substantial amounts of grain without having unintended distortionary effects on the market.

Conclusion

In conclusion, there are no clear and perfect regional cases from which to draw examples but from each of the countries we have cited, there are positive aspects of how the programmes are operating and we can therefore draw some lessons. There are challenges in managing staple foods. The political nature of these crops are such that supply is considered a basic right and governments stake their election and re-election on the availability of these commodities. However, FRA has more than one option it can take to reduce the fiscal burden of its interventions, be more predictable and allow the private sector to take an active role in maize markets.

The most feasible and demanding less institutional change, is adopting a price band mechanism to determine when it enters the market to purchase and sell stock. This approach makes the intervention from government more targeted and allows the private sector to predict the intervention times as long as the floor and ceiling prices are set in a consultative and transparent manner. This can be adopted as a short-term measure. The warehouse receipt system is another option that can greatly benefit all market players. However, this option requires significant investment in setting up storage infrastructure across the country so that everyone can participate. This can be adopted as a long-term measure, and can be implemented in a phased manner.

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