

# Zambia Food Reserve Agency Pricing Mechanisms and the Impact on Maize Markets



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# Contents

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<i>Acronyms</i> .....	1
<i>Executive Summary</i> .....	2
<b>1. Introduction</b> .....	<b>3</b>
<b>2. Study Aims and Objectives</b> .....	<b>5</b>
Why is this Important?.....	5
<b>3. Food Reserve Agency Pricing Mechanisms</b> .....	<b>6</b>
Floor Price Rationale .....	6
Price Determination (factors likely to be influencing price).....	8
Floor Price Market Effects .....	12
<i>On the Market</i> .....	12
<i>On Producers (farmers)</i> .....	13
<i>On Millers</i> .....	14
<b>4. Regional Experience</b> .....	<b>16</b>
<b>5. Conclusion and Recommendations</b> .....	<b>18</b>
Conclusion.....	18
Key Recommendations .....	19
<b>References</b> .....	<b>22</b>

## *List of Tables*

Table 1: Correlation between price and other variables.....	9
Table 2: Results for regression of purchase price on ‘political’ and expected sales .....	10
Table 3: Results-regression of quantity purchased on political and expected sales .....	11
Table 4: Elections years and expected sales influence on price paid by FRA.....	11
Table 5: Influence of political years and expected years on quantity purchased .....	12

## Acronyms

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CSO:	Central Statistical Office
CFS:	Crop Forecast Survey
FISP:	Farm Input Subsidy Programme
FRA:	Food Reserve Agency
IAPRI:	Indaba Agricultural Policy Research Institute
IISER:	Institute of Statistical, Social and Economic Research
KNCPB:	Kenya's National Cereals and Purchasing Board
MAZ:	Millers Association of Zambia
MoA:	Ministry of Agriculture
NAMBOARD:	National Marketing Board
NAFCO:	Ghana's National Buffer Stock Company
NCPB:	National Cereals and Produce Board
SADC:	Southern African Development Community
ZCF:	Zambia Cooperative Federation



## Executive Summary

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This paper investigates, and provides an understanding of Food Reserve Agency (FRA)'s pricing mechanisms in the maize markets in Zambia by assessing: (i) FRA's rationale for setting a maize floor price; (ii) the price determination process and (iii) the floor price effect in maize markets in the country.

Analysis shows that setting a floor price in maize markets is based on welfare and political concerns, and is aimed at providing adequate production incentives and stabilising maize prices for farmers. The paper hypothesises three major factors to influence price determination by the FRA in particular years before, during and after elections and expected sales. The paper found that a one percent increase in expected sales leads to a 0.5 percentage increase in FRA price and a 1.7 percentage increase in quantities purchased.

Further, FRA buys about 1.5 times more maize in an election year than in other years. The paper also found that while FRA's interventions have been based on welfare concerns, they are regressive and harm a large proportion of rural households (who are net buyers of maize in Zambia). Finally, it is revealed that FRA maize floor pricing activities have crowded out key private sector players in the maize markets, thereby reducing options (choice) available for farmers to sell their produce.

## Introduction

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In Zambia and many other African countries, there has been resurgence in direct government participation in agricultural input and output marketing. Government participation in output marketing has generated a lot of debate on the impact it has on private sector involvement and (additional) costs from the government coffers. In Zambia, the state agency involved in agriculture marketing, the Food Reserve Agency (FRA), has been active since 1996.

Zambia has a long history of marketing agencies. A maize control board – National Marketing Board (NAMBOARD) – was established in 1936 and given power to purchase and sell all maize at fixed prices along the railway line. Over the years, the functions of the government purchasing maize grain, enabled by different pieces of legislations, have evolved from buying along the line of rail and 40 kilometres radius, to not buying at all between 1991 and 1995. NAMBOARD set a pan-territorial and pan-seasonal maize producer price and was the government agency involved in maize markets before liberalisation in the 1990s. NAMBOARD also handled the imports and exports on behalf of government. During this period, private trade between districts was not allowed.

The goal of government then was to promote the welfare of the smallholder farmers by giving incentives to them as producers, through both inputs and output markets. This goal was achieved with great success in the 1970s and 1980s (Howard and Mungoma, 1996). During this period, maize production increased heavily and it was not only because of government involvement, but other factors like availability of improved seeds in the market. The government felt that it had a mandate to provide a market for farmers to encourage them to produce more – an idea still held today. Even after economic liberalisation in Zambia, there was still very little trust in the private sector by the government.

NAMBOARD was mismanaged and faced heavy deficits. Mismanagement arose from within the board, and also from the subsidies that it had to implement for pan-territorial pricing. The purchase price from the remote areas was well below the economic cost of buying maize from there. Maize output marketing was transferred to the Zambia Cooperative Federation (ZCF). ZCF is the umbrella body of farmer cooperatives in Zambia, and receives funding from the state and donors. From the period 1991 to 1994, during the early years of reform, government was not involved in maize output markets.

In 1995 the FRA Act was passed by the Parliament, and became operational in 1996. The initial mandate of the agency was only to buy ‘strategic commodity reserves’ for use as relief in times of famine and any other supply shocks. In 2005, the Act was amended. FRA was given the authority to get involved in crop

marketing – making it a grain marketing board.<sup>1</sup> Since then, the agency has been heavily involved in the output market unabatedly, and purchased an increasingly bigger proportion of the marketed surplus from farmers. Except in the years 1998-2001 that the agency did not purchase any commodity, FRA has bought maize, rice and cassava in the crop markets since 1996. In 2011, FRA made record high purchases of close to 900,000 MT of maize, which represented 83 percent of the marketed surplus from smallholder farmers. The cost of this FRA maize purchase exercise was estimated at K1.5 trillion, approximately nine percent of the GRZ national budget for 2010 (K16.7 trillion) (Nkonde et al., 2011).

The 2014-2015 season – even without official statistics<sup>2</sup> – has seen FRA scale down both in terms of purchasing involvement and major policy signals in the maize markets. The indicative maize price (otherwise commonly referred to as floor price) was announced late, and government did not indicate at the time of announcement whether they would buy maize or not. As government did not give clear signals, they used this window to encourage farmers to sell to private traders and not depend on FRA. By the time FRA entered the market after the price was announced, a good share was already sold to private traders. While FRA was buying maize at K75 per 50Kg bag, the private sector was buying at between K75 and K100 per 50Kg depending on the location.

It is, therefore, clear that the presence of larger number of buyers of maize in the market (including private firms) had a positive effect *vis-à-vis* price realisation for small farmers.

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<sup>1</sup> A grain marketing board is a state-controlled or state-sanctioned entity established to direct the market and marketing of specific commodities within a given country or other geographic area while a 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)

<sup>2</sup> For example, FRA went late into the market allowing private traders the market to set price and also FRA targeted only 800 MT, a relatively small portion of the marketed surplus



## Study Aims and Objectives

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The main objective of this study is to investigate, and provide an understanding of FRA's pricing mechanisms in the maize market. Particularly, the paper aims to critically assess and provide insight into the following:

- (i) FRA's rationale for setting a maize floor price
- (ii) The price determination process
- (iii) The floor price effect in maize markets and on key market participants

Finally, the paper will give recommendations on best practices based on study findings.

### **Why is this Important?**

As highlighted, FRA is the largest single buyer and seller of maize, a commodity almost entirely produced by smallholder farmers in Zambia. Understanding FRA's pricing mechanism and the impact this has had on maize markets is therefore absolutely vital for ensuring smallholder agriculture development and diversification.

As has been noticed in the 2014-2015 season, optimising FRA's role in the output market not only provides greater scope for participation of private players in the market, it also helps farmers get a good price for their produce. The analysis of FRA's pricing mechanism would help identify factors for FRA to optimise its role in the output market, without compromising its role of ensuring benefits for small farmers.

Maize is Zambia's staple food, and approximately 80 percent of all smallholder farmers in the country grow it. The grain accounts for more than 60 percent of all calories consumed (Govereh et al, 2008). In the rural areas, farming is the main economic activity for most households, and their only source of income in most cases. However, rural poverty has remained stubbornly high at 79 percent, with those cultivating less than 5ha being the worst affected (LCMS, 2010).

Reducing poverty levels and improving the economic situation of these households therefore requires that agriculture markets, especially maize markets, work efficiently and competitively.

Further, FRA operations not only impact smallholder farmers but also affect other key players in the sector, including commercial farmers, millers and traders, who are important for the efficient functioning of the market.

# Food Reserve Agency Pricing Mechanism

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## Floor Price Rationale

According to the FRA website,<sup>3</sup> *'the FRA was created to administer strategic food reserves, and engage in market facilitation, development and management of national storage facilities.'* It maintains a sustainable national strategic food reserve and provides market access to smallholder farmers based in rural areas, especially those in remote locations.

The national strategic food reserve is necessary to ensure reliable supply, meeting local shortfalls in supply and meeting such other food emergencies of key agricultural commodities caused by droughts, floods or other natural disasters. The FRA further addresses other issues affecting food reserves and stabilisation of prices for key food commodities.

When the FRA act was adopted in 1996, the original mandate of the institution was to secure strategic food reserves and stabilise maize prices. *This was based solely on welfare concerns of establishing food security.* During the mid-1990's, Zambia experienced high variability in maize production, resulting in high price volatility in the market. At this time, the private sector was in the initial stages of establishing itself after market liberalisation. In order to reduce the risk of hunger, create a buffer, and allow private market players to organise themselves, FRA was tasked with securing strategic reserves for the country (Govereh et al, 2008).

However, in 2005, FRA's mandate was extended to include a marketing function in maize markets. *Welfare concerns stemming not just from price volatility, but low average price levels of maize, prompted government to intervene in the market.* The government felt that there was need to intervene and increase the average price level of maize. The bulk of maize production in the country is by smallholder farmers. Maize is also their main source of income in most instances. Zambian smallholder maize productivity is relatively uncompetitive compared with both regional and international maize producers (Kuteya et al, 2014; Chapota, 2015).

Therefore, left to market forces, average maize price levels in the country could get very low and would be unable to support production. To prevent price levels falling too low, the government felt it was necessary to intervene through FRA purchases, with the specific intention of raising average price levels, and benefit farmers (especially smallholders). So, in addition to setting the 'base price' FRA has been intervening in the market also as a dominant player (buyer) by buying

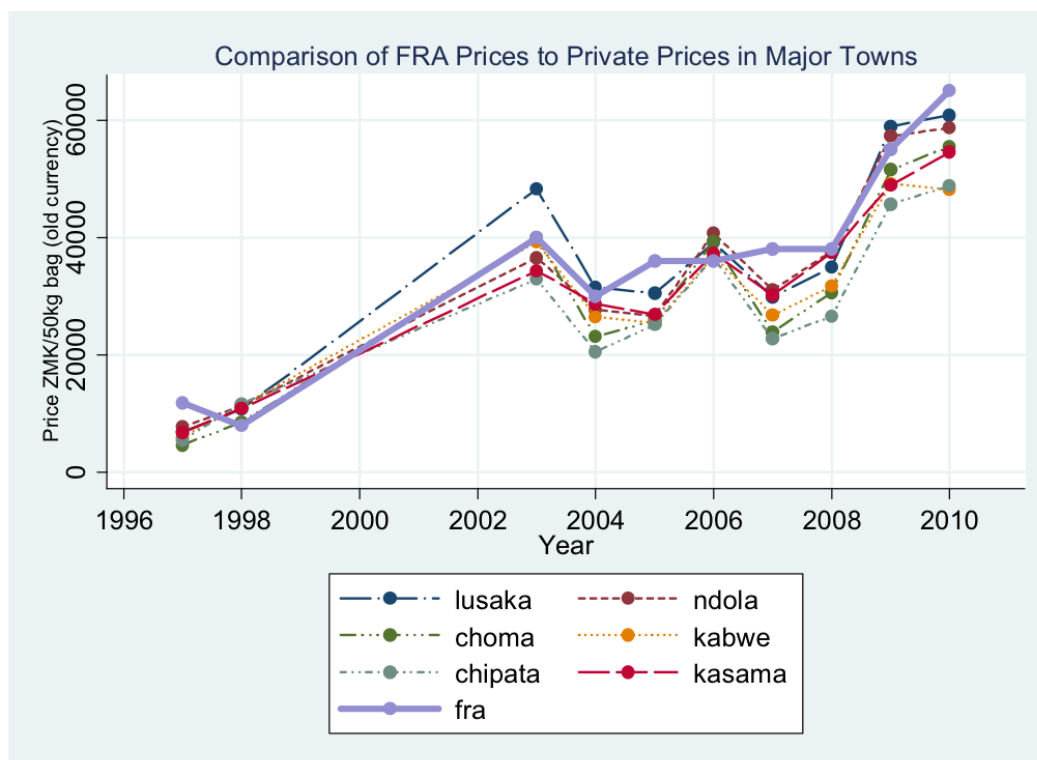
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<sup>3</sup> <http://fra.org.zm/about-us/>

a major share of the maize produced to ensure that farmer get the right price for their produce.

Government’s rationale to intervene in the maize market through FRA is thus aimed at primarily addressing welfare concerns. Given that maize is a staple food, and is produced by smallholder farmers, the government wants to ensure that food security in the country is established, maize prices are stabilised and the average maize price levels are high enough to support small-scale production. To this effect, FRA has been setting a pan-territorial floor price to purchase maize from smallholder farmers. ***FRA’s activities between 2003 and 2008 have raised mean maize market prices by 19 percent, and reduced price volatility (covariance) by 36 percent*** (Mason et al, 2011). Nationally, FRA prices are *always* above the private sector prices while at district level they have *mostly* been above private sector prices.

**Figure 1: Maize Price Trends in Selected Towns**



Source: Data adapted from Mason et al, 2011)

Additionally, there is a general perception that FRA pricing is *politically* motivated. ***Given that the bulk of the population (over 80 percent) is engaged in maize production, ensuring that maize is bought at a reasonably high price is bound to lead to political gains for the Government in Office.*** This has been the case with the FRA. It has been observed that the nominal floor price set and the amount of maize purchased by FRA between 2003 and 2014 have always spiked during an election year (Kuteya et al, 2014).

## Price Determination (factors likely to be influencing price)

In this section, both a review of literature and analysis of data has been combined to understand some of the factors that influence the purchase price by the FRA.

Theoretically, it has been hypothesised that there are three major factors (political, purchase price and quantity) that influence the price at which FRA purchases grain in a particular year. The decision to maintain the same price for a number of years could equally be influenced by hypothesised factors or a non-change in any of the factors. Therefore, these factors and changes are empirically and systematically analysed in the FRA price to find any existing relationship.

The first expected variable, *apriori*, to influence the purchase price of maize is **production** and the consequential **surplus**. This influences the amount that FRA realistically plans and/or eventually buys. Zambia's national maize consumption from the food balance sheet has moved up steadily from about 1.2 million tonnes in the middle 2000s to about 2.7 million tonnes in 2015. With production that has been consistently rising from about 2006, there has always been a surplus of above 400,000 million tonnes in the market. This surplus is what FRA targets to buy, all of it or a share of it, depending on the balance of their **reserves**. This coupled with the **budget** they have been allocated should ideally determine the price at which they buy. What FRA is planning to buy, for strategic reserve reasons, should be influenced by the **carry-over stock**. A high carry-over should mean FRA buying less.

The other variables we include in our analysis are **political** in nature. The goal of FRA is to "secure national food reserves and take wealth to rural Zambia". This is reflected from past engagements between the government and farmers. In the post-independence era, government felt it had a social contract with farmers to provide a market.

It can be argued this also ensured that the client-patron relationship between the government and the smallholder continued. FRA activities are elevated during election years and through this, it is argued elections can even be won. This government involvement in the market is not limited to FRA. There is also a strong correlation between Farm Input Subsidy Programme (FISP) and election outcomes.

Table 1 presents correlation results between FRA purchases and hypothesised variables. We find a significant but weak positive correlation with only a few variables.

**Table 1: Correlation Results of FRA Price with Expected Sales, Production and Quantity Purchased**

Variable	Expected	Production	Price	Quantity
Expected Sales	1.00			
Production	0.98**	1.00		
Price	0.79**	0.74**	1.00	
Quantity	0.72**	0.92**	0.69	1.00

*Notes: Data adapted from Mason et al, 2013; Kuteya and Chapoto 2015. \*\* indicates significance at  $\alpha=0.05$*

From the correlation, it can be seen that the **Price** at which FRA purchases maize is significantly correlated with **Expected Sales** and **Production** in a given year. Expected Sales are collected together with the Production around March by the Ministry of Agriculture (MoA) and the Central Statistical Office (CSO) through the Crop Forecast Survey (CFS).

However, the **Quantity** that is ultimately purchased by FRA seems to have a comparatively weak correlation with the **Price**. This is not surprising given that FRA ends up purchasing more maize than they budget for. This was the case in 2014 where FRA planned to purchase 500 million tonnes of maize, but ended up purchasing slightly above 1 million tonnes (Chapoto, 2014).

According to the Minister of Finance when he delivered an update of the economic situation of the country in mid-2014, these unbudgeted purchases by FRA contributed hugely to the fiscal budget deficit that Zambia witnessed in 2014.

The high and significant positive relationship between **Expected Sales** and **Price**, while good news for the poor rural farmers who sell to FRA, is not good for the overall performance of the market. In real free market situation, **Price** should have a negative correlation with **Supply** given constant **Demand**. However, for this relationship to be positive and significant, it means FRA pricing is antagonistic with the operations of the free market in the maize sector. When FRA buys a huge share of the maize surplus, private players are crowded out from the market.

The FRA's influence in the market can be viewed from two levels. One is that of **price setting**, which others have called 'floor' or 'indicative'. This has an impact on how the private sector engages in the market. If the price is much higher than the market price, the private sector struggles to attract farmers in areas where FRA is buying. The second level is the volume of maize that FRA purchases. In some years the FRA has bought close to all expected maize sales, leaving nothing for the private sector to buy.

*From the point of competition, the dual function of setting prices and buying maize from the market, gives the FRA an undue advantage over the private players and therefore stifles competition.*

***Ideally the price should be set by a Government Committee comprising of government representatives, experts, farmers organisations and private sector, following a scientific and inclusive process.*** This might reduce the occurrence of arbitrary pricing of maize in the country, which would: (i) reduce the revenue pressure on the government; and (ii) help avoid unfair foreclosure of the market for private players.

Table 2 regressed both FRA price and volume purchased on ‘election influence’ and expected sales. ‘Election influence’ has been defined in a qualitative fashion, where it is equal to 1 in a highly political year and 0 otherwise. ‘Election influence’ years include a year before, during and after an election. Election campaigns intensify a year before an election year and reach a peak during the election year. Given that elections have been held around September, by which time the marketing season would already have started and FRA would have started buying maize, it is reasonable to include the actual election year. The year after an election also sees a lot of election influence in policy decisions especially if there is a change of government. This is because the new government wants to come with its own set of policies and assure the public that they made the right choice.

**Table 2: Regression Results of Purchase Price on ‘Election influence’ and ‘Expected Sales’**

Variable	Coefficient	Std. Error	t	P>t
Election influence	0.42	0.26	1.58	0.14
Log of expected sales	0.47	0.16	3.02	0.01
Constant	4.17	2.03	2.05	0.06
R-squared	.59			

*Note: Dependent variable is logarithm of FRA purchase price*

It can be concluded from Table 2, that there is no significant relationship between the ‘election influence’ years and price changes. This entails that government does not always adjust prices in these years. However, there is a positive relationship between FRA’s purchase price and expected sales. The increase in production, and hence expected sales in the last year coincides with an increase in the FRA purchase price. On average, a one percent increase in expected sales leads to a 0.5 percent increase in the purchase price.

Further, it is expected that quantity purchased by FRA to be elastic to both ‘election influence’ and expected sales. On average, a one percent increase in Expected Sales leads to 1.7 percent increase in quantity purchased by FRA (Table 3). In Election influence years, FRA buys about 7 percent more than they buy in non-Election influence years. This elevated level of involvement in election or near-election years is also common with other programmes like FISP (Mason et al, 2011).



**Table 3: Regression Results-of Quantity Purchased on 'Election influence' and Expected Sales**

Variable	Coefficient	Std. Error	t	P>t
Election influence	1.07	.46	2.34	.04
Log of expected sales	1.69	.27	6.29	0.00
Constant	-10.92	3.51	-3.11	.01
R-squared	.82			

*Note: Dependent variable is logarithm of quantity purchased by FRA in metric tonnes*

In order to understand which year (before, during, or after) of an election is the most influential on FRA price and quantity determination, we run further regressions where FRA price and quantity are included as explanatory variables. The results are presented in Table 4.

Table 4 shows a log-log model and linear-linear model. From the log-log model, only expected sales are significant in explaining the price paid by FRA. A percentage increase in expected sales leads to less than a 1 percent increase in the purchase price. However, linear-linear model shows that the year before elections also explains the price paid by FRA. In years before elections, the price increases by about ZMW 19, or is higher by about ZMW 19 compared to other years.

**Table 4: Regression Results of Elections Years and Expected Sales Influence on Price Paid by FRA**

Variable	Coefficient (log-log model)	Coefficient
Year before election	.51 (-.44)	19,595* (-10293.00)
Year of elections	.44 (-.38)	12315.00 (-8859.00)
Year after elections	.33 -.39	10365.00 (-8854.00)
Expected sales from farmers	0.482** (-.18)	0.0283*** (-.01)
Constant	4.01 (-2.28)	17,566** (-6654.00)
R-squared	.55	.75
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1		

In Table 5, the influence of these disaggregated years is also gauged on the quantity purchased by FRA. From the log-log model, it can be seen that in the year of the election, FRA buys about 1.5 times more maize than they buy in other years. From the log-linear model (we had to keep the quantity purchases in log form because of the astronomical figures it is in) we see that all included variables are significant in explaining the quantity purchased. The variables included i.e. political years and expected sales explain about 86 percent of the variation in quantity purchased.\

**Table 5: Influence of ‘political’ years and expected years on quantity purchased**

Variable	Coefficient (log-log model)	Coefficient (log- linear model)
Year before election	.74 (-.71)	1.462* (-.67)
Year of elections	1.509** (-.62)	1.919*** (-.57)
Year after elections	.84 (-.63)	1.385** (-.57)
Expected sales from the farmers	1.731*** (-.29)	2.51e-06*** (-.00)
Constant	-11.39** (-3.73)	9.233*** (-.43)
R-squared	.84	.86

Note: Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**The year of elections sees the most involvement by FRA – the agency purchases about two times more maize than they do in other years.**

Government purchases about 46 and 38 percent more maize in the year before the elections and years after the elections respectively than in other years.

Government prices are mostly above the market price. For our data, in recent times, the only exception when FRA price was lower than the market price is 2006. This is the year that saw reduced production from about 1.2 million tonnes in 2005 to 800,000 million tonnes. Production rose to 1.3 million tonnes in 2007 again. This means that the private players price went up as supply went down- in tandem with the performance of working competitive markets.

**Floor Price Market Effects**

Smallholders grow about 80 percent of the maize produced in Zambia mostly for domestic consumption. Hence, they have been defined as not being strategic players in maize marketing (Abbink et al., 2008). Millers buy maize for maize meal production. Traders and the government are considered key strategic players, as they sell maize to millers. As a key player in the market, any market distortions by government are bound to impact all maize market participants.

***On the Market***

Chapoto and Jayne (2009) in their study on the effect of FRA’s marketing and floor pricing on maize price unpredictability show that FRA purchases appear to have no significant impact on next month’s market prices. While FRA intentions are to provide a floor price for grain trade in markets, it is sometimes the case that market prices exceed FRA buying prices, as in 2006.

In such cases, FRA purchases may not exert upward pressure on maize prices as one might expect. Also, because FRA purchases result in stock accumulation, it is

quite likely that marketing agents take account of the size of the government stock overhanging in the market in their expectations of future prices later in the season.

FRA's pan-territorial and pan-seasonal pricing policy may also have complex and offsetting effects on the direction of near-term future market prices. The bulk of the FRA's maize procurement is soon after harvest, between July and October, when maize prices are relatively low. Typically, prices gradually rise and peak during the hunger period (December through March). FRA's actions influence the incentives for private players to store maize and sell when the price has gone up in the dry (hunger) season. Studies have shown that the impact of floor pricing is a downward pressure on next month's maize prices. Floor pricing generally reduces the magnitude of seasonal price increases and hence has a stabilising effect on market prices.

Millers are most affected from the effects of floor pricing. Due to FRA's tendency to offload maize onto the market at a relatively lower price than the market price, millers are uncertain on how much to procure during the marketing season. This is because when FRA offloads maize, the privately purchased stock becomes more expensive than stock accessed from FRA (given FRA's intention to keep mealie meal prices low, they sell to millers at rates that are lower than the cost at which FRA buys maize). Thus, the difference in maize market and FRA price has been shown to distort the market and crowd out private sector players. In the maize market in Zambia, there are essentially four major players – farmers, millers, traders and the government.

### ***On Producers (Farmers)***

In the early 1990s, reforms which included government withdrawing from both the input and output market saw smallholder farmers shifting from maize production to cash crops. This resulted in low competition in the maize sector as few farmers were growing the crop and the growth of sector slowed down. Government through FRA in 1996 started purchasing maize again to encourage more farmers to grow it. FRA pricing is considered a form of output subsidy to maize growers as it is mostly above market price. This is captured disproportionately by medium and large farmers who are already better off. FRA has also been shown to buy on average about 9 kms from the main road. This leaves the remote poor farmers worse off.

Studies have also shown that that **about half of the Zambian farmers are net buyers of maize**, this means that as much as prices are meant to take 'income to rural Zambia', prices affect the ability of other farmers to buy food. Even the remaining net maize sellers, gains from higher maize market prices are highly concentrated among three to five percent of maize-growing smallholders, who account for 50 percent of all smallholder marketed maize (Kuteya et al. 2011). This group tends to be better off as it has more assets. FRA pricing policy has also resulted in less diversification as it dissuaded farmers from growing other crops.

### ***On Millers***

The Government of Zambia through the Food Reserve Act have since the establishment of FRA in 1995 subsidised maize sold to millers. Therefore, a study (Sitko 2014) indicates that wholesale maize-grain prices have reduced substantially from about K4.00 per kg in 2000 to about K1.00 per kg in 2011. The reduction of wholesale maize price has been due to heavy subsidies that the government has given millers, hoping that subsidies would, in turn, result into lower consumer prices.

These subsidies however, have not translated into lower prices for consumers, but rather into higher margins for millers. The millers, especially through their association, Millers Association of Zambia (MAZ), have been accused of being a cartel and increasing prices at will. The association, has however, maintained that these increases are a result of higher production costs that include the purchase price for maize.

Subsidies to millers have not benefitted small-scale millers located in remote districts and towns. Instead, they have been regressive as small-scale millers already face operating capital cost challenges. Their margins have been further reduced compared to the commercial millers. The subsidies have also not provided any incentives for millers to fully participate in the open market and store grain for later use.

Overall, FRA policies have had diversified effects on market players in maize markets including: less competition in the maize market, uncertainty over prices, big millers having an advantage over the small ones and less overall open market maize supply.

The current 2015 marketing season under the Minister of Agriculture, Given Lubinda, has pledged a change in policy towards allowing the private sector to be fully active in maize markets. Box 1 presents the 2015 case and explains some of the implications on the market and players.

#### **Box 1: FRA Involvement in Maize Market in 2015: A Case Study**

Two major shifts by government – in the right direction – characterise the 2015 marketing season. Firstly, through Given Lubinda, Minister of Agriculture, Government of Zambia delayed announcing the maize floor price. Secondly, government left borders open for the export of maize, unlike in most years when borders are closed. These two policy shifts combined with the fact that other neighbouring countries had a maize deficit which provided a good case study for the effects on the market. Zambia, even though there were fears of a maize deficit, managed to produce a surplus, eclipsing South Africa which is usually the region (SADC)'s biggest maize producer. IAPRI (2015) provides some positive lessons from this 2015 scenario.

Because of the delayed announcement, or non-announcement as government had not indicated they would announce and the Minister maintained that it was the preserve of FRA to announce the maize price. During this period, the Minister

was on record encouraging farmers to sell to private buyers but admonishing them to bargain for better prices. Because of this, the private sector was and is active, buying maize from farmers at competitive prices, ranging between K50-K80 per 50kg dependent on location. This position later changed as FRA announced the price and quantity they wanted to buy. FRA announced a price of K70 per 50kg bag and a targeted quantity of 50,000 metric tonnes but the president overruled and instructed them to buy at a price of K75 and increase the tonnage to 800,000 metric tonnes. This instruction from the president, a year before the elections shows how politicised FRA pricing and purchases are.

Zambia, with the biggest surplus in the region of above 800,000 metric tonnes had/has the opportunity to export maize and earn forex amid the weakening copper prices. Government fears about leaving the borders open has been that this would result in food insecurity as all the maize is exported. However, IAPRI (2015) show that even if the borders remained open, the modalities for exporting maize means that it would take about 8 months to export just the surplus of about 800,000 metric tonnes, by which time the new marketing season would be around the corner. This open border policy allowed Zambia to export significantly higher maize quantities compared to previous years. This also allowed farmers to have more options to which to sell maize to. Mostly, farmers who sold to traders who sold across the border were paid higher prices than those who sold to FRA. For example, by July 2015, about 200,000 metric tonnes had been exported. Open borders also ensured that the deficit in other countries benefited the Zambia farmers as the exporting traders were paying a significantly higher price at about K98 per 50kg bag. This allowed farmers to benefit without a burden on the treasury. However, millers complained that this would increase the price of mealie-meal as it would raise their production cost buying maize at a higher price competing with exporters and urged government to ban the export of maize<sup>4</sup>.

In conclusion, these policy shifts have been commended by many players including the Grain Traders Association of Zambia which represents private buyers of grain. "To some extent, what happened during the first quarter of the maize marketing season has demonstrated that when the market is allowed to work, private sector competition results in farmers getting a good price for their maize, and importantly they are paid at the point of sale, unlike with FRA" notes IAPRI in its market outlook paper. It further goes on to state that the private sector has benefited from a clear, transparent, and consistent message from the Minister of Agriculture on exports, price and quantity to be bought. This consistency from the minister in the early stages of the marketing season has been that of creating a conducive environment that would make Zambia a sustainable food bread basket for east and southern Africa. "The Grain Traders Association of Zambia (GTAZ) indicated that if this policy is sustained, it will hasten the setting up of the commodity exchange in Zambia and enhance the operationalization of the warehouse receipt system, as well as render available a ready, predictable, and reliable market for smallholder farmers' produce in line with the Zambia CAADP compact"

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<sup>4</sup> <http://www.times.co.zm/?p=69716> Accessed on November 22, 2015.

## Regional Experience

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This section reviews the strategic grain reserves/and or grain marketing boards from Kenya and Ghana. A review of **Kenya's National Cereals and Produce Board (NCPB)**, which is much similar to FRA in terms of the engagement with farmers and the legal framework in which it operates, will provide useful insights into understanding what can be emulated. Ghana was chosen because the CREW project<sup>5</sup> has special interests in Ghana and the competition reforms in the staple food sector.

Like many other African countries, the Government of Kenya has to battle with the food security dilemma. "On one hand there is pressure to ensure that maize farmers receive adequate price incentives to produce and market their crop. On the other hand, it is desirable to keep food prices low to promote the food security interests of a growing urban population, and of the many rural households who are net buyers of maize" (Jayne et al, 2007:1).

The government has addressed this dilemma through the NCPB, a board that is similar to the FRA in Zambia. Both institutions act as strategic grain reserves and grain marketing boards, even though the latter role is less pronounced in Kenya as will be elaborated.

NCPB like FRA, has in some years bought almost the entire marketed surplus from farmers. For example, from 1988 through 1995, NCPB purchased roughly 50 to 70 percent of the estimated total maize surplus marketed from domestic production (Nyoro et al., 1999). The NCPB has set prices that are often higher than the private sector price. However, in some years, prices have been set lower. Because there are other factors that influence the choice of a marketing channel, the NCPB has still managed to buy the required stock – which is far less than it was in the 1980s. By setting prices higher than the market price, it is possible that the NCPB has also hampered the development of the private sector and other parallel markets. The main difference is that KNCPB buys even from aggregators while FRA has a policy of buying from smallholder farmers only.

In the literature, there is little discussion of the price setting mechanism in Kenya. However, there is agreement that that the activities of the NCPB have increased the mean price, hurting net buyers (58 percent of farmers), and advantaging the net sellers who are usually better off. However, the board has also managed to achieve its narrowly defined objective of increasing agricultural production and productivity and stabilising prices (Mather and Jayne, 2011).

Two positives lessons emerge from the analysis of NCPB's activities. Firstly, the NCPB has drastically reduced the amount it purchases on the market, leaving the

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<sup>5</sup> The CREW project ([www.cuts-ccier.org/crew](http://www.cuts-ccier.org/crew)) has been implemented in four countries by CUTS together with its partners, viz. Ghana, India, The Philippines & Zambia



private sector enough quantities to buy and thrive. Secondly, the Board has geographically restricted itself to just one province (Rift Valley) which is a national breadbasket thereby allowing traders to play a role in other locations.

**Ghana's National Buffer Stock Company (NAFCO)** was established in 2009 with a mandate to provide minimum guaranteed price, mop produce left by private buyers to minimise post-harvest losses; and manage government's emergency food relief. The agency was not meant to be a monopoly in the procurement of maize (CUTS, 2009). From the report by ISSER (2015),<sup>6</sup> NAFCO has had minimal effects on both the price of maize and the market itself. There is no evidence to suggest that NAFCO has impacted the market positively or negatively. From the viewpoint of competitive markets, this is a good step.

There are three main reasons that NAFCO could have not changed the market structure. Firstly, NAFCO only buys a small share of the marketed surplus. It occupied only between 2-5 percent of the market, compared with FRA which goes as high as 83 percent. This means it has no dominance in the market and its price setting mechanism, at this low share of the market is not likely to affect either the market or the market players. Secondly, the government, through the Ministry of Agriculture (Government of Ghana) has emphasised to the farmers in Ghana that NAFCO is a 'buyer of last resort' when they cannot find a private buyer. This allows the market to give first priority to private buyers. Thirdly, NAFCO uses licensed buyers who are hired private buyers, allowing the private sector to develop as they gain experience. NAFCO prices have also consistently been lower than the market price for almost all years (Angelucci and Pierre, 2014).

In this regard, NAFCO has reduced the mean maize and rice prices, unlike the case of Zambia and Kenya. This could be a result of NAFCO's price setting mechanism. Instead of the board, which is influenced by government, NAFCO has a committee that considers the production cost and adds a 10 profit premium to arrive at the price. This means that maize prices are not used as a political tool (assuming the independence of the committee).

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<sup>6</sup> This report is available at: [www.cuts-ccier.org/crew/pdf/Diagnostic\\_Country\\_Report-Ghana.pdf](http://www.cuts-ccier.org/crew/pdf/Diagnostic_Country_Report-Ghana.pdf)

## Conclusion and Recommendations

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### Conclusion

This paper shows that government's rationale for setting a floor price in maize markets through operations of the FRA is based on welfare and political concerns. 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 for the citizens of the country.

Maize is grown by over 80 percent of smallholder farmers and is a key source of income. The government, therefore, wants to ensure that the average price level of maize does not fall too low and that the price is not too volatile. Both these factors could have serious negative economic impacts on smallholder maize producers. Further, there is a wide perception that political concerns also contribute to why FRA intervenes in maize markets, as there are major potential political gains that could come from intervening directly in a market where the bulk of the population participates.

The analysis in this report has also shown that setting a floor price in the maize markets is aimed at providing adequate production incentives and stabilising maize prices for farmers. The results show 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. There was no significant relationship between price and an election year. However, it was observed that a percentage increase in expected sales leads to a 0.5 percentage increase in price.

With regards *quantities* purchased, we find 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. If FRA was purchasing strictly for strategic reserves, a negative effect is expected here too. Quantities purchased would relatively decline when there is an increase in expected sales (and production). Finally, it is observed that during an election year, FRA buys about 1.5 times more maize than they buy in other years. These findings clearly illustrate that FRA interventions in maize markets are suboptimal, and lead to market inefficiencies.

The paper has further assessed how FRA's operations and setting of a floor price have impacted maize markets and key market participants in Zambia. It has been observed that in some instances, instead of acting as a 'floor price', the price set by FRA has acted as a 'price ceiling' and impacted negatively on producer gains,

compared to if the market was operating freely. The rationale for FRA interventions have been based on welfare concerns, but this report finds that the policies are regressive and harm a large proportion of rural households (who are net buyers of maize) and urban consumers through high maize meal prices. Therefore, government welfare concerns are not met by current FRA policies. Further, the paper finds that FRA maize floor pricing activities have crowded out key players in the maize markets, like: (i) commercial maize producers who have seen a decline in futures maize contracts, (ii) commercial millers due to selective subsidy allocations to millers (iii) Informal millers as maize has become too expensive for them and small holder traders who have become uncompetitive.

Finally, it has been observed that smallholder farmer diversification has been negatively affected. This is due to inadequate government funding to other crops and activities like research and development required fostering agriculture diversification, and the influence that FRA has had on smallholder farmers' choice on what to produce.

Finally, the paper has conducted a regional assessment of strategic grain marketing boards in Kenya and Ghana. The main lessons that Zambia can learn is to restrict the amount of commodity bought for strategic reserves only and to buy only in predetermined locations.

## **Key Recommendations**

The FRA is an important institution. Its mandate of maintaining food reserves and stabilising the prices of key agriculture commodities is important in ensuring that the country attains food security. However, it is possible for the FRA to attain its welfare goals without unnecessary and inefficient intervention in maize markets. To achieve both food security and ensure the optimal functioning of not only maize markets, but also wider agricultural markets in the country, Zambia needs a clear maize marketing bill that ensures the following:

1. The FRA sticks to its mandate of purchasing only national reserves  
Zambia has been producing over 2.5 million metric tonnes of maize since the 2009-2010 agriculture season. Despite these maize surpluses, there have been widespread shortages in maize meal across the country, and prices have continued to skyrocket. If the FRA can stick to buying only what is required for strategic reserves, their activities would not have the distorting effects that they currently have in maize markets. Reduced FRA intervention would allow the private sector to thrive, and operate competitively in the market (however, this should be preceded by development of a system for supervision of the behaviour of players, especially with respect to price realisation by the farmers). Of course, maize is the staple food in the country and there is a need to intervene and ensure adequate supply and sufficient incentives to guarantee its production. However, this can be achieved by allowing the private sector to operate in a competitive market, and therefore allowing Zambia to become a regional supplier.
2. The floor price must benefit the rural poor and urban consumers.

The current floor price mechanism only benefits a few farmers who are net sellers of maize (46 percent). A further look suggests that only five percent of smallholder households account for 50 percent of marketed maize surplus. *Already better off households account for the majority of maize sold to FRA.* Moreover, the maize 'floor price' acts as a 'price ceiling' in some years when maize prices could rise much higher than the government set price. **By allowing adequate competition in the maize markets, and letting FRA purchase only strategic reserves the market can be made to work better for both the producers/farmers and the consumers of maize.** The government can only intervene when it becomes necessary to enforce a floor price.

3. More efforts should be targeted towards making farmers competitive by increasing their productivity.

The welfare concerns of FRA can be better achieved by making farmers more competitive. While budget allocation to the agriculture sector has increased by over 30 percent since 2013, most program funding goes to only two activities: input subsidies and the FRA. In 2015, 98 percent of all programme funding was spent on subsidies and maize purchases. Investing this money in other activities can make more sustainable welfare gains. Key investment areas include Research and Development, extension services, improved rural infrastructure and the promotion of other agriculture commodities (both crop and livestock) among smallholder farmers. Research in Asia has shown that while investing in subsidies has rates of return between negative and 12 percent, investments in research and extension service have rates of return of between 35 percent and 70 percent. This makes investments in agriculture Research and Development and extension much more important for poverty reduction and meeting the governments welfare concerns.

4. Encouraging more competition among milling companies and other value chain participants.

Maize is a staple food and there is need to establish strategic reserves. However, the FRA must stop selling its maize to commercial millers. Instead, FRA can sell its maize to smallholder cooperative mills that are being set up across the country. This is a good initiative that must be supported fully. This way, commercial millers can be allowed to participate competitively in the market. Governments' *ad hoc* prices have crowded out private sector participation in maize markets and contributed to high maize meal prices despite bumper maize harvests. By allowing millers to buy their own required stocks of maize directly from the market, this will encourage more competitive and efficient pricing of maize. Low FRA participation will also lead to the operation of other market players like commercial farmers, informal millers and traders that have been crowded out. Freed resources can then be invested in research and extension services to smallholder farmers.

5. Instituting a warehouse receipt system for maize marketing.

To avoid maize prices getting too low and to protect farmers from unscrupulous (briefcase) businessmen, government can mandate maize to be

marketed using a warehouse receipt system. This would require all maize to be sold through a warehouse, and any sales on the open market would be illegal. The FRA price could be used as a futures guaranteed price, and then market players would be allowed to buy and sell through the warehouse at an agreed price. This way, maize markets could become more competitive and efficient without risking farmers losing out.

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