



Review of Strategic Food Reserves Policies for Improving Resilience to Drought



SOUTHERN AFRICA
Drought Resilience Initiative
Livelihoods and Food Security



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TABLE OF CONTENTS

Table of Contentsiv

List of Tablesv

List of Figuresv

Boxesv

ACRONYMSvi

ACKNOWLEDGEMENTSviii

EXECUTIVE SUMMARYix

Zambiax

Zimbabwexi

PART 1. INTRODUCTION1

PART 2. FOOD SECURITY AND STRATEGIC GRAIN RESERVES IN ZAMBIA2

- 2.1 Overview of food security situation in Zambia3
- 2.2 SGR Management7
- 2.3 Fiscal cost of SGR Management8
- 2.4 Strategic Reserves Facilities and Location9
- 2.5 Grain Buying Modalities11
- 2.6 Selling and Distribution Practices13
- 2.7 Food Needs and Implications on the size of SGR14
- 2.8 Food Emergency Responses and Country-Level Coordination15
- 2.9 Grain Reserves and Synergies with Early Warning Systems16
- 2.10 Reserve Targets Under Different Scenario of Emergency Needs18
- 2.11 Recommendations to Enhance Management of SGR in Zambia19

PART 3. FOOD SECURITY AND STRATEGIC GRAIN RESERVES IN ZIMBABWE24

- 3.1 Overview of Food Security Situation in Zimbabwe25
- 3.2 Management of the SGR28
- 3.3 The fiscal cost of SGR Management29
- 3.4 Strategic Reserves Facilities and Location31
- 3.5 Grain Buying Modalities32
- 3.6 Reserve Selling and Distribution Mechanisms35
- 3.7 Emergency Food Needs and Implications on the Size of SGR36
- 3.8 Size of the SGR under Different Scenarios of Emergency Needs39
- 3.9 The GMB's social functions and commercial function40
- 3.10 Synergies of SGR management with Early Warning Systems41
- 3.11 Recommendations to Enhance Management of the SGR in Zimbabwe42

CONCLUSION45

REFERENCES48**ANNEX52**

Annex 1A52

Annex 1B53

Annex 2A54

Annex 2B55

Annex 2C56

Scenario 1: Low levels of poverty and mild emergency disaster56

Scenario 2: Low levels of poverty and severe emergency disaster56

Scenario 3 (high levels of poverty and mild emergency disaster)56

Scenario 4-high levels of poverty and severe emergency disaster57

LIST OF TABLES

Table 2.1: Historical Food Needs for emergency purposes in Zambia (2009-2019)4

Table 2.2: FRA Budget Allocation, Maize Production, Expected Maize Sales, and SGR Purchases, 2014 to 20208

Table 2.3: Zambia's Storage Capacity by Operator9

Table 2.4: Types of Storage Facilities and their Capacity11

Table 2.5: Zambia's Relief Food Requirements (Worst Case Scenario)19

Table 2.6: Summary of Key Issues and Recommendations to Enhance the Effectiveness of SGR Management and Emergency Food Responses in Zambia20

Table 3.1: Food relief responses during years declared national disaster27

Table 3.2: Maize producer prices - RTGS converted to US\$ at Interbank rates30

Table 3.3: National Production, GMB stocks, imports, disbursements to social welfare, millers and local sales and food needs, 2009-202034

Table 3.4: SGR requirements under 4 different Scenarios of Emergency Needs37

LIST OF FIGURES

Figure 2.1: Zambia Trends in Maize Surplus/Deficit (1990/91-2018/19 Agricultural Years)3

Figure 2.2: FRA storage distribution in the disaster hotspots10

Figure 2.3: Vulnerable Districts with no FRA Storage as per ZVAC 201910

Figure 2.4: Maize Sales and FRA Purchases in Zambia13

Figure 2.5: Trends in the Size of Zambia's SGR14

Figure 3.1: Zimbabwe: Trends in Maize Surplus/Deficit (1986/87-2019/20)25

Figure 3.2: Maize production and proportion of households requiring food assistance, 2009-202026

Figure 3.3: Proportion of Households Requiring Food Distribution By Quarter: 2015 - 202026

Figure 3.4: GMB Depot Network in Zimbabwe29

Figure 3.5: Cereal (maize and small grains) sufficiency31

Figure 3.6: Scenario of Emergency Needs31

BOXES

Box 2.1: Zambia's SGR Early Warning System17

Box 3.1: Integrating Nutritionally –Enhanced Maize in National Procurement: Zimbabwe37

ACRONYMS

ADMARC	Agricultural Development and Marketing Corporation
AMC	Agricultural Marketing Council
ARMS	African Rural Marketing Scheme
ASEAN	Association of Southeast Asian nations
ASPEF	Agriculture Sector Productivity Enhancement Facility
CCEDPM	Cabinet Committee on Environment, Disaster Preparedness and Management
CFS	Crop Forecast Surveys
CPD	Civil Protection Department.
DDMCs	District Disaster Management Committee
DMMU	Disaster Management and Mitigation Unit
DRC	Democratic Republic of Congo
DTA	Debt Takeover Agreement
EC	European Commission
ECOWAS	Economic Community of West African States
EPDMA	Emergency Preparedness and Disaster Management Authority
FAO	Food and Agriculture Organization
FNC	Food and Nutrition Council
FRA	Food Reserve Agency
FSNC	Food Security and Nutrition Council
FEWSNET	Famine Early Warning Systems Network
FSWR	Food Security Wheat Reserve
GMB	Grain Marketing Board
GMP	Guaranteed Minimum Price
IAPRI	Indaba Agricultural Policy Research Institute
LBA	Licensed Buying Agents
LBC	Licensed Buying Companies
LINCTO	Lint Company of Zambia
MVAC	Malawi Vulnerability Assessment Committee
MFED	Ministry of Finance and Economic Development
MECHI	Ministry of Environment, Climate and Hospitality Industries
MHCC	Ministry of Health and Child Care
MIC	Ministry of Industry and Commerce
MLAFWRR	Ministry of Lands, Agriculture, Fisheries, Water and Rural Resettlement
MLGPW	Ministry of Local Government and Public Works
MFAIT	Minister of Foreign Affairs and International Trade

MPSLSW	Ministry of Public Service Labour and Social Welfare
MECHI	Ministry Environment, Climate and Hospitality industries
MFAIT	Minister of Foreign Affairs and International Trade
MT	Metric Tons
NAFCO	National Food Buffer Stock Company
NAMBOARD	National Agricultural Marketing Board
NCPB	National Cereals and Produce Board
NEWU	National Early Warning Unit
NFR	National Food Reserves
NFRAM	National Food Reserve Agency Malawi
NFBS	National Food Balance Sheet
Non-GMO	Non Genetically Modified Organisms
OVP	Office of the Vice President
PHS	Post-Harvest Survey
REWU	Regional Early Warning Unit
SARCOF	Southern African Regional Climate Outlook Forum
SGR	Strategic Grain Reserve
SADC	Southern Africa Development Community
SFRTF	Strategic Food Reserve Trust Fund
SI	Statutory Instrument
SGRD	Strategic Food Reserve Division
UN	United Nations
US\$	United States Dollar
USA	United States of America
WARMA	Water Resources Management Authority
WB	World Bank
WFP	World Food Programme
WRS	Warehouse Receipt System
ZAIS	Zimbabwe Agricultural Information Service
ZCF	Zambia Cooperative Federation
ZIMACE	Zimbabwe Agricultural Commodity Exchange
ZIMSTAT	Zimbabwe Statistics Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee
ZMD	Zambia Meteorological Department
ZMW	Zambian Kwacha
ZRA	Zambezi River Authority
ZWL	Zimbabwean Dollar

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EXECUTIVE SUMMARY

The increased incidence of droughts and floods has led to food shortages in Zambia and Zimbabwe, causing the number of vulnerable households in both countries to increase over time. Strategic Grain Reserves have been used as a tool to cope with emergency food needs. However, the efficiency and effectiveness of the SGR in addressing food emergencies is less clear. The agencies responsible for administering the SGR have faced mixed reviews, with a clear indication that improvements are needed. Against this background, this study was commissioned to provide a diagnostic of the SGR operations and management in the two countries in relation to emergency food responses and make recommendations to improve their role in enhancing food security. This report documents the current SGR practices in relation to emergency food responses, the issues, and challenges faced, and provides recommendations for improving emergency food responses.

ZAMBIA

The management of the SGR for food emergencies and price stabilization in Zambia has been a major cost on the Treasury. The Food Reserve Agency (FRA) operations in some years have drawn a large amount of the resources allocated to the agricultural budget. In 2020, more than US\$ 36 million was allocated to finance the FRA grain reserve operations. Apart from the huge costs to the Treasury the price stabilization policy has had negative effects on private sector participation and depressed investments in the maize sector. Some large market players stopped their maize market operations mainly because of the ad hoc market participation of the FRA, particularly when rotating the SGR stocks as well as inconsistent trade policy.

The study recommends that the FRA limit its purchase to only the required SGR amount and should buy these stocks from areas where the private sector is less likely to operate. Also,

The study involved desk research to establish the existing body of knowledge regarding the management of national grain reserves in Zambia and Zimbabwe. Data collection activities in both countries mainly relied on publicly available information with additional information obtained directly from the source. In cases where information was not available or provided, assumptions were made based on available information for purposes of drawing recommendations. In both countries, the findings and recommendations in this report were consulted and validated with the key stakeholders.

The study identified three (3) broad areas for improvement across both countries. These include (a) reduction in the fiscal costs involving the management of the SGR; (b) improvements in the delivery of emergency assistance; and (c) the need to crowd in the private sector.

to incentivize farmers to produce for the next season, it is important that the FRA becomes buyer of last resort so that it can be available when farmers fail to get a market or the market price fails to rise above the floor price offered by the FRA. Therefore, to be a buyer of last resort, the FRA should buy at the tail end of the market. This will also help limit the pressure on the Treasury, while giving farmers more options to market their crop.

From a logistics point of view, the study found that grain reserve storage facilities across the country are highly skewed, and in most cases inexistent in the disaster hotspots. This raises the cost to the Government since food must be moved from the major consumption zones and tends to delay responses. The study recommends the promotion of community-level grain banks and establishment of aggregation centers in disaster hotspots that can be operated in collaboration with non-state actors.

There are also some gaps in the generation of early warning information. Information on the stocks position to inform decisions is only from a few actors and there are capacity challenges related to the conduct of rigorous analysis related to beneficiary identification and targeting. To address these challenges, it is proposed that investments be made to enhance the stock monitoring capacity in the Ministry of Agriculture and capacity building of Disaster Management and Monitoring Unit and relevant members of the vulnerability assessment committee. Additionally, practices implemented in managing the grain reserve needs to be reviewed, with possible enhancements to limit post-harvest losses during the storage of the crop.

The study finds that current emergency food responses can be diversified to provide nutrition benefits to food insecure households. Maize and maize products are provided as a large part of the

relief foods. Because disaster prone areas are usually the same, the inclusion of Vitamin A biofortified maize (orange maize) in the SGR purchases and relief food distributions could improve nutrition outcomes for affected households, particularly vulnerable women and children. In addition, it is recommended that a study be carried out to assess the feasibility of fortifying maize released to millers at the time of milling by adding important nutrient elements to the milled maize to help address the malnutrition situation in Zambia.

It is important to highlight that the projected savings from reducing the size of the stock procured annually, in addition to the savings resulting from the improvement of the storage conditions will be significant, and can be re-allocated to provide other services either in the agriculture sector such as irrigation, technology transfer or in other areas of support such as social protection.

ZIMBABWE

The fiscal cost of Zimbabwe's grain reserve intervention has been high and unsustainable.

In 2018, grain purchases by the Grain Marketing Board were US\$ 473 million or about 3.4% of GDP and the price subsidy provided to millers about 2.1% of GDP. The cost of such interventions were considerable as a share of Government expenditure and GDP, creating a significant fiscal imbalance. The GMB purchases large volumes of maize and disposes the commodity at below-market prices, resulting in significant losses. The cost continues to escalate as the government recently introduced a new regulation (SI 145 of 2019) making the GMB the 'buyer of first resort' – ensuring grain procured by the Government enjoys dominance in the market, leaving out the private sector. In this arrangement, the private sector relies on the GMB to procure and store maize for them before obtaining the grain for processing at subsidized prices. This is inefficient and benefits large and well-off farmers at the expense of the

poor who are the targeted beneficiaries.

To reduce the fiscal cost the Government should consider cutting the size of the physical strategic reserve. The current policy of making GMB the sole buyer increases the burden on the Government limited budget. Private sector should be allowed to buy their own grain requirements at market prices. The output price subsidies to farmers and miller subsidies strain the Treasury and divert limited financial resources from other pro-poor public support programs essential to build resilience and ensure food security.

Currently, the purchase of maize is restricted to the GMB. This excludes many private actors and limits their role to complementing government efforts in food emergency responses. The promotion of maize market liberalization with free private sector participation and market price determination could improve the status quo. In

this situation, the GMB would retain its role as a buyer of last resort to address emergency food shortages and encourage production. This will reduce the size of the GMB reserve holding. In this case the current storage that will be vacant can be leased to the private sector, generating income to finance the management of SGR.

It is important to improve the quality of early warning information both for weather and prices to improve decision making related to disasters.

Crop forecasting faces challenges while market information systems are not fully developed, and this has implications for decisions around SGR size and trade policy. The study proposes investments in remote sensing capabilities at the Meteorological Department and developing a centralized market information system.

The private sector must be viewed as a partner in responding to food emergencies in Zimbabwe.

There are issues related to diminished private sector participation owing to the GMB's increased

role as a buyer of the staple food to maintain food availability and the associated setting of a buying price. We recommend a move toward liberalizing the maize market by allowing the procurement of grain by the private sector directly from farmers and storage and processing outside of the GMB. Current stock rotation practices in Zimbabwe are at variance with the market conditions and create losses for the GMB. The government of Zimbabwe must invest in a market-based stocks rotations to avoid distortions and allow all actors to participate with transparency in the selection process and financial transactions.

There is poor targeting of vulnerable households for relief food provisions in Zimbabwe.

Maize is usually sold to millers at subsidized prices with the goal of reducing the mealie meal retail prices. However, this does not achieve the intended goal. Instead, it creates arbitrage opportunities for unscrupulous businesspeople. In the current high inflationary situation, the study proposals the use of direct food delivery to vulnerable households.

PART 1 | INTRODUCTION

Zambia and Zimbabwe have experienced food security emergencies of varying severity, mainly caused by drought and floods in some areas. Like several countries in Africa and elsewhere, the two countries have developed and used Strategic Grain Reserves (SGR) to cope with food emergencies and other functions to ensure the availability of food. Both countries have years of experience with SGR as a key component of their respective food security policies. At the center of this strategy is the availability and sufficient supply of white maize, as the single most important strategic crop. Zimbabwe and Zambia have put maize at the pinnacle of their food security policy, mandating government agencies, the Food Reserve Agency (FRA) in Zambia and the Grain Marketing Board (GMB) in Zimbabwe, to manage their strategic reserves.

The effectiveness of their grain reserve approaches and the management agencies has faced mixed reviews, with some arguing that they need to be disbanded because they have been marred with political interference that has bankrupted the countries and are also irrelevant in liberalized market economies. Others argue that the institutions will always be relevant because they are key to safeguarding the country's food security and also ensure that smallholder farmers are not taken advantage of by the private traders, dubbed so-called 'briefcase traders'. Still others say that the millions of tons of grain that were required in the past are no longer relevant because consumption patterns have changed. They argue that levels of grain reserves should be revised downward and the reserves portfolio diversified to include grain, cash, and virtual stocks to save public resources for other equally important social protection programs. As the debate rages, the incidences of climate shocks have increased and the ability to maintain food security has reinforced the arguments for strengthening

institutions such as the FRA and GMB.

There is no doubt that these institutions require some reforms and to have their operations strengthened to be able to effectively address food security emergencies. In addition, market stabilization objectives are necessary while conforming to the rapidly changing marketing and trade environment. Against this background this report provides a review of the SGR operations and management in dealing with food emergencies and market stabilization and makes recommendations in the two countries. The report was commissioned by the World Bank in order to assist the governments of Zambia and Zimbabwe to review their national strategic grain reserve practices for domestic food security and identify potential improvement interventions.

The study involved desk research and interviews with key people. Data collection activities in both countries mainly relied on publicly available information with additional information obtained directly from the sources. In cases where information was not available or provided, assumptions were made based on available information. The report was subjected to stakeholder validation in both countries before it was finalized. The list of stakeholders consulted during the validation workshops are presented in Annex 2a and Annex 3a.

The study is organized into four (4) parts as follows: Part 1 presents the introduction laying out the background, objectives, methodology and structure of the report; Parts 2 and 3 present separate country analysis for Zambia and Zimbabwe containing subsections covering the overview of the food security situation, strategic grain reserve operations and management in relation to food emergencies and recommendations to enhance the strategic grain management, and Part 4 presents the conclusion.



PART 2
**FOOD SECURITY AND STRATEGIC
GRAIN RESERVES IN ZAMBIA**

2.1 Overview of food security situation in Zambia

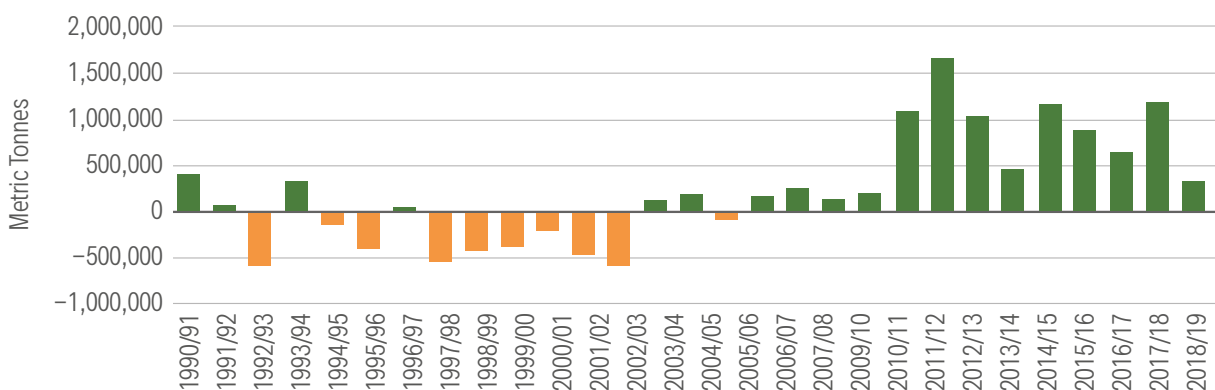
Despite consistent maize production surpluses in recent years, Zambia remained relatively food insecure. The 2019 World Hunger Report ranked Zambia's hunger status as 'alarming' together with three other countries, Chad, Madagascar, and Yemen.¹ Using the national nutrition indicators (wasting, stunting and underweight), Zambia Statistics Agency (ZSA) et al reported that 35 percent of children under 5 in the country are stunted, a slight improvement from 40 percent reported in the 2014 Demographic and Health Survey (DHS). Underweight (weight-for-age) rates reduced from 15 percent in 2013/14 to 12 percent in 2019, while acute malnutrition, measured by wasting or low weight-for-height, now affects 6 percent of the children, an increase from 4 percent recorded in 2013/14 (Mofya-Mukuka et al. 2020).

Developing the agricultural sector is recognized as a solution to dealing with food insecurity and nutrition challenges in the country. Government policy for many years has focused mainly on becoming self-sufficient in maize production with direct support for input distribution, with limited public funding to key drivers of agricultural growth and resilience such as research and development, extension, irrigation and

farmers' access to information. Also, there has been limited funding to support agricultural diversification into more nutritious crops as well as livestock and fisheries products. The vast majority of the rural farmers (approximately 90 percent) predominantly produce maize and this is prevalent across the whole country. The cereal (maize) centric production system has resulted in limited household dietary diversity that has contributed to high malnutrition rates in the country.

Zambia has emerged as a consistent surplus producer of maize with production exceeding local human consumption and industrial requirements (Figure 2.1). Despite many years of surplus stocks at the national level, adverse weather in the form of frequent cycles of droughts and floods along with other factors negatively affect cereal availability at the household level, with the effects most pronounced in the drought and flood-prone southern half of the country (see Braimoh et al. 2018). As shown in Table 2.1, the resultant shortage in production at the household level necessitates emergency food responses by the government, non-governmental organizations, and the United Nations Agencies.

Figure 2.1: Zambia Trends in Maize Surplus/Deficit (1990/91 and 2018/19 Agricultural Years)



Source: Zambia National Food Balance Sheets (1990/91 – 2018/19)

¹ See <https://www.globalhungerindex.org/pdf/en/2019.pdf>

There have been several food crises in Zambia, particularly in the moderate to severe drought years. This has been caused by an increase in the incidence and intensity of weather shocks that adversely affect largely rain-fed agricultural production (see Braimoh et al. 2018). As table 2.1 shows, in moderate drought years, the number of affected individuals ranges between 77,088 and 1,269,054 persons. In the more severe drought

years, the number of affected individuals ranges from 1,041,852 to 2,330,182 persons. Assuming 12.5 kilograms of maize per person per month for six months (using the WFP recommendation of 400 grams per person per day), the food needs in the moderate drought years range from 29,184 metric tons to 95,179 metric tons. In severe drought years, the requirements range from 78,139 metric tons to 174,764 metric tons.

Table 2.1: Historical Food Needs for emergency purposes in Zambia (2009–2019)

Year	No. of affected people (ZVAC)	Affected People (% of the Population)	Total Cereal Requirements for 6 months	Food security conditions	Size of the SGR (Actual FRA Purchases)
2009	–	–	–	No drought	73,876
2010	–	–	–	No drought	198,629
2011	–	–	–	No drought	883,036
2012	389,124	2.7	29,184	Moderate drought	1,751,660
2013	1,269,054	8.5	95,179	Moderate drought	1,046,000
2014	–	–	–	No drought	426,248
2015	612,840	3.9	45,963	Moderate drought	1,031,303
2016	1,041,852	6.4	78,139	Severe drought	595,883
2017	77,088	0.5	5,782	Moderate drought	280,045
2018	831,743	4.8	62,381	Moderate drought	513,547
2019	2,330,182	13.0	174,764	Severe drought	N/A

Source: Adapted from National Food Balance Sheets (2009–2019) of the Republic of Zambia, (2019).

Historically, emergency food responses have involved the provision of (i) maize only (ii) maize, pulses (beans or cowpeas), and vegetable oils and (iii) maize and maize meal to affected households. The inclusion of pulses is a more recent practice and recognizes the need for nutritionally-balanced food aid. The government through the Disaster Management and Mitigation Unit (DMMU) only distributes maize sourced from the FRA directly for free since it is a government unit or paid for when this is done by other actors working with the DMMU.

Every year, on May 1, the FRA starts announcing its procurement plans for the year as the agency

has a predefined list of agricultural commodities to buy. Operations of the FRA are governed by the Food Reserve Act, Cap 225 of the Laws of Zambia, which came into effect in 2005, allowing the FRA to enter the market as a trader. Over the last years, the role played by the FRA has helped to slightly improve the food security situation in Zambia. FRA releases maize, which is the major crop procured by the agency to various governmental and non-governmental agencies in Zambia.

Non-state actors also include commodities other than maize in the distributed relief food (e.g. pulses, salt, and cooking oil), depending on their budgets. Typically, other commodities are

procured from the market by the emergency relief implementing partners (e.g. Save the Children, WFP, CARITAS Zambia, World Vision Zambia, World Renew, Adventist Relief Agency, and other faith-based organizations). The SGR maize stock is released to implementing partners by the FRA following a Government directive through the DMMU. The DMMU does not distribute relief maize unless in emergency conditions that require quick responses.

The WFP have revealed that the maize requirements were estimated at 12.5 kilograms of maize per person per month. However, the provided monthly package by WFP included 6.5 kilograms of mixed beans/soya beans, vegetable oil, and 12.5 kilograms of maize per household. The maize provided fell way below the recommended 12.5 kilograms per person per month. Assuming an average 5 members per household, this reflects a cereal deficit of 62.5 kilograms per household per month. This deficit reflects the government's attempt to reach many households at the expense of an adequate response that meets daily calorific requirements. In the same year, there were challenges in locally sourcing pulses due to the depressed supply caused by the drought. The fact that beans and cowpeas have historically not been procured under the strategic reserves compounded the problem as they had to be sourced from the open market. Further, the increase in the number of affected people due to population growth contributed to a suboptimal response.

Zambia's approach to emergency food responses faces challenges. In the recent past, the focus has been on the provision of maize or maize products only. The provision of maize meal is in recognition of the fact that households may not be in a position to pay for the milling of relief maize they receive. In the distant past, stakeholders indicated in interviews that emergency food responses by the government included other commodities, however, this is no longer the case due to an increase in the number of affected people. The

inclusion of other commodities has implications on the required resources, especially with the Government's tight fiscal position.

Another element related to the efficacy of responses is how food aid is disseminated to targeted persons. The FRA's standard operating procedures (FRA 2019), lists approaches to addressing food emergency needs. The standard approach is through community sales to affected individuals by the FRA in lean periods as was the case for the 2019 crisis. Other approaches aimed at achieving similar objectives include a price stabilization intervention that involves the release of maize to selected millers as has been done in past years.

Another approach involves distributing maize to individuals who are beneficiaries of the social cash transfer scheme administered through the Ministry of Community Development and Social Services (MCDSS) (see DMMU 2019; FRA 2019a). The 2019 food crisis was addressed through community sales of maize. Affected individuals registered through district commissioners and accessed maize from the district FRA depots at ZMW 111 per 50 kilogram bag of maize. Around the same time, the market prices for maize were higher than the FRA price, for example in Gwembe district, the price of maize was ZMW 248 per 50 kilogram bag (Banda, Mulenga and Chapoto 2019). Only one 50 kilogram bag of maize was allowed per household, however, the validation process was porous leading to some households accessing multiple bags, with reports of reselling by some households. About 19,714 metric tons of maize were sold to communities between January and October 2019 (FRA 2019b).

Another issue observed with the food emergency needs response is that even in areas that are predominantly non-maize consuming, maize is the default relief food. This raises questions about the adequacy and rationale behind the procurement of paddy rice for SGR purposes.

The interventions have in the past faced challenges around targeting, tardy responses, a lack of some commodities, and inadequacy of the relief food. With targeting, past evidence shows that Zambia had limited information on the demography and problems of vulnerable households (Samatebele 2003). Related to this, in many periods leading up to elections, politics creates problems for the efficacy of emergency responses and targeting. Typically, some of the maize or maize meal meant for the affected communities ends up in areas not designated for relief food provision. These are usually areas with by-elections. The result is limited maize supply to affected communities as the food requirement is distorted. This perhaps explains the huge deficit observed in the 2019 response.

At no time has the FRA been unable to supply cereal (maize) to the DMMU for relief purposes. To contextualize this, for the most recent crisis in 2019, between January and October, 19,714 kilograms of maize were sold through the communities by the FRA. While the DMMU drew 56,107 kilograms of maize over the same period. Other maize drawn for purposes of school feeding programs through the Ministry of General Education was 10,354 kilograms of white maize. In total, maize grain drawn from the FRA for relief food purposes was 86,175 metric tons for the period January to October 2019 (FRA 2019b). All this is less than the current 500,000 metric ton reserve target. Note that the relief food sales do not include maize

sold to millers for the price stabilization role or to the region through agencies such as the World Food Programme.

While national SGR adequacy for maize is assured, the distribution of the SGR stocks across the country in any particular year is a critical issue. The adequacy for affected areas depends on how much maize the FRA can procure and store across the country. In some years, stocks may need to be transported from other areas to meet relief demand in deficit areas.

The FRA also stores other crops for SGR purposes including paddy rice and soya beans. Except for 2012 when the agency released paddy rice to the DMMU, most relief efforts are for maize. There are indications that other commodities are not used for relief purposes. One reason for this is that the agency procurement is predominantly maize (99 percent), and because of the general perception that the agency only stocks maize. This leaves room for use of rice for example as a relief food particularly for areas that are predominantly rice consuming. As earlier alluded to, the Agency is empowered to also designate other commodities as strategic crops. To date, the FRA has not procured pulses (e.g. mixed beans and cowpeas) for SGR purposes. It is for this reason that nutrition-related interventions in recent times struggle to meet pulse demand as pulses procured from the market are never enough.



2.2 SGR Management

Strategic Grain Reserves in Zambia originated from as far back as 1969 with the fusing of the Grain Marketing Board (GMB) and the African Rural Marketing Scheme (ARMS) into a single entity, the National Agricultural Marketing Board (NAMBOARD) (Kydd 1986). Between 1964 and 1974, the Zambian government offered different prices for maize to farmers close to the rail line and those in native reserves. The justification for this policy was the transport cost differential between the locations (Andersen 1968). However, in 1974, there was a policy shift toward the pan-territorial pricing system for maize through NAMBOARD.

Despite these efforts, years of mismanagement coupled with deteriorating economic conditions forced the government to dissolve NAMBOARD in 1989 and all its functions were transferred to the Zambia Cooperative Federation (ZCF). The National Agricultural Marketing Act of 1989 was repealed in 1995 and this saw the passing of the Food Reserve Act of 1995 which formed the FRA. The FRA was originally conceived to hold buffer stocks to dampen price variability and provide liquidity in the maize market during the initial years of market liberalization while the private sector was establishing itself.

Although FRA's original mandate did not include the provision of price support to farmers, FRA maize purchases were increasingly relied upon

to shore up prices. Between 1996 and 2002, the government assigned FRA to administer the fertilizer credit program to the farmers, and pan-territorial pricing was introduced for fertilizer distributed by the FRA, which made the private sector's fertilizer uncompetitive in outlying areas. However, the credit repayments were low (around 10 percent), leaving FRA in debt and unable to achieve its stated goals.

The Food Reserve Act of 1995 was amended in 2005, to allow the FRA to participate in the marketing and trade of designated agricultural commodities. The current operations of the FRA are governed by the Food Reserve Act, 2020 assented on 23 October, 2020. The Act was passed to "continue the existence of the Food Reserve Agency and re-define its functions; re-constitute the Board of the Agency; to continue the existence of the National Strategic Food Reserve; to repeal and replace the Food Reserve Act, 1995; and to provide for matters connected with, or incidental to, the foregoing that repealed the Act of 1995." Under this Act, the FRA's mandate is anchored on the following 3 pillars:

1. The management of government-owned storage facilities;
2. Administering the national strategic grain reserve; and
3. Providing market access to smallholder farmers.



2.3 Fiscal cost of SGR Management

The management of the SGR for food emergencies and price stabilization in Zambia is a major item in public expenditure for agriculture. FRA operations have drawn a large amount of the resources allocated to the agricultural budget (see Table 2.2 column B). The size of the maize stocks held by FRA has been a major fiscal burden for a number of years. For example in 2011, the size of maize held by FRA was ~ 2 million tons, while maize production was 3 million tons with FRA purchasing about 53 % of total domestic production with procurement price \$270/ton and release price \$165/ton.² The total cost of FRA was about 1.9% of GDP and 8.2% of total budget. The major issue has been that the Agency buys large volumes of maize and disposes the commodity at below-market prices, resulting in losses. This happens when the agency

is performing its price stabilization function through millers and/or when it is paying off transporters in debt swaps. Typically, these activities involve maize sales at prices that do not reflect market conditions, and the associated costs of storage, handling and distribution of maize. As such, this tends to translate into huge losses for the agency, requiring resources from the Treasury each year. In recent years, FRA has made significant progress in reducing the size of stock to the recommended amount of ~ 500,000 tons to meet domestic needs in case of lower maize production. Mainly due to the Government's constrained fiscal space, FAR has moved towards setting their buyer price close to the prevailing market conditions. This allowed the private sector to compete with the FRA in purchasing grain directly from farmers.

Table 2.2: FRA Budget Allocation, Maize Production, Expected Maize Sales, and SGR Purchases, 2014 to 2020

Year	Budget Allocation (ZMW Million)	% of MoA Budget to FRA	% of Total Ag Budget	Expected Maize Production	Expected Maize Sales	SGR Purchases (metric ton)	FRA Buying Price/metric ton
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
2020	660	19.7	16.6	3,387,469	na	350,179	2,200
2019	672	16.2	12.6	2,004,389	956,369	85,044	2,200
2018	1,051	20.8	16.6	2,394,907	1,106,029	172,761	1,400
2017	943	17.3	17.3	3,606,549	1,969,993	517,959	1,200
2016	750	31.5	21.9	2,873,053	1,332,222	280,884	1,700
2015	993	22.8	22.8	2,618,222	1,533,980	596,193	1,500
2014	1,013	29.2	29.2	3,350,671	1,602,742	1,031,303	1,400

Sources: Ministry of Agriculture, Zambia Statistical Agency, Various Years

^{Na} Data not available

² Food Reserves in Zambia: How to Use Them Better for Poverty Reduction and Diversification. World Bank Technical Assistance: Agriculture Policy Note. https://www.researchgate.net/publication/312630691_Food_Reserves_in_Zambia_How_to_Use_Them_Better_for_Poverty_Reduction_and_Diversification

Moreover, when purchases exceed the Agency's ability to manage grain, the losses are in the form of grain lost in storage (Kuteya and Sitko 2014; Nkonde et al., 2011). For example, in 2014, the FRA bought over 1 million metric tons of maize grain, a quantity double the prescribed SGR target of 500,000 metric tons. Due to very high and rising fiscal and economic costs, the FRA operations need to be improved. In particular, it is recommended that the FRA should scale back its activities in the market and target only purchases between 300,000 -400,000 metric tons, a quantity estimated to be able to meet the

country's maize consumption requirements for at least 3 months (lead time) necessary to allow imports to arrive. It is important to note that the level of SGR is higher than any import requirement from 1990 to 2020, except in 1991/92 marketing season, and thus more than sufficient to meet domestic needs in the case of lower maize production in most years. Also, the savings from scaling back FRA activities to this level could be channeled to social protection programs or other high-return public investments required to enhance the agricultural sector in the country (see Harman and Chapoto, 2017).

2.4 Strategic Reserves Facilities and Location

Maize storage functions are performed by farmers (on-farm storage); grain traders (large multinationals, small-scale traders, and

assemblers); the FRA, and millers. Zambia has a total maize storage capacity exceeding 1.7 million metric tons (Table 2.3).

Table 2.3: Zambia's Storage Capacity by Operator

Storage facility operator	Capacity of storage shed (MT)	Storage shed located in urban/peri-urban areas (%)	Storage shed located in rural areas (%)
FRA	850,000	95	5
Private Traders	558,050	85	15
Millers	200,000	≈100%	-
Farmers	100,000	≈5%	≈95%
Total	1,708,050		

Source: Chisanga and Kabwe (2014), verified to be the current state as at 2020 by key informants

Table 2.3 shows that most of the storage facilities in Zambia are owned by the FRA followed by private, mainly large traders. Most of the storage sheds are in urban and peri-urban areas compared to rural areas. For the FRA, about 95 percent of the storage sheds are in urban areas while 85 percent of the private sector storage sheds are in urban areas. This leaves only 5 percent and 15 percent of FRA and private sector storage sheds in rural areas respectively. The average distance between rural storage sheds and main processing facilities is

about 282 km, while for urban storage sheds, that distance is almost half at 153 km. The implication of this skewed storage investments in urban areas is that most of the maize produced in rural areas must be transported and stored in urban areas.

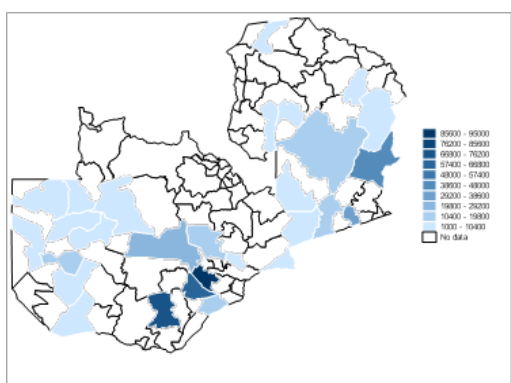
When the location of FRA storage facilities is superimposed on the districts that were targeted for relief food in 2019, about 32 out of the 58 districts that are disaster-prone do not have FRA storage infrastructure (excluding slabs). However,

some of these districts are close to the provincial capitals which have some FRA infrastructure (see Figures 2.2 and 2.3). Out of the 1,090,831 metric tons storage facilities owned by the FRA across the country, 41 percent are located in the areas identified as needing aid in 2019.

This means that in many cases, and in line with the distribution of storage facilities across the country, grain for relief purposes must be moved from the government storage facilities in the major consumption hubs to the deficit or disaster-stricken districts. Typically, grain movement for

relief is done by implementing partners using hired vehicles from private transporters, or by using DMMU trucks. However, the DMMU’s fleet of trucks is very limited for this purpose and poses a challenge to the effectiveness of emergency food responses. In addition, the distribution of storage facility locations and the assessment of vulnerable districts (Figures 2.2 and 2.3) raises a real need to review the location of storage facilities, and propose a need to consider establishing new facilities in areas where there is an absence of storage capacities, or to support communities in establishing their own grain banks.

Figure 2.2: FRA storage distribution in the disaster hotspots

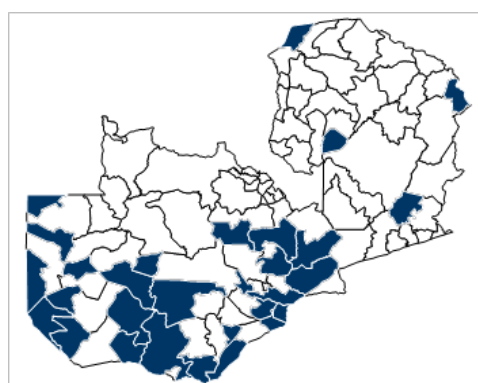


Source: FRA and ZVAC (2019).

The main issue with FRA storage is that the distance from these sheds to the affected areas and communities poses a challenge for relief responses. Typically, maize must be moved from surplus production areas and/or urban-based facilities to disaster areas and back. This raises the cost of transportation and underscores the importance of facilities such as warehouses under the WRS or community. Worse still, when maize meal is used for relief purposes, it must be milled in the south, where the investments in storage and milling facilities are concentrated and transported back to the production zones.

Grains received at the satellite depots are handled by the buying agent engaged by the FRA and the

Figure 2.3: Vulnerable Districts with no FRA Storage as per ZVAC 2019



Source: FRA and ZVAC (2019).

moisture content is immediately checked on-site using a moisture meter. Grains are then screened using grain sieves to remove foreign matter (stones and sand), insect-damaged, shriveled and discolored grain (FRA 2019a). These important initial steps ensure that grains and other crops procured by FRA adhere to the required standards. At the satellite depot, crops are stored by stacking the bags on top of each other.

From the satellite depots, the grain is transported to a central storage facility. These are relatively permanent storage structures located in different regions of the country around district centers. There are typically three types of storage – (a) storage sheds, (b) slabs, and (c) silos. Table 2.4 shows the storage capacity by type of storage.

Table 2.4: Types of Storage Facilities and their Capacity

Storage Facility	Capacity (metric tons)
Sheds	973,760
Concrete Slabs	74,000
Silos	15,000
Total	1,062,760

Source: FRA (2019a).

The condition of the storage sheds has been a cause for concern within government, with the Auditor General's report highlighting in the past (i.e., FY 2013,2014,2015 and 2016) that FRA storage sheds needed renovations as they failed to meet standards, partly due to the lack of periodic maintenance (Republic of Zambia 2017). However, despite this,

the quality of maize from the FRA exceeds private sector maize on the market in recent times because of the strict grading standards set by the Agency when buying from the farmers. On the other hand, private traders do not pay by grade and often pay a discounted price to take into account the losses that will be incurred when the grain is cleaned.

2.5 Grain Buying Modalities

The FRA has a list of grains that it can purchase, and these are referred to as "designated commodities". This list varies from season to season depending on the availability of surpluses nationally and the strategic importance of that crop to smallholder farmers. In 2017, a statutory instrument (SI) was passed that designated paddy rice, white/orange maize, sunflower, soya beans, mixed beans, and groundnuts as strategic crops. However, the crops that have well-established markets are usually not procured by the FRA to avoid disrupting private sector activity. For example, in the 2020/21 marketing season, only white maize, paddy rice, and soya beans are being purchased by the agency. The marketing season opens on May 1 each year and runs until April 30 of the following year.

Following the Food Reserve Act, Cap 225 of the Laws of Zambia, the FRA is mandated to announce its plan for purchases within the following parameters: the type of designated agricultural commodities to be procured; commencement and end dates for the crop marketing exercise; quantities of designated commodities to be

procured; method of procurement and payment to farmers; purchase locations; and purchase price of designated agricultural commodities (FRA 2019a). Quantities to be purchased are determined by the Ministry of Agriculture informed by the Crop Forecast Survey (CFS) and the National Food Balance Sheet (NFBS). The actual quantities to be purchased are based on a 3-month cover, meaning that the country would remain food secure over this period in case of emergencies.

In line with the Food Reserve Act of 2005, the FRA makes the announcement of its plan for purchases (Gazette notice) by May 1 of each year (FRA 2019a), through several satellite depots spread throughout the country. Satellite depots are temporary buying points located within the proximity of the communities where they intend to purchase crops. The setting up of satellite depots varies from year to year depending on the production levels across the country. Farmers deliver the crops in their bags and pay for a designated bag with FRA labels. In the 2020/21 marketing season, the FRA is purchasing the

designated crops through a total of 1,200 satellite depots across the country (Kasama 2020).

The FRA also purchases maize with the moisture content of 12.5 percent and below to minimize grain damage from moisture, reduce weight losses in storage and ensure an SGR with good quality grain. This normally causes delays for the commencement of crop purchases as the grains take longer in the season to attain this threshold moisture content. In comparison, private traders often move in earlier in the season because most do not adhere to the 12.5 percent moisture requirement.

Farmers are paid as and when budgetary allocations to the FRA are released from the Treasury. This has often caused delays when the Government is in a tight fiscal position. In some seasons, farmers have had to wait for several months before they receive their payment from the FRA. In comparison, private traders pay on the spot. This discourages some farmers from selling to the FRA, opting for the private traders even if the price offered is lower. The current marketing season, 2020/21, seems to be an exception regarding the timeliness with paying farmers as some farmers have been paid immediately after supplying to the FRA—this is usually the case in election years or as the country draws close to an election year.

As a large player on the market, the announcement of the FRA buying price tends to influence the level of market prices. For example, in large surplus years, most smallholder farmers start selling their maize only after the FRA has announced its buying price, an indication that FRA holds an important position in the market. This price is pan-territorial and pan seasonal, as it does not vary by location or time.

FRA market activities and the ad hoc trade policy are cited as the two main reasons for production of maize among commercial farmers declining. The FRA's "buy-high and sell low" strategy coupled with ad-hoc export bans has led most commercial

farmers to opt-out of maize in preference for other crops such as wheat and soya beans, where there is less perceived interference by the government. Currently, over 90 percent of the maize is supplied by smallholders.

It is worth noting that although the FRA price generally tends to be above that of the market rate, there have been years when the private sector has out-competed the Agency, resulting in FRA failing to buy the announced target. This normally happens when expected maize production is close to the national consumption requirements. A good example includes maize production shocks due to El Niño weather condition in the 2015/2016 and 2019/2020 agricultural seasons. However, it is important to note that in both years the country had a sizeable surplus as shown in Figure 2.1 in section 2.1.

Another challenge is that the FRA tends to be the main buyer rather than the buyer of last resort. This is because the agency tends to establish its purchasing points even in areas that are well served by the private sector buyers. Stakeholders have for a long time recommended that the FRA concentrate on serving remote areas and not areas well covered by private sector players.

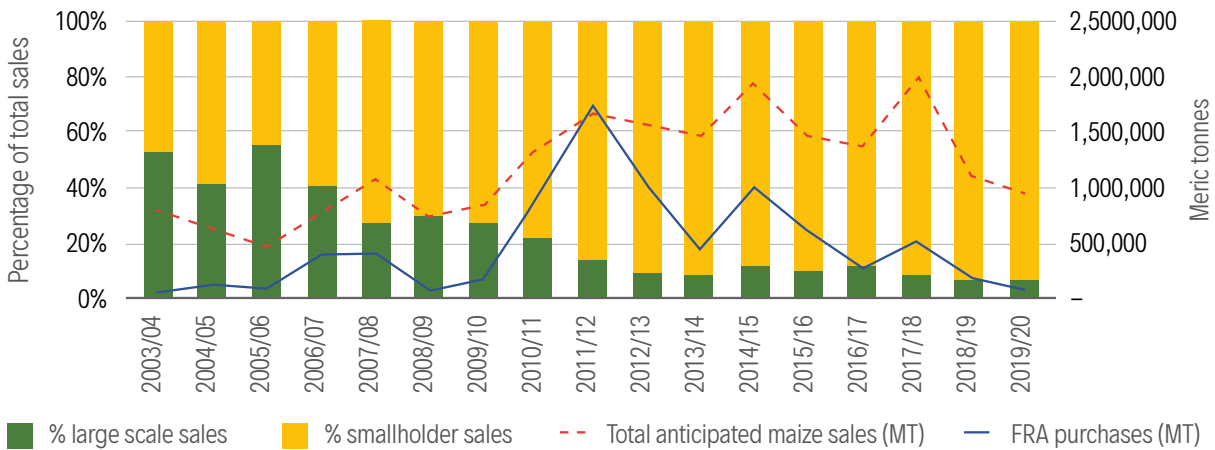
The FRA's purchases have not been consistent as they fluctuate from year to year, creating an uncertain market environment for the private sector (Figure 2.2). The main challenge is that FRA purchases are not rule-based and change depending on supply conditions and are amenable to political interference.

In general, the FRA's maize purchases have trended downward in the last five years, with declarations that the FRA would only purchase about 300,000 metric ton in the 2018/19 agricultural season. At the time, this seemed to agree with the government's pronouncements, particularly in the national budget address by the Minister of Finance that the government was

committed to reducing the size of the SGR. This also coincided with the tight fiscal position that the country found itself in, leaving fewer resources available for the purchases of maize. However, in the 2019/20 season, the government announced

plans to purchase 1 million metric ton of maize for the SGR, a significant departure from the 300,000 metric ton in 2018/19. All this highlights the ad-hoc and unpredictable nature in the actual size of the SGR.

Figure 2.4: Maize Sales and FRA Purchases in Zambia



Source: Ministry of Agriculture /Central Statistical Office various years.

2.6 Selling and Distribution Practices

There are several modalities through which the FRA releases maize to stakeholders in fulfilling its mandate and also arising from demand from international sources. The first is by conducting community sales in collaboration with the DMMU. These sales are meant to help mitigate food insecurity in rural areas during lean periods (FRA 2019a). Community sales beneficiaries access commodities directly from the FRA storage facilities.

Second, the FRA works closely with the district leadership in identifying needy communities and households. The aim is to provide a 50 kilogram bag of maize to each household in the affected communities. Third, the FRA releases maize to the DMMU for relief purposes and this targets vulnerable households who cannot afford to purchase maize. Fourth, the FRA sells commodities directly to schools and hospitals working closely with the district structures. These institutions apply

to the FRA for these commodities.

Fifth, the Agency works closely with the Ministry of General Education and supplies maize to the Home-Grown School Feeding Programme (HGSP) targeting 1 million pupils who are provided with school meals. During the 2019/20 season, several vulnerable households were reliant on maize released by the FRA for emergency purposes while the Ministry of Community Development and Social Services (MCDSS) can also draw maize from the SGR for the social cash transfer.

The government also allows the export of maize for relief purposes to neighboring countries who are in deficit. Even when there are export bans in place, the World Food Programme (WFP) is usually offered a special window within which to export commodities (mostly relief maize) to deficit countries.

There are two main issues that arise with the FRA selling and distribution practices.

1. FRA stock rotation and the disposal of maize is often done at below-market prices and at a time when private traders would like to offload their stored grain to processors. This practice of releasing stocks to selected millers has discouraged investments in private storage. Thus, poor stock rotation and price stabilization practices by the FRA have

impeded the development of a Warehouse Receipts System (WRS), as it is unprofitable to store maize in warehouses for sale later.

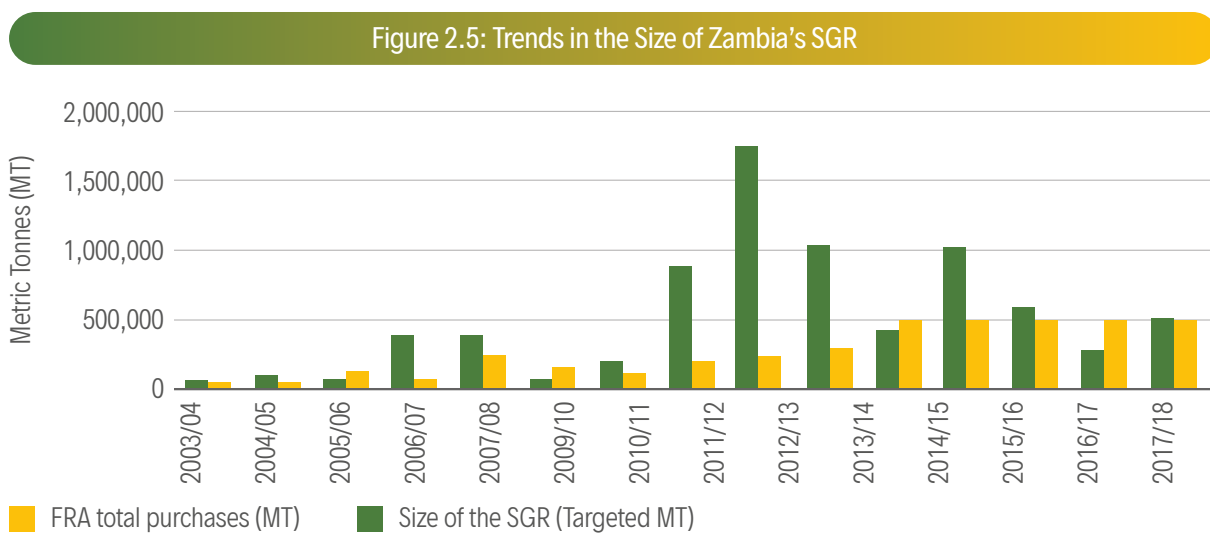
2. The practice of buying high and selling low to selected millers has had minimal effect on lowering consumer retail mealie meal prices. Instead, the subsidy has increased the financial burden of the Treasury at the expense of other equally important social protection programs.

2.7 Food Needs and Implications on the size of SGR

In many years, the size of Zambia’s SGR has been larger than the requirements for SGR purposes (see Figure 2.5), owing to the higher price offered, and to the political economy of maize in the country. For example, in the 2019/20 season, one million metric tons of maize was procured for SGR purposes. This made the FRA the single largest player on the market. Past years also reveal heavy FRA involvement in the market, with the Agency procuring 83 percent of the cumulative 4.4 million metric tons of maize between 2010 and

2012 (Kuteya and Sitko 2013). Any FRA activities to do with maize sales or buying has significant effects on the market.

FRA purchases have also largely exceeded the size of the SGR in election years. Election years i.e. 2006, 2011 and 2016 correspond with the 2006/2007, 2011/2012 and 2015/2016 purchases respectively. In these years, the FRA purchases exceeded the prescribed SGR of 500,000 metric tons (Figure 2.5).



Source: Ministry of Agriculture /Central Statistical Office various years.

One of the biggest challenges confronting the maize market and the management of the SGR is the lack of a rules-based approach in grain marketing. This has created policy inconsistencies discouraging more private sector investments into the maize sector. In the Second National Agricultural Policy, the government committed to the enactment of the 2010 Marketing of Agricultural Products Bill at the recommendation of stakeholders in 2010. This bill, if enacted, would see the creation of an Agricultural Marketing Council (AMC) consisting of the government and

the private sector. The AMC's mandate would be to make decisions on agricultural marketing in the country to create a level playing field for all players and avoid discretionary decisions. The process of enacting this bill has stalled for years, consequently, the marketing of maize concerning the SGR has continued to be discretionary and highly uncertain. Specifically, trade policies (i.e. import/export bans), the ad-hoc setting of the size of the SGR by the government, and inconsistent marketing policies continue to discourage private sector investments in the country.

2.8 Food Emergency Responses and Country-Level Coordination

Food emergency response coordination is co-lead by the Disaster Management and Monitoring Unit (DMMU) under the Vice President's Office and the United Nations resident coordinator (Government of Zambia, 2019). Technical committees under each sector are activated at various levels when needed for the drought response (i.e., district, province) (DMMU/UN/HCT 2019). Annex 2b presents the food emergency response coordination structure.

Typically, the declaration of national disasters is the preserve of Zambia's President following recommendations from the National Disaster Management Council (NDMC).³ As provided for in the Disaster Management Act. No. 13 of 2010,⁴ the NDMC is charged with recommending such an action to the President. Input into this activity follows periodic vulnerability assessments that are conducted by the DMMU. The President has in the past declared national disasters, for example, in 2002, the President declared a national disaster

following droughts that affected production in some districts. More recently, in 2019/2020, the President has not declared national hunger disasters related to food insecurity following severe droughts in the southern half of the country and floods in some areas. This was partly driven by the national availability of the staple food, despite shortages in some areas.

The response to food-related disasters are coordinated by the DMMU. In responding to food crises, the DMMU instructs the FRA to release maize to affected communities through community sales in what is termed a market-based intervention. The DMMU may also purchase maize from the FRA for release to implementing partners such as World Vision Zambia, the WFP, and Adventist Relief Agency. The implementing partners are responsible for the distribution of the maize for relief purposes, while the DMMU only conducts distribution when the response is very urgent. This approach ensures

³ The National Disaster Management Council is made up of part time members appointed by the President: Vice President, Ministers of Defence, Agriculture, Home Affairs, Health, National Planning, Energy, Local government, Communication, Education, Works and Supply, Environment and Natural Resources, Community Development, and Minerals Development (Republic of Zambia, Government of, 2015).

⁴ The Act states that "the council may recommend to the President, the declaration of national disasters" (Republic of Zambia, Government of, 2010)

that the DMMU is free from any accusations of bias in the distribution of relief food. The implementing partners may also add other commodities based on their institutional budgets. These commodities have included pulses, salt and vegetable oil. When the disaster is deemed very big, maize meal is distributed to take away the need for affected households to spend money on milling the maize.

There are a number of issues raised in relation to food emergency response and coordination, including:

1. Storage location in relation to food emergency hotspots impedes the ability of the implementing agencies to effectively respond to emergency needs in disaster-prone areas. This also raises the cost of responding to emergencies as grains are procured from rural areas, stored in urban areas, milled in urban areas, and sent back to these regions for relief purposes.
2. FRA purchases and distributes maize across the country despite differences in the main staple foods across the country. For instance, cassava and rice consuming communities still receive maize for relief purposes.
3. There are logistical challenges related to grain movement that reduce the effectiveness of disaster responses. The DMMU and its implementing partners rely largely on private trucks to ferry relief food from the major FRA storage facilities in the consumption zones to the disaster hotspots. This is problematic as some vehicles on the market may be inappropriate for some terrains. There are challenges around the transportation of relief commodities in the country. The DMMU only has four functional trucks, the ideal situation is to have one truck in each of the 10 provinces. This is because implementing partners sometimes request trucks from the DMMU for hire. Moreover, 4 trucks are inadequate in case of emergency responses that may not be conducted through the usual coordination structures.
4. The FRA draws its resources from the Treasury along with other quasi-government institutions. When the Government has no resources, the FRA cannot effectively respond to changing market conditions.

2.9 Grain Reserves and Synergies with Early Warning Systems

This section largely draws from the DMMU's 2019 response plan (Government of the Republic of Zambia 2019), and interviews with the DMMU and the WFP. The plan explains the early warning system in place to facilitate disaster responses. Both historical and current (annual) data inform decisions.

The DMMU relies on various data sources to inform decisions, some of which complement their data collection (e.g., the CFS and Post-Harvest Survey (PHS)). The major approach to food-related disaster early warning in Zambia involves an number of activities as summarized in Box 2.1 below.

Box 2.1: Zambia SGR Early Warning System

- Rapid assessments are conducted annually to identify needs for a response. Districts for the rapid assessments are selected using information from the Zambia Meteorological Department (ZMD) on areas with below-normal rainfall and information from the District Disaster Management Committee (DDMCs).
- Hydrological data analysis from the Water Resources Management Authority), and the Zambezi River Authority.
- Historical data analysis: Typically, a contingency plan is drawn up before the commencement of each rainy season based on historical data analysis to predict which areas are likely to be affected by droughts or floods. A major observation is that affected districts have remained almost the same, save for a few additions each year.
- Production information from the annual CFS – district and nationally representative survey – conducted by the Ministry of Agriculture between March and April every year. The CFS serves as an early warning system in that the information on anticipated production is used to assess the food security situation in the country and to produce the NFBS. This dataset complements the DMMU’s assessments. However, DMMU’s data collection does not cover all districts.
- In-depth vulnerability and needs assessments are conducted annually building on the rapid assessments, district reports, and the CFS. The vulnerability assessments are used to determine the number of people affected, their geographical areas, and their food and non-food needs. The needs assessment also includes a market assessment that is used to determine the degree to which markets for goods and services are available to meet demand in drought years. This is done bi-annually, first in May/June, and later in October/November (the start of the lean season).
- Reports based on district rainfall performance.
- The PHS, on the other hand, provides actual crop production as opposed to estimates provided by the CFS, this assessment is conducted after harvest (i.e. September – October each year).
- The Southern African Regional Climate Outlook Forum (SARCOF): This is an early warning forecast produced by Southern African Development Community Member States and downscaled to Zambia’s context by the ZMD before the beginning of the season by August. The SARCOF produces medium-range rainfall forecasts that is used to update national contingency plans for the coming season.
- The SGR also feeds into decision-making around grain markets through the stocks monitoring committee meetings/reports. Typically, a few industry players that sit on the stocks monitoring committee (except FRA, which is mandated by law to declare stocks), voluntarily declare how much stocks they have during the year, and this informs government decisions around how much to procure for SGR purposes, relief food responses, and trade policy. These stocks are only for sources that have representation on the stocks monitoring committee (i.e. commercial farmers, grain traders, millers, and the FRA) and thus do not comprehensively capture the maize stocks position in the country (Mulenga et al. 2019).

The current approach to early warning is conducted annually (i.e., around May for the Crop Forecast surveys, October/November for the Post-Harvest surveys, and around April/May for the DMMU’s in-depth vulnerability and needs assessments). However, there is a need for medium-term early warning information generation to help update contingency plans drawn earlier in the season considering new and updated information.

Also, the Post-Harvest surveys are often not carried out due to intermittent funding, sometimes four years pass without a survey. The most recent one was prompted by the 2019 crisis. This was a quick snapshot survey with a smaller sample size than would normally be the case. The main advantage of the PHS is that unlike other production data available (e.g. CFS), it gives a more realistic picture as it accounts for post-harvest losses.

The early warning system is mostly annual (short term) hence, save for the historical data analysis used to plan for disasters, there is a lack of medium-to-long term early warning information generation.

Also, there is lack of a fully operational grain information service to facilitate improved grain information flow for early warning purposes.

The recently registered private sector initiative, Zambia Agricultural Information Services (ZAIS)⁵ lacks the legal mandate to collect information from stakeholders, has no income flow to ensure sustainability, staff positions such as data collectors, data entry staff and accountant are yet to be filled, and the required ICT infrastructure is yet to be installed.

2.10 Reserve Targets Under Different Scenario of Emergency Needs

The Zambian SGR is primarily for emergency purposes within the country. In recent times, the reserve target has been 500,000 metric tons. In the 2019/20 season, the Government announced intentions to purchase 1 million metric tons (almost twice the normal SGR target)—a practice common in years before the elections. However, this pronouncement is also special as the maize is also meant to be a COVID-19 disease contingency plan under the Ministry of Agriculture. Aside from the government agencies, the SGR also serves UN-agencies such as the WFP, and foreign governments (e.g. Malawi and Zimbabwe during the 2015/16 El Niño crisis) for relief purposes, and the private sector for commercial purposes when the need arises. Kuteya and Samboko (2018) argue that the national SGR should range between 150,000 metric tons and 350,000 metric tons. Their calculation is based on the recommended daily caloric intake, social protection level (i.e. percent of the vulnerable population), consumption patterns, and the lead time to imports. At the time of the study, the recommended SGR was 250,000 metric tons. Harman and Chapoto (2017)

recommend a SGR of 300,000 metric tons of maize. However, SGRs are usually a political tool and subject to fluctuation (Ibid). Typically, the SGR is almost double the norm in years leading up to elections. Moreover, the SGR is seldom 500,000 metric tons, instead, the Government still announces that they will buy 500,000 metric tons or more each year, adding what may be in storage during the purchasing period, which increases the actual figure of the SGR held.

Table 2.5 shows the quantity of food that would be required for emergency purposes (and thus the SGR), using population projections for Zambia into 2030 (CSO 2013) the monthly cereal requirement of 12.5 kilogram per person, and assuming 3-6 months of food requirements (which also coincides with the 3-month lead time to imports). We also assume that 20 percent of the population is affected, a higher ratio than the 13 percent worst-case scenario witnessed in the 2019 agricultural season. Since 2012, the second-highest share of the population in need of food was in 2013 at 8.5 percent. In all years listed, results

⁵ ZAIS was incorporated in September 2019 as a body independent from the government. The organisation currently runs on funding from Musika Development Initiatives Limited, a local NGO supporting market development in the country. The owners of ZAIS include the Zambia National Farmers Union (ZNFU), Millers Association of Zambia (MAZ), and the Grain Traders Association of Zambia (GTAZ). A board of directors currently exists, and the organization has made submissions to the Ministry of Agriculture requesting guidance on the legal mandate, and a proposed grain levy to be charged to the ZAIS owners.

indicate that the current 500,000 metric tons SGR size is sufficient for Zambia. The future SGR requirements are almost 70 percent of the size of the current reserves. This suggests that research recommending a 300,000 metric ton reserve target is within the required range (e.g. Kuteya and Samboko 2018; Harman and Chapoto 2017). If we set the requirements at two years, the highest requirement is in 2030 at 699,054.60 metric tons. This means that an SGR of about 700,000 metric

tons would still be sufficient under the same conditions (i.e. number of affected individuals and monthly requirements per person). However, it must also be noted that maintaining SGRs is only one aspect of the government's objective through the FRA. The FRA's smallholder market provision function is also a key determinant of the SGR. In areas underserved by the private sector, FRA maize purchases remain crucial to providing smallholder farmers with a market.

Table 2.5: Zambia's Relief Food Requirements (Worst Case Scenario)

Year	Projected Population (No. of people)	Affected people Assumes 20% of the population (No. of people)	Food Requirements (3 Months)	Food Requirements (6 months)
2019	17,885,422	3,577,084	134,141	174,763.65
2025	20,574,134	4,114,827	154,306	308,612
2030	23,576,214	4,715,243	176,822	353,643

Source: Authors' calculations based on Central Statistical Office data (2013) and Government of the Republic of Zambia (2019).



2.11 Recommendations to Enhance Management of SGR in Zambia

Based on the discussion above, there are three broad recommendations to enhance the management of the SGR in Zambia. These are (i) Reduce the fiscal costs; (ii) Improve the delivery

of emergency assistance; and (iii) support private sector development and collaboration. Details about the specific issues and recommendations are listed in Table 2.6.

Table 2.6 Summary of Key Issues and Recommendations to Enhance the Effectiveness of SGR Management and Emergency Food Responses in Zambia

Issue/Challenge	Recommendation
1. Reduce the fiscal costs	
1.1 Inefficient price stabilization policy	<p>FRA should limit its purchase to only the prescribed SGR stocks and buy these stocks from areas where the private sector is less likely to operate due to remoteness or high transport costs. Also, to create incentives for the farmers to produce the next season's crop, it is important that the FRA becomes the buyer of last resort and guarantees a floor price that is applicable when the farmers fail to get a market or the market price fails to rise above the guaranteed floor price. Therefore, to be a buyer of last resort the FRA should buy at the tail end of the market ensure that it is a buyer of last resort. This would help to limit the Treasury's exposure because the private sector would compete for available stocks and this will help prop up maize market prices. If maize market prices rise above the floor price then the government does not need to honor the floor price. Instead, the FRA could use the commodity exchange to purchase its SGR stocks.</p>
1.2 Inconsistent post-harvest surveys due to financial challenges limit the adequacy of early warning information	<p>Finance the MoA Early Warning Unit to conduct annual post-harvest surveys to help improve data collection and verification of crop forecast surveys. In future, crop forecasts need to be more cost-effective by doing away with the need for a post-harvest survey. This calls for a shift from the survey approach to production estimation in favor of more effective innovations such as remote sensing.</p>
1.3 Disabling policy actions by the FRA on the market due to political interference around SGR management.	<ul style="list-style-type: none"> • Promote partnership between the FRA and the private sector through LuSE/ZAMACE limited and become more efficient in its operations. For example, the FRA can limit the quantity of physical stocks held through partnerships with the private sector. This could limit the fiscal exposure of the government through storage costs and losses. For this relationship to work it is important for government grain marketing policies to be predictable and consistent in order to instill confidence among financial institutions to provide pre-financing facilities. Services offered by ZAMACE if sustained would help to offer viable alternative market services which will help to manage market risks (price volatility). • Expand available market options to include the use of futures market, leveraging the current partnership between LuSE/ZAMACE and Johannesburg Stock Exchange (JSE), can help build an efficient and transparent commodity market for maize and other commodities. The futures market in the form of secured forward contracts (possibly with set margin percentages established by LuSE), would have the secondary advantage for the private sector's liquidity and stable supply challenges, and help normalize expenses and reduce cash flow issues through the payment of advances in an institutionalized setting (thereby reducing their risk), while also reducing their risk of financial loss due to price fluctuations. Additionally, this would be another sustained

Issue/Challenge	Recommendation
	<p>revenue source for government through trade facilitation on the platform while at the same time providing visibility to FRA on available stocks.</p>
<h2>2. Improve the delivery of emergency assistance</h2>	
<p>2.1 Lack of community storage facilities for emergency food storage in disaster hotspots.</p>	<ul style="list-style-type: none"> • Promote community grain banks in the disaster hotspots in line with the WRS development plans. • Set up FRA rural aggregation centers for various commodities close to the drought/flood-prone areas, which are the hot spots for food emergencies. These should be operated in collaboration with private sector players, DMMU and non-state actors such as the WFP, World Vision, among others.
<p>2.2 Disaster hotspots underserved due to skewed distribution of storage facilities across the country.</p>	<ul style="list-style-type: none"> • There is a need to invest in storage facilities and complementary milling infrastructure in the northern half of the country and investments in milling infrastructure are also crucial. The investments can be done using Public-private Partnerships (PPPs). About 895,000 MT in capacity would be needed to match what is currently obtaining in the southern half of the country. In the short to medium term, this may include helping local communities in establishing their own grain banks.
<p>2.3 The lack of comprehensive information on maize stocks in the country to inform maize market decisions.</p>	<ul style="list-style-type: none"> • Enhance stock monitoring capacity and refine parameters used in the vulnerability assessments. • Establish a fully functional and self-sustaining grain information service that could improve decision-making in maize markets to benefit emergency food responses. In particular, ensure the sustainability of ZAIS through the enactment of legislation to allow ZAIS to collect grain levy from its members. This levy would be on all commercial producers and traders of grain, and not the smallholder farmers. As such, buy-in is expected as these are the owners of ZAIS. • Speed up providing ZAIS with the legal mandate to collect data from its members through delegated authority under the Agricultural Statistics Act CAP 229) or the FRA (Food Reserve Act CAP 225). Given that the enactment of legislation for grain levies may take time, it is recommended that ZAIS operations be funded in the very short term.
<p>2.4 Logistical challenges related to grain movement that reduce the effectiveness of disaster responses.</p>	<p>Provide funding to capacitate the DMMU to improve transportation and early warning preparedness. This will involve procurement of trucks, information technology equipment for short to mid-term early warning systems and human capacity building.</p>

Issue/Challenge	Recommendation
<p>2.5 Current relief food provided is nutritionally insensitive – only includes maize and maize products. Inclusion of other commodities is unlikely given cost implications.</p>	<ul style="list-style-type: none"> • Study the possibility of fortifying maize released to millers at time of milling by adding important nutrient elements to the milled maize to help address the malnutrition situation in Zambia. • Include a set target volume of nutrient dense crops, such as Vitamin A biofortified maize (orange maize) in the SGR purchases and relief food distributions.
<p>2.6 Inadequate capacity at the DMMU to conduct more rigorous and informative analyses to improve beneficiary identification and targeting.</p>	<p>Provide training of DMMU staff and relevant members of the Zambia Vulnerability Assessment Committee to conduct more rigorous and informative quantitative and qualitative analysis to improve emergency food beneficiary identification and targeting.</p>
<p>2.7 Finance challenges limiting FRA effectiveness in executing its mandate. The FRA must compete with every other government agency for resources.</p>	<p>The Treasury should establish procedures that ensure that the FRA has ready access to finances to ensure they can better take advantage of evolving market conditions. This follows from international best practices since currently, the agency does not manage its own resources. In ensuring finance availability, care should be taken to not commercialize the FRA.</p>
<p>2.8 High regional demand for maize in deficit countries reducing and unfavorable trade policies stifling effectiveness of emergency food responses.</p>	<p>Current reserve targets are adequate in meeting emergency food needs for Zambia, going into 2030. However, given regional demands for grain from Zimbabwe, Malawi and the Democratic Republic of Congo. There is a need to strengthen cooperation between the countries in vulnerability assessments and trade policy to improve effectiveness of responses across countries.</p>

Issue/Challenge**Recommendation****3. Support private sector development and collaboration**

<p>3.1 Restricted movement of grain across the country in some years undermines the private sector's role in addressing food insecurity.</p>	<p>Promote the private sector's role in addressing food insecurity by always allowing free movement of grain across regions at all times.</p>
<p>3.2 Inefficiencies in the market triggered by FRA actions such as poor timing of stock rotation practices, ad-hoc setting of the SGR size especially in election years and ad-hoc trade policies that undermine emergency food responses within Zambia and for neighboring countries.</p>	<p>Improve the marketing of agricultural commodities by:</p> <ul style="list-style-type: none"> a) Promoting a rules-based marketing system that promotes private sector development and predictability in the maize market in relation to the size of the SGR, timing of stocks rotation, trade policy and inclusivity in release of maize to millers by the government. This can be enhanced by the enactment of the Agricultural Marketing Bill. b) Decentralizing market assistance at the sub-national level through the operationalization of marketing boards.



PART 3

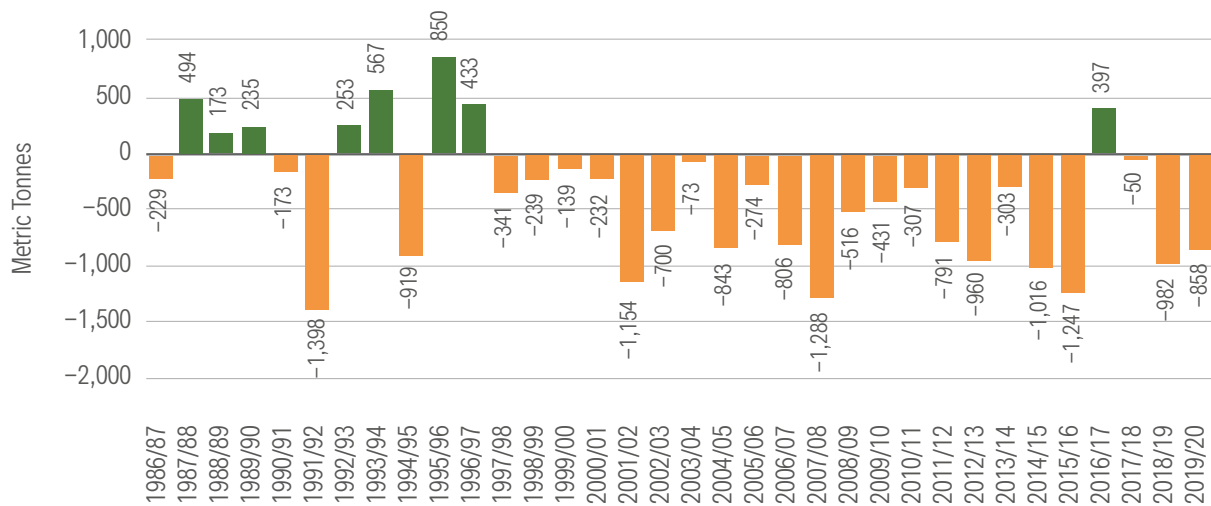
FOOD SECURITY AND STRATEGIC GRAIN RESERVES IN ZIMBABWE

3.1 Overview of Food Security Situation in Zimbabwe

Zimbabwe is one of the food insecurity hotspots in Sub Saharan Africa. The country has been facing food emergencies caused by El Niño-induced droughts and the devastating effects of a series of cyclones –Cyclone Eline in 2000, Japhet in 2003 and Idai in 2019. Figure 3.1 shows that since 1996, the country has had

continuous maize deficits with the exception of 2016/2017 and 2020/2021, mainly attributed to more frequent droughts and generally low maize productivity. The country used to experience a drought at least every 5 years, but these have now increased in frequency, occurring every other year or every year in recent periods.

Figure 3.1: Zimbabwe: Trends in Maize Surplus/Deficit (1986/87–2019/20)



Source: Zimbabwe National Food Balance Sheets.

The increasing weather risks and the recurrent grain deficit has resulted in an increase in the proportion of the population requiring food assistance. In all the drought years, the country had severe food deficits, where in some years over 5 million people (nearly 40 percent of the population) were reported to be food insecure and requiring emergency food assistance. In these years the government had to declare national food emergency in order to receive support from both local and international partners. The advent of the COVID-19 pandemic in March 2019 has induced additional food emergencies due to supply chain disruption.

The proportion of the population requiring food assistance is correlated with the previous harvest, thus a shortfall in the previous season results in

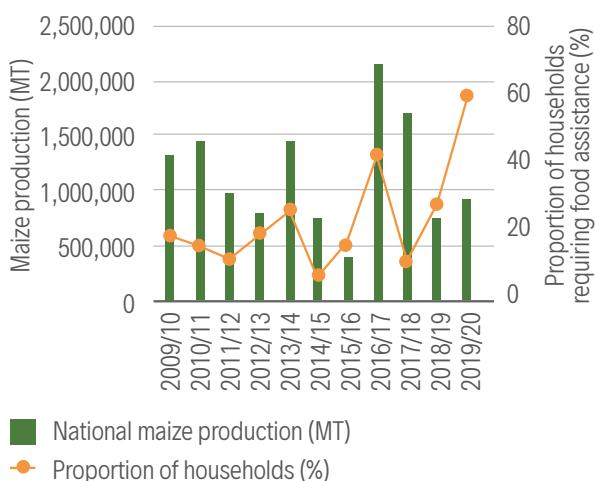
a huge jump in the number of people requiring food assistance in the following year (see figures 3.2). However, it is also very important to note that the amount of food assistance available is dependent on the time of the year. In general, the food assistance requirements decrease soon after harvest and increase as the marketing season progresses and peaks between January and March (see figure 3.3). Also, the trend shows that over time the proportion of households requiring food assistance has increased due to the more frequent maize grain production shortfalls.

In addition, the country faces a huge burden of micronutrient deficiencies. Anemia and Vitamin A deficiencies affect 31.5 percent and 21.2 percent of children under five years respectively, while

23.9 percent of women are deficient in Vitamin A and 25.8 percent of women are anemic. The government of Zimbabwe recognizes that agriculture is one of the key priority sectors in achieving sustainable economic growth, poverty

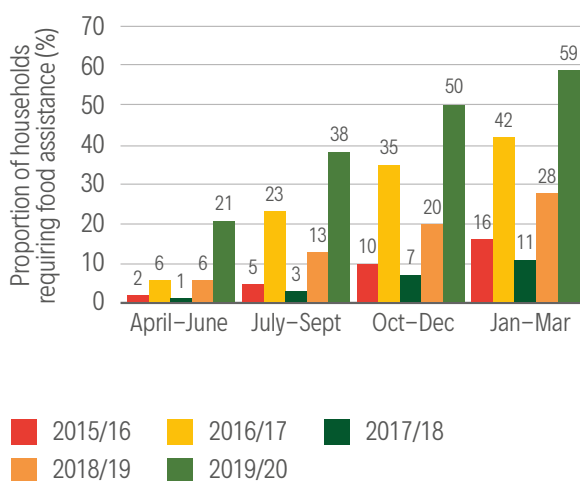
reduction and food and nutrition security. However, frequent droughts plus limited resilience, inadequate resource allocation to key drivers of agriculture growth make it difficult to achieve the stated goals.

Figure 3.2: Maize production and proportion of households requiring food assistance, 2009–2020



Source: Maize production figures from MLAFWRR and proportion of households computed from ZIMVAC reports

Figure 3.3: Proportion of Households Requiring Food Distribution By Quarter: 2015 – 2020



Source: Author’s computation based on ZIMVAC reports

The government has used various approaches to address food emergency needs with Strategic Grain Reserves (SGR) being the main instrument (see table 3.1). The effectiveness of these approaches has been mixed but in general the prominent goal of the government has been to ensure food security by supporting

maize production and use of the SGR. The SGR has been used to stabilize domestic prices by providing maize to millers at subsidized prices and provide incentives to producers through direct procurement at above market prices with a motive of increasing their incomes and encourage maize production.



Table 3.1: Food relief responses during years declared national disaster

Interventions	Period/s	Food Emergency Responses Implemented	Storage shed located in rural areas (%)
Food/cash transfers	1995	Free Food Program	<ul style="list-style-type: none"> Is estimated to benefit about 733,000 people. Number of beneficiaries were lower than those in need Delays in distribution
	2019–2020	Distribution of food and cash transfers targeting vulnerable groups in both urban and rural areas.	<ul style="list-style-type: none"> Selection of beneficiaries for in-kind food transfer not transparent. While there is poor targeting in the Harmonized Cash Transfer (HCT) due to the use of an outdated (2012) beneficiary list to inform targeting in recent years.
		<ul style="list-style-type: none"> Monthly food assistance through cash or in-kind transfers to food insecure households in collaboration with local stakeholders for the period April – June 2020. 	<ul style="list-style-type: none"> Food relief efforts inadequate as over 5 million people were in need. Some notable delays in distribution
Food subsidies	2019–2020	Introduced unrefined maize meal (roller meal) subsidy targeting the vulnerable groups.	<ul style="list-style-type: none"> Inadequate as only a few are accessing Hoarding of subsidized mealie-meal for resale on black market.
Feeding programs	1995	Supplementary Feeding Program	<ul style="list-style-type: none"> An estimated 800,000 children benefited.
	2016	Micro-nutrient / under five feeding program School feeding program; Support the provision of school meals in all districts	
	2019–2020	Procure and distribute nutrition commodities for treatment of severe acute malnutrition, prevention and treatment of moderate, acute malnutrition in children 6 – 59 months and acute malnutrition in pregnant and lactating women.	<ul style="list-style-type: none"> Program affected by COVID-19 restrictions
Grain loan	1995	Grain Loan Scheme.	<ul style="list-style-type: none"> Estimated to have benefited some 5.05 million Zimbabweans. Repayment was poor.

Source: Authors' compilation (2020).

3.2 Management of the SGR

The severe droughts experienced during the 1991/92 and 1994/95 agricultural seasons persuaded the Government of Zimbabwe that it needed to have a SGR to effectively deal with any future drought- induced food supply shortages and emergencies. Through a Debt Take-over Agreement (DTA)⁶ signed between the Grain Marketing Board (GMB) and the Government of Zimbabwe in 1996, the country started holding food reserves. Since then, the GMB has a mandate to maintain the 500,000 MT of physical stock. The GMB is a corporate body established pursuant to the Grain Marketing Act [Chapter 18:14] and its key role is management of the Strategic Grain Reserve through its extensive grain crop storage silos and bag depots situated across the grain farming areas as well as major consumption areas within the country's 10 provinces. In addition, the GMB is mandated to be a grain buyer of last resort as well as have the responsibility of managing the Government Initiated Inputs Schemes.

The policy environment under which the GMB operated has evolved over time. In February 2009, the Ministry of Finance announced the liberalization of the grain marketing system where the GMB was mandated to announce the floor prices related to import parity and while assuming the role of buyer of last resort, reverting to 1996 reforms. This marketing arrangement was succeeded by SI 122 of 2014, introducing Minimum Grain Producers Prices (MGPP) allowing farmer's choice to sell either to the GMB or private traders. This was done in order to encourage farmers to continue to produce grain and sell to

the GMB which offered the minimum viable price, as the buyer of last resort, while private traders could offer higher prices, as buyers of first choice.

In 2019 at the peak of food emergency crisis a total of 59 percent of the country's population was food insecure and maize deficit estimated at 206,250 MT, the Government introduced a regulation (SI 145 of 2019), which prohibited exports of maize and banned individuals, statutory bodies or companies from buying maize directly from producers except GMB and registered private contractors including Delta, PHI Commodities, Staywell Trading and Northern Farming. Registered contractors were allowed to purchase from their contracted growers only and GMB was declared the sole buyer of maize from all the farmers outside outgrower contracts (Government of Zimbabwe 2019).

The impact of SI 145 in terms of improving grain inflows still needs to be evaluated but indications point to the same results experienced under SI 235A in 2001, which led to the suspension of all agricultural trading by the Zimbabwe Agriculture Commodity Exchange (ZIMACE). At that time, private sector firms that had been purchasing grain directly from farmers stopped buying, which created cash flow issues to maize surplus households. Rendering private trade illegal meant maize trading in particular went 'underground' resulting in sharp price increases due to the risk premium associated with the illegal trading. The rising inflation and rapid erosion of the currency at that time meant that farmers with a surplus preferred to withhold their

⁶ Under the DTA, the government mandated the GMB to continue its grain and associated products trade business on a commercial basis and handle the SGR for the nation as an agent. The Government assumed all prior GMB debts to allow it to operate viably. The Government made a commitment to create a fund to be managed by the Board on its behalf for the purpose of financing the procurement and management of the SGR that will range between 500,000 metric tons to 936,000 metric tons per year (Government of Zimbabwe, 1996). The DTA gave the GMB flexibility to determine its own pricing and marketing policy to avoid losses from its commercial operations and achieve profit and return on capital employed.

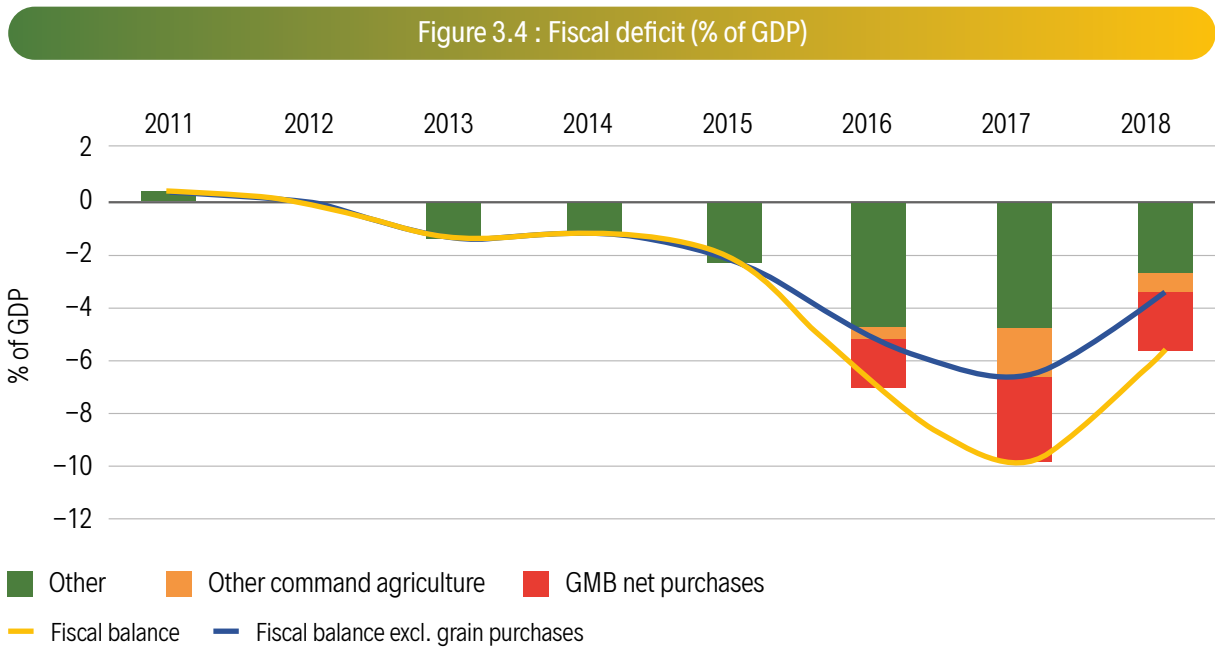
commodity than sell it to GMB at a lower price which was against GMB’s monopoly objectives. The impact of the current grain market control policy is much worse due to a combination of several factors including the quoting of prices in local currency in a hyperinflation environment and farmers failing to buy inputs for the next season due to inflation. Similarly, in the 2020/2021

marketing season farmers withheld their maize, preferring to illegally trade directly with millers at prices ranging between US\$ 270 to US\$ 280 per metric ton, while the GMB fixed price was US\$ 265 per metric ton. The GMB only managed to purchase 150 000 metric tons by the end of November 2020 against an initial projected target of 500 000 metric tons.

3.3 The fiscal cost of SGR Management

The fiscal cost of funding the SGR interventions is very high and unsustainable. In 2018, grain purchases by the Grain Marketing Board were US\$ 473 million or about 3.4 percent of GDP and the difference between the procurement and sales

prices amount to about US\$ 285 million or about 2.1 percent of GDP.⁷ The cost of such interventions was considerable as a share of government expenditure and GDP, creating a significant impact on the fiscal deficit (see figure below).



Source: Zimbabwe Agriculture Public Expenditure Review (WBG 2019).

A recent assessment indicated that the Government would require nearly US\$ 470 million (more than the total budget allocated for agriculture in 2019/20 2020) of which 18 percent goes toward subsidizing maize supply

to industrial processors. Besides grain purchases and sales, there are other major drivers of costs related to transportation of grain from surplus to deficient areas, bagging operations, maintenance of storage infrastructure,

⁷ World Bank 2019. Agriculture Subsidies for Better Outcomes: Options for Zimbabwe. Internal Discussion Paper.

fumigation and handling. The costs related to GMB operations are directly related to the quantity of grain handled in a particular season. For example, the Treasury spent between US\$ 145 million and US\$ 900 million annually in the

2012/2013 and 2017/2018 marketing seasons respectively – with the highest expenditure in the later period associated with a significant increase in the amount of grain reserved, which was more than 1.2 million metric tons.

Table 3.2: SGR Budget Allocation, Maize Production, SGR Purchases and GMB Buying and Selling, 2012 to 2020

Marketing Year	Total Allocation to MLAFWRR (US\$ millions)	Budget Allocation to SGR (US\$ millions)	Actual SGR Expenditure (US\$ millions)	% MLAFWRR Budget Allocated to SGR	National Maize Output (metric tons)	GMB Purchases (metric tons)	Transport Costs (US\$)	GMB Buying Price	GMB Selling price
	A	B	C	D= (B/A)	E	F	G	H	I
2012/13	147.00	30.0	89.4	20.4%	968,000	81,190	966,322	285	–
2013/14	155.00	36.0	33.8	23.2%	798,596	33,273	2,302,923	310	–
2014/15	161.00	41.0	19.4	25.5%	1,456,153	220,366	3,957,650	390	462
2015/16	173.00	46.0	379.6	26.6%	742,225	67,945	4,107,590	390	462
2016/17**	225.15	48.08	393.62	21.4%	511,816	217,726	17,147,062	390	445
2017/18**	248.69	56.50	204.00	22.7%	2,155,526	1,209,998	33,463,258	390	270
2018/19**	116.39	27.65	174.04	23.8%	776,635	1,209,998	–	390	250
2019/20**	221.38	100.47	N/A*	45.5%	907,629	1,149,117	–	240	–

Source: MOFED and MLAFWRR (Various Years), GMB Annual Reports (various years)

B Capital contribution relates to funds advanced to the Grain Marketing Board by the Treasury for the purchase of grains and payment of related expenses

C Unaudited Expenditure outturn figures provided by MOFED not verified by the Auditor General's Office

H announced Producer prices at which the government through the GMB is buying maize from farmers

I Prices at which the GMB sells maize to millers

– Figures missing

*actual expenditure figure for 2020 not yet finalized by time of compilation of report

**Budget Figures between 2017 and 2020 converted to US\$ using annual average exchange rates of 1US\$ = 1.3 ZWL (2017); 1 US\$= 2 ZWL (2018); 1US\$ =8.5 ZWL (2019)⁸ and 1US\$= 51.3 ZWL (2020; RBZ)

The scaling of government control over grain markets following regulation making GMB the sole buyer of maize, has further increased the fiscal burden of the government's grain reserves operations, destabilizes private sector participation in grain markets and diverts scarce public resources from investing in long-term agricultural productivity and resilience. As table 3.2 shows, a bulk of expenditure for agriculture

goes toward grain reserve interventions than to investments that can directly enhance agricultural productivity and resilience in the long term. Despite massive public spending on grain reserves both at producer and consumer points there is little evidence on the economic gains of such spending and contribution to food security. A set of reforms will be needed to reduce the fiscal cost of grain reserve

⁸ Zimbabwe 2019 Article IV Consultation, International Monetary Fund; <https://www.imf.org/-/media/Files/Publications/CR/2020/English/1ZWEEA2020001.ashx>

management and ensure the effectiveness of its operations to achieve the desired economic gains and contribution to food security.

The following sections provide a review of the SGR management and operations and identify main issues for reform consideration.

3.4 Strategic Reserves Facilities and Location

Grain storage in Zimbabwe is done at local and national levels involving private and public players. It is common in the Zimbabwean farming sectors to store grain at household level to ensure food availability for the family throughout the year given the seasonality of production. Millers in the country handle about 500,000 MT of grain in good years through their combined private storage capacity of 100,000 MT such that at business peak, they will require leased storage space.

GMB has at least one depot in every district⁹ and all depots are located relative to grain production and strategic grain distribution centers. The GMB storage infrastructure covers 86 sites countrywide with up to a storage capacity of 2,813,000 metric tons. This storage capacity is made up of 736,500 metric tons of silo storage, 124 608 metric tons sheds, 1,272,489 MT hard stands, and 679 500 metric tons compacted ground. The GMB owns 12 silo complexes in Banket, Concession, Aspindale,

Lions Den, Bulawayo, Chegutu, Norton, Karoi, Murehwa, Magunje, Chiweshe, and Mukwichi.

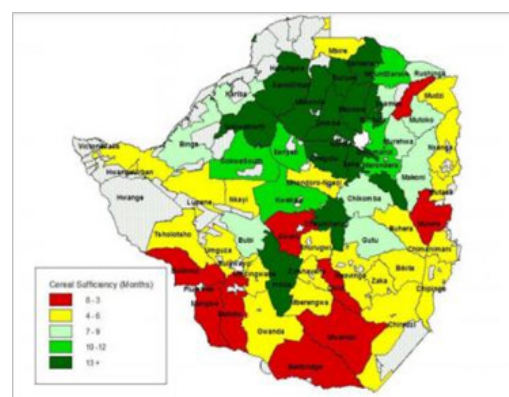
Figures 3.4 and 3.5 show the GMB depot network throughout the country and cereal sufficiency status in Zimbabwe to illustrate hotspots for food insecurity/security in the country. These maps show a high concentration of silo network in food production hotspots of Mashonaland Central and Mashonaland West Provinces while other storage facilities such as hard stands and sheds are in grain deficit areas to facilitate storage during distribution. A total of 22 depots are served by a rail network, an important key factor for grain distribution during distress periods and delivery into depots by local farmers and importers. Some depots in drier regions of the country like Matebeleland South, Matebeleland North, Masvingo and parts of Mashonaland East and Manicaland were established primarily as maize distribution centers and have fewer farmers that produce surplus grain for markets.

Figure 3.5: GMB Depot Network in Zimbabwe



Source: GMB.

Figure 3.6: Cereal (maize and small grains) sufficiency



Source: Second Round Crop and Livestock Assessment Report 2019/2020 Season.

⁹ Zimbabwe has 59 districts.

Only 26 percent of GMB storage facilities consist of durable infrastructure. The GMB has silo depots which are made from concrete, two made from metal and the rest of the depots are hard stands. These require different levels of maintenance and rehabilitation. The silo plants are in need of rehabilitation in terms of waterproofing on joints and basements. The GMB, in February 2021, floated a tender to address the same. The silos also require automation by way of installing sensors to manage grain moisture content and pest regimes in the storage facilities. Modern silos installed with computerized systems to manage grain intake and conveyance systems are required. Automation of GMB silos will improve efficiencies in grain storage and handling while reducing grain losses. Over the last five years the GMB has managed to keep grain losses below 3 percent annually.

In terms of adequacy of the storage facilities, it was noted that more depots are needed in high potential marginalized areas to allow the

GMB to buy and store as a buyer of last resort. Mashonaland West Province is endowed with the largest number of silo and bag depots, however, there is still a gap in terms of storage capacity in remote locations. Mashonaland West is the hub of maize farming. The storage capacity in the province of about 230,000 metric tons is inadequate to accommodate both maize and wheat intake in one season. Stakeholders indicated that it was prudent to invest in two other bulk handling depots or facilities in the Mhangura and Raffingora areas.

In addition, in the southern parts of the country where food relief needs are high, depots are widely spaced with households travelling more than 200 km to collect food in times of need. This results in distribution hassles and beneficiaries failing to access food relief when needed. In general, the increased capacity in remote locations will allow the GMB to lease existing silos in more accessible locations.

3.5 Grain Buying Modalities

The government through the GMB prefers to source maize for the SGR from the local market using agreed grading standards as incentives to farmers to produce by availing conformed markets for the commodity and as well as buying at favorable prices. The GMB purchases grain directly from farmers who deliver to its collection depots across the country.

The MLAFWRR after approval by the Cabinet announces producer prices at which the GMB would buy maize from farmers during the marketing season that starts on April 1 of each year. In 2020, the government adopted the strategy of announcing indicative pre-planting prices to provide certainty to farmers wishing to produce maize. Unfortunately, this poses several challenges. First, a very high pre-planting price will likely increase the financial burden on the

already stretched Treasury as the GMB is the sole buyer of all non-contracted maize under the SI 145 statutory instrument. Second, the region and indeed Zimbabwe is projected to produce a huge crop due to favorable weather conditions coupled with a massive government input distribution program during the 2020/21 agricultural season, a situation likely to create marketing challenges as market prices are projected to crash and there will be limited export opportunities in the region. This means the country has to store a large portion of the harvest. The expected bumper harvest of more than 3 million metric tons requires that the Government secures huge resources to enable the GMB to purchase grain at the promised pre-planting price. Any payment less than the promised price will meet resistance from the farmers, a situation that can affect future grain production.

It is commendable that the government is considering the GMB participation in the Warehouse receipts System and Commodity Exchange, a space that can crowd in private sector financing of the SGR. However, this would require the repeal of SI 145. The current situation where the GMB carries all the cost to procure, store and distribute grain to the private sector who would otherwise finance their local procurement and storage is overburdening the Treasury. A repeal of SI 145 would help to unlock private sector financial resources for grain purchases or imports instead of creating an artificial demand for subsidized maize from the GMB.

During the buying season, the GMB submits weekly returns of grains purchased to the Treasury to trigger the release of cash to pay farmers. Purchases are conducted through the GMB's depots or established and mobile collection points. Collection points aggregate grain from the farmers for onward movement into main depots. The requisite processes between GMB and the Government authorities availing funding for grain purchases results in delays in payments to farmers and high transaction costs that discourage participation of smallholder farmers.

Another issue that was raised involves the pan-territorial pricing policy itself. Thus, GMB pricing policy does not consider silo discounts as they have one price throughout the country. The pricing policy, has implications on the operation of private sector players who have to incur varying transport costs depending on their distance from the nearest collection point.

In the 2016/17 agricultural season, the government of Zimbabwe, with the desire to become self-sufficient and a regional grain bread basket introduced the Special Maize Production Programme (SMPP) for Import Substitution or Command Agriculture.¹⁰ This program came with a guaranteed producer price of US\$390/metric ton calculated based on cost of production and average yields was set well above the prevailing market price. While the price was favorable to the farmer and motivated farmers to increase the hectareage under maize, the above market price resulted in other unintended effects. For example, the contracted producer maize price of \$390/metric ton was at variance with the regional and domestic supply and demand position. This created arbitrage opportunities in the local maize market by making informal maize imports more lucrative given that there was an import ban in place. Inevitably this increased the cost of policing the bans and an increase in discretionary funding to support consumer subsidies through the GMB sales of subsidized maize grain to millers.

The producer pricing policy was revised during the 2019/20 marketing season to a production cost plus profit producer pricing model and benchmarked to the import parity prices prevailing at the time of price announcement and to be paid in Real Time Gross Settlement (RTGS) \$. The pricing in RTGS\$ was met with fierce resistance from farmers who felt that the price was not reflective of the real cost of production in 2018/19 agricultural season as it ignored the prevailing exchange rate volatility.

¹⁰ Command agriculture – a special import substitution program initially targeting production of maize and now including wheat, soybeans, cotton, livestock, fisheries, forestry – is an intended private-sector-backed input and price support program implemented by the Government of Zimbabwe through joint command structure. Under the program, all beneficiaries (including all farm sectors – communal, old resettlement, A1, small-scale and A2, irrigation schemes and institutions such as Mission and Church farms, Universities, Colleges, Schools, Police and Prison Services and Zimbabwe Defence Forces) are contracted to deliver a specified quantity to a specified government agency (Grain Marketing Board, GMB) after harvest as a repayment for support rendered. In turn the recipients who sign up receive fertilizers, seed, agro-chemicals and irrigation and mechanized equipment on a cost-recovery basis. In addition, the Presidential Input Scheme targets vulnerable households who receive a free standard package of seed and fertilizer for maize and cotton.

Benchmarking the maize price on import parity pricing was the correct decision as the country was in a grain deficit situation. However, the decision to fix the price based on the RTGS rate on the day of announcement and not allowing it

to fluctuate removed the incentives for farmers and traders to participate in the market actively. Table 3.3 demonstrates how the revised maize prices were quickly eroded by the depreciating Interbank market RTGS \$ to US\$ rate.

Table 3.3: Maize producer prices – RTGS converted to US\$ at Interbank rates

Date	RTGS \$: 1 US\$	Maize price in RTGS\$			
		390.0	776.0	1400.0	2100.0
15-Mar-19	2.75	141.8			
30-Mar-19	3.01	129.6			
02-Apr-19	3.00	130.0	258.67		
14-Apr-19	3.16		245.57		
30-Apr-19	3.26		238.04		
02-May-19	3.26		238.04		
14-May-19	3.37		230.27		
30-May-19	5.23		148.37		
12-Jun-19	5.50		141.09	254.55	
14-Jun-19	6.00			233.33	
30-Jun-19	6.62			211.48	
02-Jul-19	7.80			179.49	
10-Jul-19	8.67			161.48	
11-Jul-19	8.71			160.73	
16-Jul-19	8.52			164.32	246.48
17-Jul-19	8.84				237.56
18-Jul-19	8.85				237.29
19-Jul-19	8.86				237.02

Maize grain US\$ price as at RTGS Interbank rate

Source: Adopted from Chapoto et al, 2020.

This situation resulted into increased demand for cheap maize grain from GMB by millers and created grain allocation nightmares for the government as well as increased arbitrage opportunities for well-connected individuals or entities. This situation increases the burden to the Treasury. In

compliance with the SI 142 instrument of 2019, the recommendation is that farmers should be paid RTGS dollar equivalent to the real US\$ import parity price using the daily official interbank exchange rate instead of fixing it at the RTGS rate on the date when the price is announced.

3.6 Reserve Selling and Distribution Mechanisms

Zimbabwe used grain reserves for three main objectives - (i) price stabilization; (ii) food; and (iii) sales to rural households. The utilization or release of the reserves and pricing of procurement and sales is decided by the Cabinet based on recommendations from MLAFWRR.

1. **Price stabilization:** The reserve is maintained where GMB historically buys most of the maize from farmers at higher than import parity prices and sells it to processors at cost plus margin during normal seasons and at subsidized prices during food crisis periods as a consumer price stabilization strategy. For example, during the 2020/21 marketing season, the GMB was buying maize at Zimbabwean Dollar (ZWL) 21,000/metric ton and releasing it to millers at ZWL 12,330, constituting a 41.3 percent subsidy. This level of subsidy was generally higher than given in previous years, averaging 33 percent per metric ton.
2. **Food emergency:** Based on the results of annual vulnerability assessment (ZIMVAC) the GMB holds stocks for distribution to chronically food insecure households through the government Department of Social Welfare during the the periods July – September and October – December of the year of assessment, and January – March and April – June of the following year. The MLAFWRR communicates to GMB the Cabinet-approved grain distribution requirements for social welfare needs across all districts. The Department of Social Welfare at the district or ward level approaches the nearest allocated depot¹¹ with a release order. After checking the release order, the GMB

releases the stated monthly allocation to the Food Distribution Committee(s) which are led by District Social Welfare Officers. The GMB raises an invoice for the quantity of maize released for payment by Department of Social Welfare. Although the country has a robust food emergency coordination structure it takes not less than a month from the date a request or application for food assistance is submitted and final approval of the request by Cabinet (see Annex 3b). There is a need to set or put in place self-triggering thresholds to ensure local authorities do not always go back to Cabinet for approval. In addition actual payment for the grain is in most cases a challenge as the Treasury takes time to release the resources for the payment of the grain. This strains GMB financially. GMB should always have resources to cover social welfare needs and acquit the resources on a quarterly basis or after every six months. Logistical arrangements for the transportation of the grain is usually a challenge as affected households are required to fund transport costs to the nearest distribution center or travel long distances to GMB depots. There is a need to have GMB structures at lowest administrative levels to ensure ease access of households by food service providers.

3. **Sales to rural households who do not fall under the vulnerable group category on a cost recovery basis:** Grain can be accessed through the GMB depots or it is moved closer to the people at ward centers that serve as selling points. The GMB sells grain to these households at breakeven price. This is meant to curb people reselling the grain back to the GMB. The Government meets the costs of

¹¹ All wards or districts are allocated depots from which they collect their allocations.

transportation, handling and storage before it is sold to the households. The GMB estimated this category of sales to be less than 5 percent of total maize sales for the year in previous

seasons. In the 2020/21 marketing season, GMB discontinued these sales to focus on distribution of maize to vulnerable groups through the Department of Social Welfare.

3.7 Emergency Food Needs and Implications on the Size of SGR

The national annual cereal requirement is estimated at over 2 million metric tons (2,115,837 metric tons to be exact). This calculation is based on the country's population and per capita requirement of 120 kilogram/person/year and 450,000 metric ton cereal requirements for the stock feed industry (MLAWRR Crop and Livestock Report, 2020). The bulk of the 120 kilogram/person/year is composed of maize grain, however, the cereal basket also includes 13 kilogram of traditional grains, 28 kilogram of wheat and 1 kilogram of rice per year. Based on these estimates, the annual maize requirements alone is estimated at 1,532,794 metric tons.

As was shown in Figure 3.1 in the overview section and Table 3.4, the country has not been producing enough to meet the human consumption and the stock feed industry requirements. Also, in most of the years the SGR was less than the prescribed 500,000 metric tons even with imports. While the grain reserves are below the required level of 500 000 metric tons as at April 31 of each season, they are above the food needs for food insecure people at peak hunger season except for 2009/10, 2010/11, 2014/15 and 2016/17. These include the elderly, who are currently estimated at 2 percent of the total population, the disabled, pregnant women and children from poor households. However, the SGR in Zimbabwe is not designed to address the micro-nutrient deficiency in special groups such as children, pregnant women and the elderly (see Box 3.2).

According to discussions with the GMB, the current lead time to get imports into the country is close to six (6) months. This long lead time is due to the logistic procedures required to import grain in the country and this has largely been contributed by inefficiencies and the need to comply with set procedures and processes when it comes to the procurement. For example, during a bad season such as the one in 2019/20, where according to the Zimbabwe Vulnerability Assessment Committee (ZIMVAC) report of 2020, close to 8.3 million people required food relief. The country needed about 319,424 metric tons of physical maize reserves as well as financial reserves to allow for procurement/importation of the same amount to cover the whole year.



Table 3.4: National Production, GMB Stocks, Imports, Disbursements to Social Welfare, Millers and Local Sales and Food Needs, 2009–2020

Year	National Production (MT)	GMB Opening Stock	GMB Intake	GMB Imports	Inflows into Grain Reserve	Disbursements to Social Welfare	Millers/ Local Sales	No of People Food Insecure at Peak Hunger Period	Food Needs (MT) at Peak Hunger Period
	A	B	C	D	E = B+C+D	F	G	H	I
2009/10	1328	531	63,459	417,825	481,815	58,976	382,774	1,600,000	60,000
2010/11	1452	40,065	241,702	3,580	285,347	5,326	15,646	1,300,000	48,750
2011/12	968	264,375	212,622	0	476,997	3,129	175,254	1,026,000	38,475
2012/13	799	298,614	81,190	0	379,804	9,365	227,991	1,668,000	62,550
2013/14	1456	142,448	33,273	18,888	194,609	1,544	189,810	2,194,737	82,303
2014/15	742	3,255	220,366	0	223,621	243	75,476	538,849	20,207
2015/16	512	147,902	67,825	67,132	282,859	64,691	139,147	1,530,326	57,387
2016/17	2156	79,021	217,726	500,989	797,736	355,405	241,423	2,934,377	110,039
2017/18	1709	200,908	1,209,998	110,420	1,521,326	146,680	552,916	1,075,938	40,348
2018/19	777	821,730	1,149,117		1,970,847	308,570	969,375	2,869,517	107,607
2019/20	901	692,902	261,173	154,024	1,108,099	251,942	784,357	5,500,000	206,250

Source: MLAFWRR various years.

Box 3.1: Integrating Nutritionally-Enhanced Maize in National Procurement: Zimbabwe

Access to nutritious food is a key pillar of food security. The Strategic Grain Reserve (SGR) plays a critical role in ensuring food security by distributing food to the poorest regions during lean seasons or at times of economic shocks. The nutritional sensitivity of the Strategic Grain Reserve can be increased through the inclusion of nutrient dense crops, such as Vitamin A biofortified maize (orange maize).

Zimbabwe bears a significant burden of disease due to “hidden hunger” or micronutrient deficiencies. In-country studies done have shown that in children ages 6 to 59 months, one in four have Vitamin A deficiency, about 72 percent are living with iron deficiency, while one in three have iron deficiency anemia (see <https://www.unicef.org/zimbabwe/nutrition>). In women of reproductive age one in four have Vitamin A deficiency and nearly 60 percent are iron deficient while 26 percent are anemic. Vitamin A deficiency lowers immunity, impairs vision, and may lead to blindness and even death. Iron deficiency impairs mental development and learning capacity, increases fatigue, and can increase the risk of women dying in childbirth. Inadequate zinc

intake can cause stunting and increases children’s risk for diarrhea and pneumonia. While daily diets should be the principal source of micronutrients, nearly 80 percent of Zimbabwe’s population cannot afford a healthy, diverse diet and nearly 58 percent cannot afford a basic nutritious diet (SOFI, 2020).

Staples like biofortified orange maize are an affordable source for micronutrients. Biofortified crops have the potential to dramatically improve micronutrient deficiencies. HarvestPlus in partnership with national agriculture research institutes, private sector and country governments identifies locally preferred, high-yielding and drought-tolerant varieties and enriches these with iron, zinc or Vitamin A by using conventional (non-GMO) methods. Zimbabwe’s Department of Research and Specialist Services has released five varieties of Vitamin A-fortified maize which are then licensed to private seed companies to produce seed for sale to farmers. HarvestPlus also supports forward linkages with grain off-takers and processors. To date, 45 million consumers globally and more than 1.6 million consumers in Zimbabwe, are benefiting from

nutritious staples such as Vitamin A-enhanced maize, high iron beans, and other biofortified crops. Farmers adopt these crops not only for their taste and nutritive value but also for improved productivity and better economic return under drought conditions. There is a growing body of peer-reviewed publications on the efficacy of Vitamin A maize in improving not only Vitamin A status but also health outcomes. Monitoring surveys have reflected strong uptake of orange maize seed by farmers and equitable daily consumption by all household members. Meenakshi et al. (2010) showed that biofortification is highly cost-effective and estimates that every dollar invested can yield an average of US\$ 17 returns in benefits.

There has been strong policy support for biofortification in Zimbabwe, shown through its inclusion in the Zimbabwe National Nutrition Strategy, (2014 –2018), the Zimbabwe National Food Fortification Strategy (2014 – 2018), the food and nutrition security policy and the draft

National Agriculture Policy Framework (2019–2030). Biofortification is integrated and tracked through the Ministry of Agriculture, Lands Resettlement and Climate Change annual National Agricultural Survey. Given that biofortification is a nutrition sensitive agriculture intervention, complementary agriculture and safety nets policy reforms can play a significant role in its scaling.

Vitamin A-enhanced maize delivered through the SGR can significantly address food challenges, including nutritional security. The procurement of specific targets of orange maize for the SGR and its subsequent distributing as food aid to the poorest regions can play a critical role in addressing persistent hidden hunger. Official procurement targets would encourage private sector participation in the biofortified maize value chain and complementary support for farmers (such as a short-term working capital facility for nutritionally-enhanced crops) can help motivate adoption of nutritionally enhanced maize varieties.

Source: Sakile Kudita, Rewa Misra, Ekin Birol (HarvestPlus 04/21/2021).



Table 3.3 shows that the GMB is handling more grain for millers than for social protection and food security (compare Columns F and G). However, there is evidence suggesting that the subsidy passed through millers does not translate to a reduction in the cost of grain for the rural or urban consumers as it is open to all.¹² For example, during the 2019/2020 marketing season the customer price of ZWL 70 per 10 kilogram bag against a market price of ZWL 136.9/10 kilogram and higher created arbitrage opportunities for millers, merchants and well-to-do consumers. The Ministry of Industry and Commerce

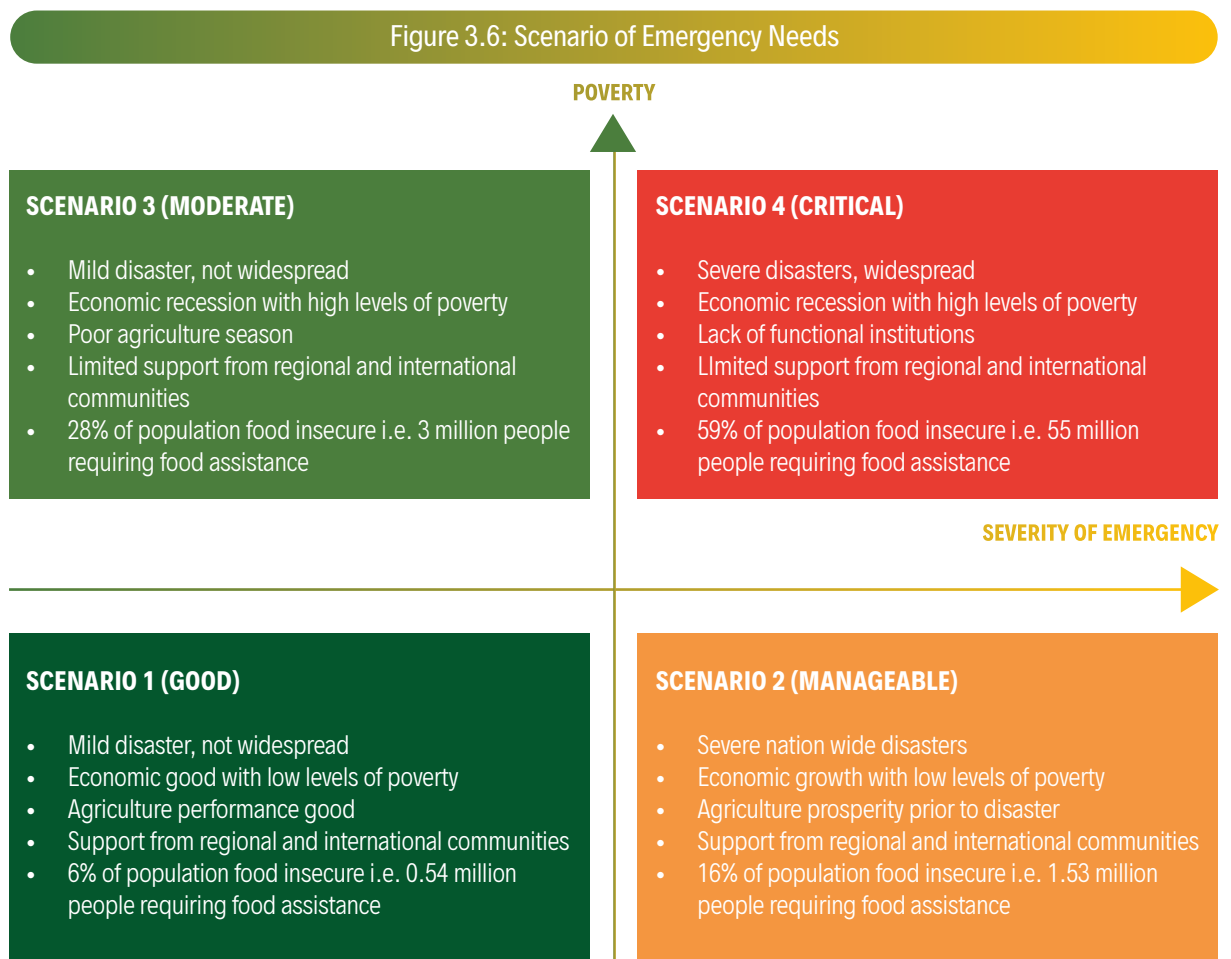
indicated that millers diverted maize meant for the subsidy program to super refined meal, which was not subsidized. Merchants and well-off consumers on the other hand bought the subsidized meal and diverted it onto the black market where it was sold above market price and in some instances at US\$5 per bag. As a result of the distortions created by the subsidy to millers the government abandoned the subsidy program to millers in August 2020. Instead, the Government through the Social Welfare Department has put in place a cash transfer program directly to vulnerable groups.

¹² A complete database of the vulnerable is under construction under the Ministry of Public Service, Labour and Social Welfare to enable the tracing of the actual number of beneficiaries.

3.8 Size of the SGR under Different Scenarios of Emergency Needs

In this section we present different scenarios of emergency needs to demonstrate that the size of the reserve is always dependent on the assumptions that are made. We consider 4 scenarios based in the severity of the emergency and level of poverty. Figure 3.6 summarizes the assumptions of each scenario. For example, Scenario 1 is a situation in which there is relatively low impact disaster in an economy that is characterized by low levels of poverty. In this quadrant, the pressure in food emergency needs is low as the impact of the emergency is low against an economy that is performing very well. While Scenario 4 (critical), is a situation in which there is high impact disaster in an economy that is characterized by high levels

of poverty. The pressure in food emergency needs are very high given that the population was already struggling prior to the severe disaster. For all scenarios, we assume that there is a group of people that will require permanent assistance. Informed by the ZIMVAC and Social Welfare Department, there are 540,000 people (6 percent of total population) in the country that requires permanent food assistance. Also, the results generated from these scenarios do not take into account other dimensions of food security such as food diversity and micro-nutrient deficiency for special groups such as pregnant women, children and the elderly, which are also critical. The details about these scenarios are presented in Annex 3c.



Source: Authors' illustration.

In general, these scenarios show that a severe emergency disaster with high levels of poverty in the country (Scenario 4), about 854,260 metric tons of grain reserves are needed while in fairly reasonable times, only 84,500 metric tons are needed to ensure food security. The SGR levels computed from these scenarios are summarized in Table 3.3 below.

Zimbabwe has for most of the years been between Scenario 2 and Scenario 3 mainly due to widespread drought conditions experienced in the past decade with two exceptions, the 2020/21 and 2016/2017 agricultural seasons. In all the scenarios, it is assumed that the Government will allow private sector imports to complement GMB SGR stocks and imports.

Table 3.5: SGR requirements under 4 different Scenarios of Emergency Needs

Scenario	Computed SGR level
Scenario 1 Low levels of poverty and mild emergency disaster	84,500 metric tons
Scenario 2 Low levels of poverty and severe emergency disaster	237,900 metric tons
Scenario 3 High levels of poverty and mild emergency disaster	468,260 metric tons
Scenario 4 High levels of poverty and severe emergency disaster	854,260 metric tons

Source: Authors' illustration.

3.9 The GMB's social functions and commercial function

Over the years, there has been public outcry on potential conflict of interest in the management of SGR and commercial grain business by GMB. The Government of Zimbabwe in May 2018, passed a cabinet resolution authorizing the GMB to undertake a demerger of its SGR operations from its commercial operations. This led to the formation of Silo Food Industries (SFI) in July 2018. All former commercial activities of the GMB that came into being after the 1996 DTA were hived off from the GMB to be managed under the commercial SFI.

SFI's mandate is to ensure the availability of basic commodities like maize meal, stock-feeds (poultry, piggery, cattle), rice, salt, and flour. Recently, they added cooking oil, kapenta fish,

jam, packed sugar beans, and traditional grains to their product portfolio. The supply from SFI is expected to stabilize market prices of these basic commodities by increasing the supply when there are shortages and ensuring that there is fair pricing. SFI continues to enjoy Government support in terms of capitalization. There is an opportunity for the SFI to partner with private investors to increase their maize processing capacity. This may go a long way in reducing their reliance on the Treasury.

The Government has been commended for separating the commercial and non-commercial responsibilities of the GMB. However, the history on the success of parastatals is not so positive and in this case, the operations of the SFI and the GMB are difficult to separate because of the

political economy of staple grains. A stabilization policy hinged on the SFI is likely to become a financial burden to the nation because it is difficult to balance the social and commercial functions of these parastatals.

Currently, the SFI is relying on toll processing by millers who also compete with them on the market.

This is not a viable and sustainable relationship. The SFI installed milling capacity stands at 2,700 metric tons/week while the contracted capacity (tolling) is 2,800 metric tone/week. This is against a weekly requirement of 12,750 metric tons of maize meal nationally. A strong SFI backed by private capital will benefit farmers in terms of access to viable markets.

3.10 Synergies of SGR management with Early Warning Systems

An efficient SGR management requires an effective Early Warning System (EWS). Timely availability of quality information plays an important role in alerting the government, humanitarian organizations, development partners and traders to the likelihood of food emergencies and informs response planning. Advance warning ensures sufficient time to take appropriate action to cope with a pending emergency.

There are three main early warning systems that are used with the grain reserves in Zimbabwe. These include weather forecasts by the Meteorological department, Crop and Livestock Assessment Reports conducted annually by MLAFWRR and the Zimbabwe Vulnerability Assessment Reports produced by the ZIMVAC see box 3.3.

Box 3.2: Zimbabwe SGR Early Warning System

Meteorological forecasts of a good rainfall season help the GMB mobilize adequate financial resources to procure grain and ensure that there are adequate grain storage facilities. A below-normal rainfall forecast warns of a low and inadequate grain production which requires MLAFWRR and the GMB to put in place grain import programs to boost the grain reserve and ensure that there is enough for consumption up to the next season's harvest. Each year, the Department of Meteorological Services and MLAFWRR carry out workshops to disseminate information on seasonal forecasts and advisories to extension workers who will cascade the information down to the farmers in all districts.

The crop and livestock annual assessment reports produced by the MLAFWRR show the level of self-sufficiency per district and expected national production and are a proxy of how much grain will be delivered into grain reserves. These assessments project the proportion of the rural population that would need

food distribution during the year. Such information is essential in planning for the GMB in terms of where and when stocks should be made available, the magnitude of relief needed and strategies to mobilize required grain depending on the seasonal outlook.

Zimbabwe vulnerability assessment report and grain reserves. The Food and Nutrition Commission (FNC), through the ZIMVAC, conducts vulnerability assessments between May and June every year to identify rural and urban areas that face food shortages. The assessment also projects the proportion of the population that would need food distribution during the periods July to September and October to December of the year of assessment, and January to March and April to June of the following year. This information is essential in planning for the GMB in terms of when stocks should be readily available, the magnitude of relief needed and strategies to mobilize required grain depending on the seasonal outlook.

The early warning system functions well with opportunities for enhancing remote sensing capabilities to improve the crop forecasting capacity of the Meteorological Department. Rainfall predictions from the weather forecasts are at times not accurate and do not allow for appropriate forecasts, therefore food emergencies planning is reactive rather than proactive. So, enhancing the Meteorological Department’s remote sensing capabilities will help the country to prepare for emergencies, project grain imports and provide early warnings on areas of the country or populations that may be in need of emergency food assistance. The information generated could be verified through the current annual Vulnerability Assessments and the Crop

and Livestock Assessments.

The absence of a robust centralized marketing information system (MIS) to inform the SGR in Zimbabwe requires immediate attention. A robust MIS system integrated into the proposed Agricultural MIS when in place will help provide early warning information on food prices, grain stock levels and the supply and demand situation in the country. A good example is the private sector financed SAGIS in South Africa (see <https://www.sagis.org.za/>). Stakeholders and decision makers will have access to quality information that will help them make better decisions in terms of determining grain producer prices, size of the strategic reserve and/or import or export quantities.

3.11 Recommendations to Enhance Management of the SGR in Zimbabwe

Based on the discussion above, a number of recommendations are made in order to enhance

the management of SGR. The key issues and recommendations are summarized below in Table 3.6.

Table 3.6: Summary of Issues and Recommendations for Enhancing SGR Management in Zimbabwe

Issue/Challenge	Recommendation
<p>High cost of managing SGR and inadequate financing from the government.</p>	<p>Reduce the fiscal costs. In the current grain marketing context, the Government is bearing all costs related to grain procurement, storage, distribution and subsidy to consumers. This is a major cost and the cost of government intervention in grain markets must be reduced to a sustainable level to free up fiscal space for investments that drive long term resilience and complement Zimbabwe’s broader economic growth strategy. The government should re-consider its price stabilization strategy by letting the private sector procure their own grain requirements, which is now a major driver of fiscal pressure. Scaling down on the price subsidy to grain processors can reduce the cost of the SGR on the budget by more than US\$50 million. This will allow the Treasury to fully fund the procurement of grain adequate to meet the needs of permanently food insecure people as well as those that may require food assistance when there is a shock. The government could benefit from technical assistance to efficiently update the current methodology of determining the required size of the SGR that is based on the number of people requiring permanent food assistance, the changing consumption patterns and the timing when food assistance is required. This is key because the cost of SGR management depends heavily on the size of physical stocks that are in storage at any given time.</p>

Issue/Challenge	Recommendation
<p>Improve the delivery of emergency assistance.</p>	<p>Establish self-triggering thresholds for timely mobilization of food emergency funding. Given the delays in funding food emergency activities because of the approval procedure, it is recommended that the government put in place self-triggering thresholds to ensure local authorities do not always go back to the Cabinet for approval. This can be based on an ongoing assessment of climatic conditions that can potentially affect production, and accordingly crop supply. Also, the GMB should always have reserved financial resources to cover up for social welfare needs and acquit the resources on a quarterly basis or after every six months.</p>
<p>Weak early warning and in particular crop forecasting and market information systems.</p>	<p>Improve the early warning system by enhancing rainfall and crop forecasting capabilities of the Meteorological Department and create a robust centralized market information system. A management information system providing timely information on food prices and grain stock levels is vital. Stakeholders and decision makers need to have access to quality information to ensure that grain producer prices are informed by the market, size of the strategic reserve and/or import or export quantities.</p>
<p>Poor targeting of vulnerable households for relief food provisions.</p>	<p>There is need to progressively increase the use of food and cash vouchers to improve the targeting of emergency food assistance. However, the current poor macroeconomic conditions (i.e., high inflation and currency instability) and limited availability of food on the market in Zimbabwe do not favor the use of cash vouchers. Instead directing food delivery to affected households is likely to be more effective. In this case, global experience indicates that transfer mechanisms such as food vouchers, food-for-work programs, school feeding, emergency relief and other targeted safety-net programs are more effective than food distribution at subsidized prices.¹³</p>
<p>Poor stocks rotation practices that are at variance with market conditions and the inclusion of all actors adversely affect the market.</p>	<p>Investments in an effective stock rotation system are urgently needed. There is need for strengthening the GMB institutional capacity in terms of how the SGR stock should be rotated to further reduce the post-harvest losses as well as minimizing the impact on the market. In general, the SGR stocks rotation modalities should be based on market prices and the prices should allow cost recovery by the GMB in procurement, storage and handling. The rotation practices should also provide equal access to all market players, not just a selected few and promote transparency and accountability in the transactions.</p>
<p>SGR and relief food system solely focused on maize.</p>	<p>To address micro-nutrient deficiencies in the target groups such as children, pregnant women and the elderly there is need to integrate nutritionally-enhanced maize in national SGR procurement. The procurement of specific targets of orange maize for the SGR and its subsequent distribution as food aid to the poorest regions can play a critical</p>

¹³ World Bank 2012. 'Using Public Food Grain Stocks to Enhance Food Security'.

Issue/Challenge	Recommendation
	<p>role in addressing the persistent issue of hidden hunger. Official procurement targets would encourage private sector participation in the biofortified maize value chain and complementary support for farmers (such as a short-term working capital facility for nutritionally-enhanced crops) can help motivate adoption of nutritionally enhanced maize varieties.</p>
<p>Limited participation of private actors in the maize market since the GMB is currently the sole buyer of maize.</p>	<p>The Government should crowd in the private sector. In light of the current GMB sole buyer policy there is a need to revisit the policy and crowd in the private sector to achieve the desired economic gains and food security. This will require maize market liberalization with private sector participation and market price determination with the GMB retaining its role as a buyer of last resort rather than sole buyer. This requires a repeal of SI 145. An efficient grain sector can be attained when private sector participation is encouraged, thus there is a need to create space for private sector activity by liberalizing part of grain trade such as procurement directly from farmers and outside, storage and processing. Lease part of the GMB grain storage to the private sector to enhance the operation of WRS as part of the country's agricultural recovery pathway. The private actors in the grain market handle about 500,000 metric tons/year yet their storage capacity is only 100,000 metric tons/year indicating that they will need to lease storage at some point in their operations.</p>



CONCLUSION

There have been increasing incidences of climatic shocks affecting the production and availability of food in Zimbabwe and Zambia. In Zambia, the impacts have been mild and localized in certain geographic areas particularly in the southern and western parts of the country. Zimbabwe has been hardest hit due to other confounding macroeconomic and political factors. This situation requires building the resilience of the agriculture sector to ensure production and food security are sustainable.

The study showed that Zimbabwe and Zambia have used strategic grain reserves to stabilize domestic prices and provide emergency food. The fiscal cost of such interventions, particularly the price stabilization programs have been very high. The management in both countries tend to destabilize the market and hence crowd out private sector investments from the grain sector, often overburdening the Treasury through unsustainable production and marketing subsidies. The political economy of SGR management and national food security interventions in the two countries differs somewhat though there is a tendency for advocating for more Government intervention.

Both countries use selected millers to cushion consumer retail prices of processed mealie meal. However, evidence from both countries suggest that this is a less than optimal strategy because the strategy creates opportunities for arbitrage, and rent-seeking behavior at very high fiscal cost.

The study also showed that there is a realization of the high cost incurred to procure grain, of grain, price subsidy to processors and cover the operational expenses of reserve operations in both countries. To minimize the fiscal cost, Governments in both countries are exploring options to make the SGR management self-sustaining by proposing that the GMB and FRA perform both commercial and social functions. In Zimbabwe, the commercial functions have been hived off to Silo Industries, a company wholly

owned by the GMB while options were sought to self-finance the 'social functions'. Zambia on the other hand is proposing to pursue the same course. Although the motive for these considerations is justified, it is often difficult to balance the commercial and social functions of these entities without affecting the operations of the market. The Treasury has to bail out the entities because their functions are subject to political inference and cannot fully operate commercially. While a separate analysis will be needed to advise the Governments on these options, this study underscores that the social functions must be financed by the Government with careful design to ensure efficiency and effectiveness of the GMB operations. The fiscal cost can be reduced by limiting the sizes of the reserves to the required level to stabilize prices (as needed) and provide emergency food access. The study provides a set of scenarios to determine the size – hence volume of grain to be procured and related operational expenses to maintain the stock. The findings show that this should be complemented with reforming regulations and policies to crowd in the private sector into grain markets.

The study outlined several improvements that can be considered to enhance the effectiveness of the SGR operations. The size of the reserves needs to be limited to amounts needed to meet emergency needs. Improving the early warning systems will be vital to determine the reserve size and improve decision making processes. Storage locations and infrastructure quality need improvement to ensure adequate storage and distribution access to markets and targeted beneficiaries. Besides meeting food needs, the SGR interventions can also deliver nutritional benefits by integrating Vitamin A fortified maize as part of the reserve.

Zimbabwe and Zambia should also consider collaborating more on SGR management. The two countries can enter into mutually beneficial bilateral arrangements, depending on the level of production in each country. For example, due to

the production shortfalls currently experienced in Zimbabwe, Zambia could commit to export some of its surplus to Zimbabwe to meet its SGR shortfalls. Both countries would benefit from low transaction costs in the process.

In summary, the strategic grain reserves in both countries have a potential to contribute to food

security only when the fiscal cost is under control keeping the reserves to amounts sufficient to meet emergency food shocks. SGRs should be considered as tools to address short term food security challenges, while the main food security strategy should focus on addressing drivers of food insecurity through investments that raise long term resilience and productivity.

REFERENCES

- Al Mamun, A., Chapoto, A., Chisanga, B., D'Alessandro, S., Koo, J., Martin, W. and Samboko, P., 2018. Assessment of the impacts of El Niño and grain trade policy responses in east and southern Africa to the 2015–16 event. World Bank.
- ASiST., 2018. Food Reserves: Using Food Reserves to Enhance Food and Nutrition Security in Developing Countries. London: DAI Europe Limited.
- Banda, A., Mulenga, B., and Chapoto, A., 2019. Food Security Status Report: October–December 2019. Lusaka: Indaba Agricultural Policy Research Institute. Retrieved from http://www.iapri.org.zm/images/WorkingPapers/Food_Security_Status_Report_Oct_Dec_2019_Final.pdf
- Chapoto, A., 2012. The political economy of food price policy: The case of Zambia, WIDER Working Paper, No. 2012/100, ISBN 978-92-9230-566-6, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki
- Chapoto, A and Jayne T.S., 2009. Effects of Maize Marketing and Trade Policy on Price Unpredictability in Zambia. Food Security Research Project Working Paper No. 38. Lusaka, Zambia: FSRP.
- Chapoto, A., 2019. The Role of Strategic Food Reserves in Enhancing Food Security in Developing Countries: The Case of Zambia (No. 10). Working Paper.
- Chigodora, J., 1997. Famine and Drought: The Question of Food Security in Zimbabwe, Drought Network News (1994–2001). 40. <https://digitalcommons.unl.edu/droughtnetnews/40>
- CSO (Zambia Central Statistical Office). 2013. Population and Demographic Projections (2011–2035). Lusaka: Central Statistical Office. Retrieved July 15, 2020, from <https://www.zamstats.gov.zm/phocadownload/Zambia%20Census%20Projection%202011%20-%202035.pdf>
- Chisanga, B. and Chapoto, A., 2018. Grain Marketing Innovations and Investments in Zambia: Creating Marketing Opportunities for Smallholder Farmers. Working Paper 135, Indaba Agricultural Policy Research Institute, Lusaka, Zambia
- Ecowas Commission, 2012. Regional Food Security Reserves.
- European Commission, 2018. Food Reserves: Using food reserves to enhance food and nutrition security in developing countries Case Studies.
- FRA. 2019a. Standard Operating Procedures Operating Manual. Lusaka, Zambia: Food Reserve Agency (FRA).
- FRA. 2019b. DMMU, MoGE & Community Sales Brief. Lusaka: Food Reserve Agency (FRA).
- GMB. 2020. <http://www.gmbdura.co.zw/index.php/about-us>
- Govere, J., Jayne T.S., and Chapoto A., 2008. Assessment of Alternative Maize Trade and Market Policy Interventions in Zambia. FSRP Working Paper No. 33. Lusaka, Zambia: Food Security Research Project. Available on line at: http://fsg.afre.msu.edu/zambia/wp_33.pdf.
- Government of Zimbabwe. 2019. Statutory Instrument 145 of 2019. CAP. 18:14
- Government of the Republic of Zambia. 2019. Zambia Drought Response Operations

- Plan. Lusaka: Disaster Management and Mitigation Unit.
- Grain Marketing (Control of Sale of Maize) Regulations, 2019
- GoZ, African risk Capacity, and WFP. 2019. Zimbabwe Operations Plan for Drought Emergency Response, National Drought Risk Capacity Operational Plan for Early Response, National operational and action plan to guide early response for a possible drought risk insurance pay-out to vulnerable households in drought affected areas of Zimbabwe through the African Risk Capacity Agency of the Africa Union
- Harman, L., and Chapoto, A. 2017. FISP and FRA Reforms: Investing Savings into a Package of Smart Social Protection Schemes for. Lusaka: Indaba Agricultural Policy Research Institute. Retrieved October 14, 2019, from http://www.iapri.org.zm/images/WorkingPapers/Harman_Chapoto_Social_Protection_paper_ckh.pdf
- IAPRI. 2020. 2019 Rural Agricultural Livelihoods Survey Report. Indaba Agricultural Policy Research Institute. Lusaka: Indaba Agricultural Policy Research Institute.\
- IAPRI. 2019a. Food Security Status Report (July-September 2019). Lusaka: Indaba Agricultural Policy Research Institute. Retrieved July 2020, from http://www.iapri.org.zm/images/PolicyBriefs/Food_Security_Status_Update_w.pdf
- IAPRI. 2019b. The Maize Conundrum: Securing Zambia Food Security through Market Based Solutions in the 2019/20 Marketing Season. Retrieved July 2020, from Indaba Agricultural Policy Research Institute: <http://www.iapri.org.zm/images/PressRelease/MaizeConundrumPress.pdf>
- IAPRI. 2017. A Review of the Proposals of the Food Reserve Act Chapter 225 of the Laws of Zambia. Lusaka: Indaba Agricultural Policy Research Institute (IAPRI).
- Jayne, T. S., Chapoto, A. and Govereh, J., 2010. Grain Marketing Policy at the Crossroads: Challenges for Eastern and Southern Africa. In Food Security in Africa: Market and Trade Policy for Staple Foods in Eastern and Southern Africa, eds. Alexander Sarris and Jamie Morrison. Cheltenham: Edward Elgar Publishing.
- Jayne, T.S., Zulu, B., and Nijhoff, J.J. 2006. Stabilizing Food Markets in Eastern and Southern Africa. *Food Policy* 31.4: 328–341.
- Kean, S. and A. Wood. 1992. Agricultural Policy Reform in Zambia: The Dynamics of Policy Formulation in the Second Republic. *Food Policy* 17.1: 65–74.
- Jean-Denis, C. 2012. Preparing for Thin Cows: Why the G-20 Should Keep Buffer Stocks on the Agenda. (2012). In B. Lilliston , & A. Ranallo (Eds.), *Grain Reserves and the Food Price Crisis: Selected Writings from 2008–2012*. Institute for Agriculture and Trade Policy.
- Kasama, H. (2020, July 13). FRA Sets up 1200 Satellite Depots. Retrieved July 18, 2020, from Zambia National Broadcasting Corporation: <https://www.znbc.co.zm/news/fra-sets-up-1200-satellite-depots/>
- Kuteya A and Sitko N. 2014. Review of the effects of FRA on Zambia’s maize market: High prices despite bumper harvests. Presented to Parliamentarians during Dialogue on Pertinent Issues in Agricultural Sector Workshop, Kariba Inn, Siavonga. Indaba Agricultural Policy Research Institute
- Kuteya, A.N. and Jayne T.S. 2012. Is the Government of Zambia’s Subsidy to Maize Millers Benefiting Consumers? Indaba Agricultural Policy Research Institute Working Paper No. 67. Lusaka, Zambia: IAPRI.
- Kydd, J. 1986. Changes in Zambian Agricultural Policy since 1983: Problems of Liberalization and Agrarianization. *Development Policy Review* 4.3: 233–259.
- Larson, D.W. and Swire-Thompson, A. 1999. The

- effects of Maize Market and policy reforms on Price Discovery and competitiveness in Zimbabwe. 1991-1997. *Journal of International Food and Agribusiness Marketing*
- Lynton-Evans, J. 1997. *Strategic Grain Reserves: Guidelines for their Establishment, Management, and Operation*. FAO Agricultural Services Bulletin 126. Rome: FAO.
- Mano, R., Isaacson, B. and Dardel, P., 2003. Identifying policy determinants of food security response and recovery in the SADC region: The case of the 2002 food emergency. *FANRPAN Policy Paper*, (917), p.36.
- Mason, N.M. and Myers R.J. 2013. The Effects of the Food Reserve Agency on Maize Market Prices in Zambia. *Agricultural Economics (United Kingdom)* 44.2: 203–216. <https://doi.org/10.1111/agec.12004>
- Mason, N. M. and Myers R.J. 2011. The Effects of the Food Reserve Agency on Maize Market Prices in Zambia. *Food Security Research Project Working Paper No. 60*. Lusaka, Zambia. FSRP.
- Ministry of Finance. 2009. *National Budget Statement*, Zimbabwe
- MLAWRR. 2018, 2019, 2020. *Future Prospects of Agriculture In Zimbabwe With Particular Emphasis on Command Agriculture and National Security Strategy*, Unpublished Documents
- MoA/CSO. Various Years. *Zambia Crop Forecast Survey*. Lusaka, Zambia: MoA/CSO.
- Mulenga, B., Banda, A., Chapoto, A., and Chisanga, B. 2019. *Zambian Maize Outlook and Regional Analysis 2019/20*. Lusaka: Indaba Agricultural Policy Research Institute. Retrieved July 2020, from <http://www.iapri.org.zm/images/WorkingPapers/outlook2019.pdf>
- Mutambara, J. 2016. *Maize Production and Marketing in Zimbabwe: Policies for a High Growth Strategy*. Report produced for USAID Strategic Economic Research and Analysis—Zimbabwe (SERA) Program
- Nkonde, C., Mason, N.M., Sitko, N.J. and Jayne, T.S., 2011. Who Gained and Who Lost from Zambia's 2010 Maize Marketing Policies? (No. 1093-2016-87848).
- PARM/IAPRI. 2019. Feasibility for investment to enhance the Zambian warehouse receipt system and aligning the food reserve agency's strategic plans to the system. *Platform for Agricultural Risk Management*. Retrieved July 2020, from https://p4arm.org/app/uploads/2019/08/PARM-Zambia_FS-WRS-Study_2019.pdf
- Samatebele, H. M. 2003. Overview of the Current Food Security Crisis in Zambia. *Food Security in Southern Africa. Causes and Responses from the Region*, Mar 2003, Pretoria, South Africa. p.89-108. hal-00793124
- Sitko, N.J. and Jayne, T.S., 2014. Exploitative briefcase businessmen, parasites, and other myths and legends: assembly traders and the performance of maize markets in eastern and southern Africa. *World Development*, 54, pp.56-67.
- Sitko, N and A. Kuteya. 2013. *The Maize Price Spike of 2012/13: Understanding the Paradox of High Prices despite Abundant Supplies*. Indaba Agricultural policy Research Institute Working Paper No. 81. Lusaka, Zambia: IAPRI.
- UN, (1948) *Universal Declaration of Human Rights*, United Nations, 1948
- WFP (2020) *Economic and food security implications of the COVID-19 outbreak*1 An update with insights from different regions April 14, 2020 <https://reliefweb.int/sites/reliefweb.int/files/resources/WFP-0000115786.pdf>
- Economic and food security implications of the COVID-19 outbreak The cost of the attempt to contain a highly contagious disease https://fscluster.org/sites/default/files/documents/wfp-economic_and_food_security_implications_of_the_covid-19_outbreak.pdf

- "World Bank. 2019. Zimbabwe Public Expenditure Review with a Focus on Agriculture. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/32506> License: CC BY 3.0 IGO."
- Republic of Zambia. (2017). Report of the Committee of Parastatal Bodies on the Report of the Auditor General on Accounts of Parastatal Bodies and Other Statutory Institutions for the Financial Years Ended 31st December 2013,2014,201,2016. Lusaka: National Assembly. Retrieved December 2020, from http://www.parliament.gov.zm/sites/default/files/documents/committee_reports/Parastatal_Bodies_Report.pdf
- ZimVAC. 2019. Zimbabwe Vulnerability Assessment Committee Food and Nutrition Security Report May 2019
- ZimVAC. 2020. Zimbabwe Vulnerability Assessment Committee Food and Nutrition Security Update Report February 2020.

ANNEXES

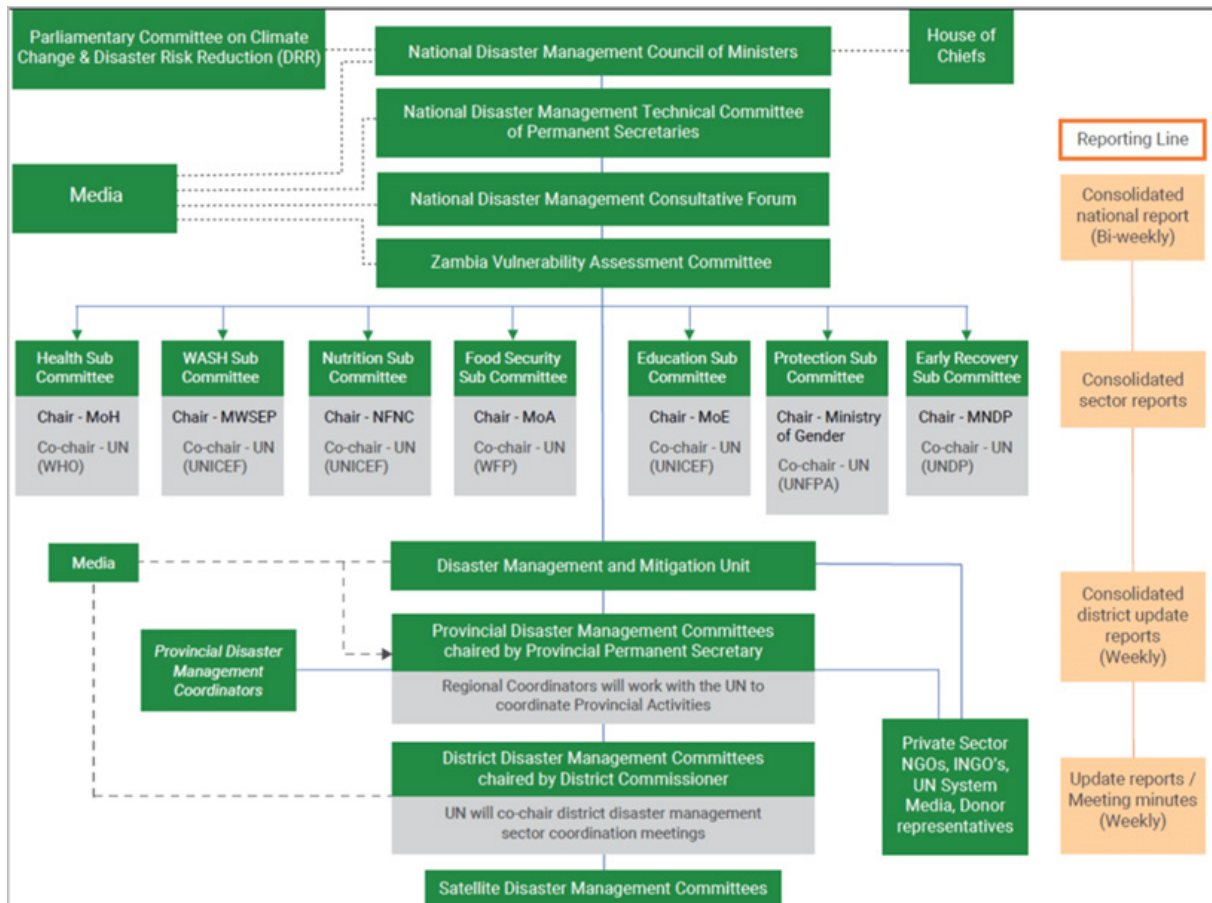
Annex 1A

List of key informants interviewed in Zambia for the study

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Annex 1B

Coordination Structure for Disaster Responses in Zambia (2019/20)



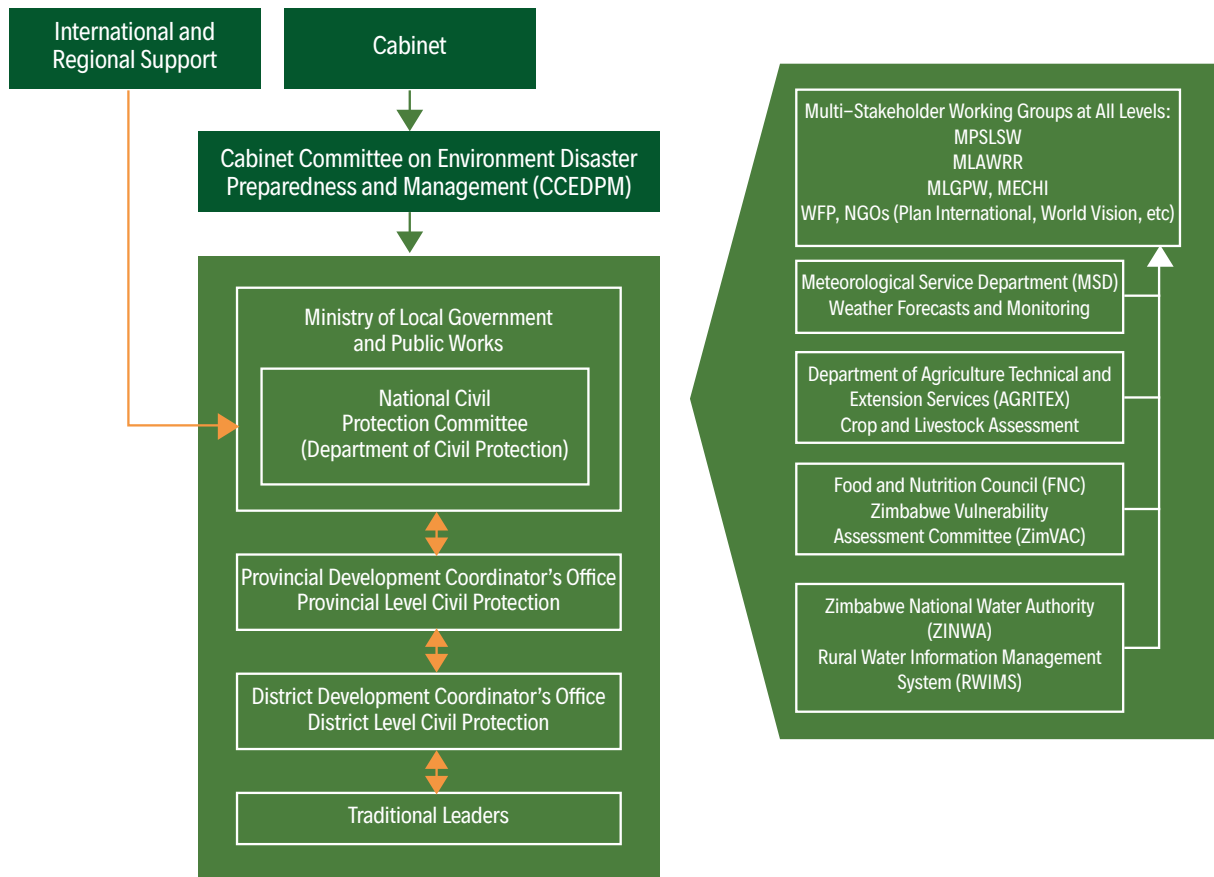
Annex 2A

List of People Interviewed in Zimbabwe

	Name	Organization	Contact Details
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Annex 2B

Scenario of Emergency Needs



Source: Adopted from GoZ, WB and GFDRR (2019), GoZ, WFP and African capacity (2019).

Annex 2C

Scenario 1: Low levels of poverty and mild emergency disaster

In this scenario there is relatively low impact disaster in an economy that is characterized by low levels of poverty. The pressure in food emergency needs is low as the impact of the emergency is low against an economy that is performing very well. A typical year was that of the 2014/15 season. The rainfall was fairly average and the economy was still under a multi-currency system with reasonable levels of inflation and fairly stable incomes. Strategies to manage emergency needs under this situation would involve the following:

- Minimal SGR to provide for vulnerable populations that are not able to produce. These are permanently food vulnerable households that number about 6 percent according to ZIMVAC reports.
- About 540,000 people in rural areas will need food aid of about 65,000 metric tons of grain.
- Requirements for urban poor are estimated at 30 percent of rural poor requirements, thus an additional 19,500 MT will be needed to be distributed in urban areas bringing the total grain requirement to **84,500 metric tons**.

Scenario 2: Low levels of poverty and severe emergency disaster

Under this scenario there is high impact disaster in an economy that is characterized by low levels of poverty. The pressure in food emergency needs is moderately high as the impact of a severe drought is felt on a population that is fairly better off. A typical year is that of the 2015/16 season when the country experienced consecutive droughts. The economy was still under a multi-currency system with reasonable levels of inflation and fairly stable incomes. In this scenario, the economy is strong but the disaster has devastating effects on

food production and the strategies to manage the emergencies. Close to 1 million more people are pushed into poverty by drought. Strategies to manage emergency needs under this situation would involve the following:

- Food reserves needed to feed about 1,530,000 people including the already permanent food vulnerable households (6 percent of population or 540,000)
- 65,000 metric tons required for permanent food vulnerable households in rural areas
- 118,000 metric tons required to feed 990,000 more people pushed into poverty by drought.
- Requirements for urban poor are estimated at 30 percent of rural poor requirements, thus an additional 54,900 metric tons will be needed to be distributed in urban areas bringing the total grain requirement to **237,900 metric tons**.

Scenario 3 (high levels of poverty and mild emergency disaster)

In this scenario there is a low impact disaster in an economy that is characterized by high levels of poverty. The pressure in food emergency needs are fairly high given that the population is already struggling prior to the disaster. A typical year is the experience of 2018/19 when the economy started dove tailing downwards, the multi-currency system was abandoned and inflation started ticking upwards, eroding peoples' incomes against rigid wages. In this scenario, the economy is weak and the disaster is mild. Strategies to manage emergency needs under this situation would involve the following:

- Food reserves needed to feed about 3,000,000 people including the already permanently food vulnerable households (6 percent of population or 540,000)
- 65,000 metric tons required for permanently

- food vulnerable households in rural areas
- 295,200 metric tons required to feed 2,460,000 people affected by drought.
- Requirements for urban poor are estimated at 30 percent of rural poor requirements, thus an additional 108,060 metric tons will be needed to be distributed in urban areas bringing the total grain requirement to **468,260 metric tons**.

Scenario 4—high levels of poverty and severe emergency disaster

Scenario 4 is a situation in which there is high impact disaster in an economy that is characterized by high levels of poverty. The pressure in food emergency needs are very high given that the population would already have been struggling prior to the severe disaster. A typical year is the experience of the 2019/20 season where the country experienced severe and consecutive droughts when the economy was already in poor shape. The economy had been in depression, inflation at around about 700 percent per year and there was rapid erosion of

people's incomes. In this scenario, economy is weak and the disaster intense. This will require heavy investment in social protection as a cushion against the devastating effects of food insecurity. Strategies to manage emergency needs under this situation would involve:

- Food reserves needed to feed about 5,500,000 people including the already permanently food vulnerable households (6 percent of population or 540,000)
- 65,000 metric tons required for permanently food vulnerable households in rural areas
- 595,200 metric tons required to feed 4,960,000 people affected by drought.
- Requirements for the urban poor are estimated at 30 percent of rural poor requirements, thus an additional 198,060 metric tons will be needed to be distributed in urban areas bringing the total grain requirement to **854,260 metric tons** that is distributed as food handouts and subsidized for economically active groups.
- Feeding programs for children, the elderly and pregnant women.

