

Platform
for Agricultural
Risk Management

Managing risks
to improve farmers'
livelihoods

Tools assessment



Zambia

In collaboration with



Indaba Agricultural
Policy Research Institute

**Feasibility for investment
to enhance the Zambian
warehouse receipt system and
aligning the food reserve agency's
strategic plans to the system**

Full report
May 2019





PARM
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AGRICULTURAL RISK
MANAGEMENT

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Foreword

The Platform for Agricultural Risk Management (PARM) is an outcome initiative of the G8-G20 discussions on agricultural growth and food security. It is co-financed by the European Commission (EC), French Development Agency (AFD) Italian Agency for Development Cooperation (AICS) and the International Fund for Agricultural development (IFAD). The German Federal Ministry for Economic Cooperation and Development (BMZ) through KfW Development Bank also contributes to ARM investments through a strategic partnership with NEPAD. PARM aims to generate, facilitate and increase access to and exchange of knowledge to make agricultural risk management (ARM) an integral part of policy planning and investment for food and agricultural sector of developing countries. PARM's activities focus on eight sub-Sahara African countries – Cabo Verde, Cameroon, Ethiopia, Liberia, Niger, Senegal, Uganda and Zambia.

This feasibility study report on “*Enhancing the Zambian Warehouse Receipt System and Aligning the Food Reserve Agency Strategic Plans to the System*” responds to one of the risk management priority areas proposed in the World Bank agricultural risk assessment of 2018 [\[7\]](#). The report was prepared by IAPRI, Zambia. It also received extensive inputs from the Ministry of Agriculture (MoA) and technical guidance from Dr. Ademola Braimoh, World Bank.

The content of this report was discussed with the MoA and national stakeholders during the PARM High-level Policy Dissemination/Dialogue Workshop in Lusaka, April 2018. Feedbacks from the workshop contributed to improving this report, which is still awaiting official validation from the Ministry of Agriculture.

Cover photo: @PARM/Carlos Tomas Lora Acosta



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List of acronyms and abbreviations

ACA	Agricultural Credits Act
BoZ	Bank of Zambia
DFA	District Farmers Association
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
ETG	Export Trading Group
ESC	Electronic Silo Certificates
COMPETE	Competitiveness and Trade Expansion
ECX	Ethiopian Commodity Exchange
FI	Financial Institution
FAO	Food and Agricultural Organisation of the United Nations
FRA	Food Reserve Agency
GMEP	Grain Marketing Expansion Programme
GTAZ	Grain Traders Association of Zambia
GRZ	The Government of the Republic of Zambia
IAPRI	Indaba Agricultural Policy Research Institute
JSE	Johannesburg Stock Exchange
LuSE	Lusaka Securities Exchange
MAZ	Millers Association of Zambia
MIS	Market Information System
MoA	Ministry of Agriculture
MT	Metric Tonne
PACRA	Patents and Companies Registration Agency
PROFIT	Production Finance Innovation Technology
SAGIS	South African Grain Information Service
SATIHub	Southern Africa Trade and Investment Hub
SEC	Securities and Exchange Commission
SGR	Strategic Grain Reserve
US\$	United States Dollar
USAID	United States Agency for International Development
WFP	World Food Programme
WR	Warehouse Receipt
WRS	Warehouse Receipt System
ZABS	Zambia Bureau of Standards
ZACA	Zambia Commodities Agency
ZAMACE	Zambian Commodity Exchange
ZAGIS	Zambian Grain Information Service
ZCF	Zambia Cooperative Federation
ZMW	Zambian Kwacha
ZNFU	Zambia National Farmers Union



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Executive summary

Warehouse receipts (WRs) have the potential to address market-related risks within the agricultural sector. As shown by Braimoh et al. (2018), Zambia's agricultural sector could benefit from further development of the warehouse receipt system (WRS). By reducing price volatility and increasing access to finance, increasing incomes among value chain actors, and reducing counterparty risk and price volatility, the development of WRS in Zambia could facilitate economy-wide growth and attainment of the United Nations Sustainable Development Goals.

This study's primary purpose is to enhance the operational capacities of the Zambian WRS, increase market and financial access, liquidity, and enhance credibility in the commodity markets. Through an analysis of the current status of WRS in Zambia, it identifies existing gaps and provides recommendations for interventions to improve the sustainability of the WRS. This is achieved through a review of the literature and key informant interviews with various stakeholders drawn from the government, private sector, and the farming community.

Overall, we find investing in the Zambian WRS potentially attractive if some problems can be addressed particularly around maize policies given it is the most widely produced commodity in the country. This would trigger sufficient business volume and attract private sector participation in the WRS. Wheat and soya beans are potentially attractive but could also face the same problems as they are designated as strategic crops in the Zambian policy documents. Without addressing the political economy and market interventions, the regulated WRS in Zambia will remain an unsustainable proposition under the Agricultural Credits Act 2010.

The main findings of the study are summarised below:

1. The implementation of the regulated WRS in Zambia can be traced back to the Zambia Commodity Agency (ZACA) which operated from 2001 to 2006, and the first phase of Zambian Commodity Exchange (ZAMACE) which operated between 2007 and 2011. Throughout these periods, the main factors limiting the success of WRS were i) limited adoption of the financial sector of the WR as a financial product; ii) absence of a legislative framework backing WRS; iii) limited volumes especially from smallholder farmers; and iv) limited capacity in terms of human capital and equipment to operationalise the system.
2. Between 2011 and 2014, ZAMACE operations were deemed illegal by the Agricultural Credits Act of 2010. This changed when ZAMACE (a private entity) was appointed as the regulator and promoter of the WRS. This was in view of the fact that the government could not constitute a Warehouse Licensing Authority due to a lack of resources. ZAMACE has continued to perform this role to date since its appointment in November, 2014.
3. Presently, the WRS is regulated by ZAMACE Limited (hereafter ZAMACE) and backed by the Agricultural Credits Act of 2010 which was enacted in 2014. The major successes scored have been the certification of 300,800 Metric Tonnes (MT) of storage space operated by 8 warehouse operators, introduction of grain standards that have been widely accepted by industry players, and deployment of a system for the WRS – Electronic Silo Certificates.
4. On the ground, the WRS still remains a proposition that is yet to receive sufficient buy-in from players across the entire value chain. In 2018, the commodity exchange only recorded 4,000 MT worth of trade that was fully settled through the exchange using WRS.
5. Overall, the legislative framework is supportive of the WRS development although there still remain a few gaps. The main pieces of legislation include the Agricultural Credits Act No. 35 of 2010; the Securities Act of 2016, the Moveable Property (Security Interest) Act No. 3 2016, and the FRA Act Cap 225 and proposed amendments.
6. Inclusiveness of smallholder farmers in WRS is being explored in alternative forms by value chain actors including ZAMACE. For example, ZAMACE in collaboration with Export Trading Group (ETG) provided input finance against stored commodities (about 10,000 MT worth), thus easing the pressure on smallholder farmers to sell their commodities early.

7. A system of collateral management has been successfully practiced by value chain actors (predominantly commercial farmers). This involves commodity-backed financing under collateral management agreements, which allows them to access finance from financial institutions. While this system does not meet the requirements of a WR based on the Credit Act of 2010 because the issued receipt cannot be traded, it has proved to be a successful instrument trusted by financial institutions.
8. The major gaps in WRS identified by the study include the following:
 - a. extremely low awareness levels even among large grain traders and processors;
 - b. misalignment in the legislation governing WRS such as the Agricultural Credits Act (ACA) of 2010 and the Securities Act of 2016. Currently, ZAMACE's trading of warehouse receipts is illegal under the Securities Act 2016 as it designates a WR as a financial instrument.
 - c. capacity limitations in terms of staffing at ZAMACE;
 - d. Limited warehousing management skills in the industry, those with the capacity are trained by the large grain operators/processors such as AFGRI;
 - e. unclear strategy for smallholders' inclusiveness in WRS;
 - f. unharmonised quality standards between ZAMACE and the Zambia Bureau of Standards, and between Zambian standards and regional standards. ;
 - g. reluctance by the financial institutions to finance WRS due to policy inconsistencies in grain markets;
 - h. lack of an up-to-date grain Market Information System (MIS);
 - i. Market distortions caused by ill-timed rotations of food reserves and the lack of clarity in the Agency's direction in relation to its activities on the market.
 - j. Missing legislation to support grain market development; and
 - k. An inadequate ZAMACE trading platform, while the platform is able to handle bids and offers, the automated order matching and settlement modules remain undeveloped, with financial constraints the major challenge at the time this was being done.
 - l. Apart from maize, soya beans, groundnuts and wheat, the production levels of other potential commodities remain low (largely below 100,000 metric tons). The situation is worse when we factor in the geographical spread of the commodities. This limits the likely commodities under which the private sector can certify storage largely to maize, wheat, soyabeans and groundnuts. Maize would make economic sense for certification but it faces political economy challenges as discussed.
9. Commodities with the greatest potential for WRS development, other than maize, are wheat and soya beans. Other potential commodities include rice, white sorghum, cashew nuts, edible beans, seed cotton, and groundnuts. Except for soya beans and wheat, these commodities are predominantly produced by smallholders. We also note that, for the potential commodities under the WRS, national production is below 100,000 MT for all except wheat, groundnuts, soya beans, and maize. Worse still, the household commercial index (the proportion of the crop that is produced and sold) among smallholders is below 40%, for all commodities except seed cotton. This suggests further value chain development for most commodities, or production in tight value chain financing arrangements to spur production.

The study makes the following recommendations:

1. There is a need for financial and technical support to the stakeholders initiative to establish an independent body for the collection of grain market information and stock monitoring modeled around the South African Grain Information Service (SAGIS).
2. Legislation governing the WRS needs to be reviewed. Further, other legislation that could improve decision-making in agricultural marketing is missing or in draft. As a quick fix, it is possible to make the WR trading legal through a collaboration of ZAMACE with the Lusaka Securities Exchange on the trading side of ZAMACE activities. LuSE is regulated by the Securities and Exchange Act 2016, and any receipts generated and traded would then be legal..



3. Zambia needs to ensure policy coherence in implementation of agricultural policies to support WRS development. We recommend a review of the timing of maize stock rotations to minimise market distortions with private sector. Given the need for a government signal supporting WRS activities, we recommend the certification of selected FRA silos in major production (or commercial) areas under the WRS. This could be done initially as a pilot with FRA certifying say 100,000MT storage space for maize, a strategy that has a potential revenue of at least US\$ 250,000 per month. in storage and handling fees assuming full utilization of this space. This allows the FRA to meet some of its immediate liquidity needs and make it more commercially viable without stifling private sector growth.
4. To create confidence and trust in the WRS among industry players, there is a need to have a guarantee fund (and/or an agricultural fund) that covers some of the perceived risks particularly among banks and financial institutions (e.g. price). This can be gradually phased out within the pilot phase.
5. The role of farmer groups in the WRS cannot be overemphasized. For effective participation, producer organizations need to work with business organisations. Due to low levels of commercialization and limited business skills among the smallholder farmers, the use of District Farmer Associations (DFA) as aggregators should be supported. It is recommended that tailored trainings be conducted for community aggregators on warehouse management and the value addition that comes with the WRS.
6. There is a need for capacity strengthening of the Zambia Bureau of Standards (ZABS) to develop additional agricultural standards, and harmonize ZAMACE and ZABS standards.
7. Warehouse management skills are limited in Zambia and need to be enhanced. The available trained individuals are very few and have been trained by the private sector for their own operations. Alongside this training, there is a need for widespread promotion of the WRS to kick-start the entrenchment of a storage industry.
8. To increase confidence in ZAMACE trading platform, there is need to support the current ZAMACE/ Lusaka Securities Exchange (LuSE) collaboration to further develop the LuSE commodities trading platform. This means that ZAMACE's trading platform should be provided through its collaboration with the LuSE so that an established exchange with its core systems and upgrade plans are extended to ZAMACE.

Investment plan

Detail investment plan to address the gaps in Zambia's WRS is available in the annexes 3 and 4. It indicates the lists of activities to be implemented and the associated costs required. Approximately US\$ 24.6 million will be required to address all the issues.

1. Introduction

1.1. Background

Agricultural risks have the potential to generate significant losses across the agricultural value chain. Indeed Braimoh et al. (2018) show that various risks generate significant losses in Zambia's agricultural sector and the economy as a whole. The risk-induced losses do not only impact negatively on household incomes and well-being, especially among the most vulnerable rural poor households who are dependent on agriculture, but also create a major obstacle in terms of accessing finance to procure productivity-enhancing inputs. The consequence is the perpetuation of a vicious low-input, low-yield farm economy which contributes to entrenching rural poverty, whilst reducing the growth-enhancing potential of the agriculture sector in Zambia. Mitigating these risks is therefore crucial if economy-wide growth and development aspirations under some of the United Nations Sustainable Development Goals are to be achieved in the country (particularly SDG 1 and 2).

Extreme price volatility has been identified as one of the most significant market-related risks facing farmers and other players across agricultural value chains in Zambia (ibid), this is largely generated by trade restrictions imposed by Zambia and other countries in Southern Africa (Davids et al. 2017). The regulated Warehouse Receipt System (WRS), which is being implemented by Zambia Commodity Exchange (ZAMACE) Limited (hereafter referred to simply as ZAMACE) has been identified as a tool which can assist value chain actors in managing market access uncertainty and price risks (see Braimoh et al.,2017). Further, WRS could also contribute to improving smallholder access to agricultural finance for the whole supply chain, and minimising counterparty risk which is common in contract farming arrangements that have many buyers (e.g. in cotton for Zambia). Other benefits of the WRS that are not the subject of this paper include reducing post-harvest food losses, improved quality, curtailing cheating on weights and measures, and improving production and yield assessments (World Bank 2016; Coulter and Onumah 2002). ZAMACE, the institution appointed by the Ministry of Agriculture (MoA) to regulate and promote the development of the WRS in Zambia, has been in operation since 2014; after a Statutory Instrument authorising it to enforce the Agricultural Credits Act of 2010 was signed in November 2014 (GRZ 2010). The Agricultural Credits Act provides the legislative framework for the WRS in Zambia. Administrative bottlenecks and funding challenges, as well as policy inconsistencies, which stymied private sector participation, have combined to hinder smooth take-off of the warehouse receipts system.

The WRS by boosting exchange trading will, therefore, be contributing to the emergence of a transparent mechanism for price discovery and also enhance efficiency in commodity trading. This will be by minimizing transaction costs and avoiding the time-intensive process of physical sampling of commodities before the sale, which is common in the informal agricultural trade in Zambia. It is anticipated that when ZAMACE matures, transitioning from a spot market into trading futures and options contracts, producers, traders, and processors¹ can use those instruments to manage price and counterparty risks. By so doing, they will reduce credit and contract default risk, leading to increased availability of finance at a lower cost of borrowing.

¹ Typically, processors and traders that import intermediate inputs do it in a short period of time, and these could enter into storage agreements with warehouse operators.



Since 2006, Zambia has emerged as a consistent surplus producer of maize and soya beans that is resilient to climate-change induced shocks in Southern Africa.. However, trade restrictions due to production shortfalls and high demand in some years has acted as a disincentive for the successful operation of WRS as it is presently largely dependent on maize volumes (a staple crop subject to political interference) (see Saint-Geours and Shiels 2016).

In view of this, there is an urgent need to invest in the development of the WRS and related commodity exchange in Zambia. Turning around the performance of the WRS is critical in ensuring the sustainability of the commodity exchange and hence, enhancing its role as a price stabilization/discovery tool. This is because the guarantee of delivery against warehouse receipts is critical in mitigating counterparty risk of non-performance by sellers, a critical bottleneck in the development of commodity exchanges in most African countries².

The rest of the report is organized as follows, section 1.2 discusses the study objectives and, section 2 presents the methodology and data sources. In section 3, we discuss the evolution of the WRS in Zambia and ZAMACE. Essentially highlighting the commodities currently being certified for under the WRS, potential commodities, the users and benefits. It also provides a detailed account of the WRS activities up until the suspension of ZAMACE (a private entity appointed by the government under the Agricultural Credits Act, 2010, to regulate the WRS in the absence of a Warehouse Licensing Authority) activities following enactment of the Agricultural Credits Act that outlawed unregulated WRS and commodity exchange trading. Further, it presents the current status of the WRS, legislation and other WRS support infrastructure. This is followed by an analysis of government operations through the FRA, and how this interfaces with the WRS. In section 4, we discuss the existing gaps in the Zambian WRS. Finally, we conclude and present the study's main implications.

1.2. Study Objectives

The main purpose of this study is to enhance the operational capacities of the regulated Zambian WRS in order to increase market and financial access, liquidity, and credibility in the commodity markets; consequently, making the entire system more sustainable in the medium-long term. Aligning the operations of the Food Reserve Agency (FRA) with a functional WRS and exchange trading system in Zambia is a prerequisite for success and is discussed in this study. In particular, it involved exploring the feasibility of FRA procuring strategic grain reserves through the WRS, as well as FRA participating in the WRS as a certified storage operator.

If this is achieved, there is the potential to radically transform the agricultural sector in the country. First, it is acknowledged that this will lead to cutting costs and can reduce the unpredictability of government interventions in the cereal market. The change will, however, not be limited to FRA procedures but potentially to more fundamental shift in the types of levers with which the Government of the Republic of Zambia (GRZ) has been intervening in markets for purposes of managing food security and price support programs. (i.e. FRA purchases and market price stabilization through sales of maize to millers at a subsidised rate and export restrictions). It is therefore important that evidence on the feasibility of establishing efficient regulated WRS, fiscal and other benefits are clearly identified and presented. In addition, relevant capacity development needs for key actors, including within the public and private sector, has to be identified and met in order to ensure success as well as minimise unanticipated risks which can undermine the commitment of the Government.

² Noted in several reviews and/or feasibility studies on exchanges which have been led by Dr. Gideon Onumah from the Natural Resources Institute, University of Greenwich. Examples include: Uganda (2004 on behalf of the EU and 2104 with funding by WFP); Ghana (2009 for Securities and Exchange Commission, Ghana and World Bank); and Tanzania (2013 for Bank of Tanzania/the World Bank and the Capital Markets and Securities Authority of Tanzania).

2. Technical approach and methodology

2.1. General Approach

To achieve the study objectives, an analysis of the current status of WRS in Zambia was conducted, essentially identifying the constraints to the sustainability of WRS. This was achieved through: i) a review of relevant literature including on commodity exchanges, WRS effectiveness of dispute resolution mechanisms, adequacy of legislation governing WRS, and the politics of staple foods in Africa; ii) key informant interviews; iii) stakeholder workshop and iv) field visit to selected warehouses in the country. Literature reviewed included recent continent-wide experiences undertaken by the African Development Bank on WRS. Further, given the relationship between commodity trade, maize and strategic grain reserves in Zambia, the study also reviewed the 1995 Food Reserve Act (Amended in 2005), proposed amendments, and linked this to possible realignment of FRA functions to better support the WRS.

Key informant interviews were carried out with relevant stakeholders including grain traders, warehouse operators, millers, exporters, food and animal feed processors, commercial farmers and farmer representatives, Government representatives from the Ministry of Agriculture, Ministry of Finance, Zambia Cooperative Federation, and financial institutions. Other key informants were drawn from cooperating partners including the World Bank, and the United Nations agencies such as the World Food Programme (WFP). Further, the study team also conducted field visits to selected certified and uncertified warehouses in selected districts across the country. This was in order to be acquainted with the operation of the WRS with respect to quality assurance and standards, warehouse inspections, and the various constraints affecting the operations of WRS. The inclusion of the cooperating partners and private sector was to gain insights into the various models of the warehouse receipts system they could be piloting in the country (e.g. the peak trading model in Zimbabwe, and grain banks). The full list of stakeholders interviewed is presented in Annex 1.



3. The Zambian warehouse receipt system

3.1. Introduction

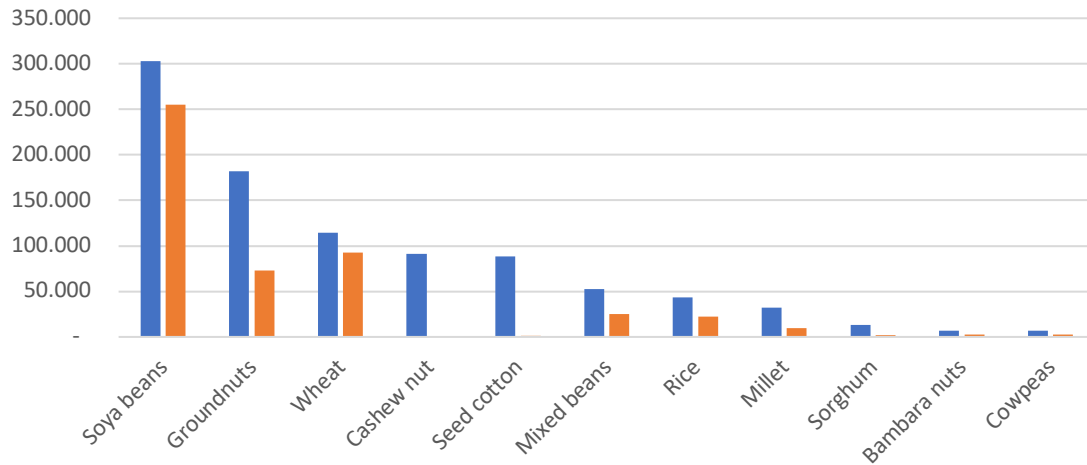
The Warehouse Receipts System in Zambia has to be discussed in the context of the regulated WRS as provided for under the Agricultural Credits Act of 2010. We do not discuss other forms of commodity-backed financing as practiced by the private sector and commercial farmers under collateral management agreements (see Onumah 2013 and Coulter and Onumah 2012 for the different models). In the past

To appreciate the issues and constraints to the successful implementation of the regulated WRS under ZAMACE, this study first looked at the current and potential commodities under the WRS based on production volumes, uses and likely benefits of the WRS. We also discuss the history and evolution of WRS in the country, and why it is intertwined with the development of the Zambian commodity exchange before presenting, the current status of WRS and ZAMACE, and the recommendation on the way forward. This is in recognition that it is not possible to look at the development of the regulated WRS in Zambia without having ZAMACE in the picture as it has been the focal point driver of the regulated WRS after the demise of Zambia Agricultural Commodity Agency (ZACA). An important note is that ZAMACE operated until the legislative reforms in 2010 that led to the suspension of its activities, thus, there are gaps in information on trading activity between 2011 and 2014.

3.2. The Users, Commodities and Benefits

3.2.1. Potential Commodities

In current state, warehouse operators are certifying their warehouses for maize, wheat, groundnuts and soya beans storage. In an effort to get stakeholder input into potential commodities under the WRS, interviewed grain market actors indicated that the easiest commodities to get WRS going are soya beans and wheat. This is because commercial farmers are already involved in collateral management agreements for these commodities. Other commodities identified included **rice, white sorghum, cashew nuts, edible beans** (of which sugar beans is emerging as a very important cash crop), **seed cotton**, and **groundnuts**. Unlike maize, soya beans, and wheat are less susceptible to disabling policy actions, even though soya beans is listed as a strategic crop on which the government can act. We also note that wheat and any other commodity could easily be designated as strategic commodities through the passing of a Statutory Instrument. The other challenge with wheat and seed cotton is that the two commodities are produced under tight value chain financing arrangements and have a ready off-take market. The inclusion of white sorghum is because of its increasing importance in the brewing industry. Trials for commercial cotton production are underway, making it attractive as a commodity under WRS. However, these commodities must be **accompanied by value chain development activities**, especially that the majority are predominantly produced by smallholder farmers.

Figure 1: Production and sales volumes for potential commodities (excludes maize)


Source: CSO/MoA 2017/18 Crop Forecast Survey

For most of the potential commodities, we find that the proportion of production that is sold by smallholders (i.e. the smallholder crop commercialization indices) are below 50%, save for cotton which is grown under contract farming (95%), and potentially wheat which is largely under commercial production (Table 1; Figure 1). When we include large scale farmers, expected sales for potential commodities are at least 40% of production (Figure 1). We note that total production for the majority of the commodities falls below 100,000MT nationally. Only maize, soya beans, and groundnuts have production volumes over 100,000MT. For the other commodities, spreading this production across space yields little incentive for the private sector to certify storage for them. This perhaps explains why most storage operators/processors have certified for commodities such as maize, groundnuts and soya beans. We also note that the production of soya beans, sorghum, cashew nuts and groundnuts has increased since 2013, despite some declines for selected years owing to dry-spells (Table 1). Raising the production levels requires value chain development activities related to an off-take market, inputs and services supply. This is likely to happen medium to long-term.

Table 1: Production and commercialisation levels of potential commodities under WRS

Crop	2013/14	2014/15	2015/16	2017/18	Smallholder (%)	Commercial (%)	Smallholder Crop commercialization index % ³
Maize	3,350,671	2,618,221	2,873,052	2,394,907	95.6	4.4	33.4
Rice	49,640	25,514	26,675	43,063	100	0	37.5
Soya beans	214,179	226,323	267,490	302,720	39.9	60.1	34.7
Cotton	120,314	103,889	111,902	88,219	98.8	1.2	98.5
Sorghum	11,557	8,123	14,107	13,130	95.2	4.8	7.8
Groundnuts	143,591	111,429	131,562	181,772	97.8	2.2	31.2
Edible beans	68,889	55,679	50,779	59,390	99.5	0.5	33.2
Cashew nuts	-	-	-	90,905	100	0	-
Wheat	201,504	214,229	-	114,463	19.1	80.9	-

Sources: MoA Crop Forecast Surveys; IAPRI/CSO/MAL Rural agricultural Livelihoods Survey

³ For edible beans, the index includes Bambara nuts and mixed beans. It was not possible to disaggregate between sorghum varieties, and no data is available for wheat and cashew nuts. The smallholder and commercial shares in production are computed for the 2017/18 agricultural season.



3.2.2. Potential Users of the Zambian WRS

The Zambian WRS could be used by a number of players. For example, the government could procure some or all of its SGR requirements through the WRS. This could be extended to relief maize in times of disasters. The major users however, are most likely to be aggregators of grain from smallholder farmers, farmer cooperatives/associations at the district level, large grain traders, storage operators, boarding schools/institutions of higher learning, financial institutions, and processors (i.e. millers, food manufacturers, animal feed manufacturers, and oil seed processors). We also expect United Nations Agencies to purchase some relief food for the region through the Zambian WRS. As the commodity exchange matures, and futures markets evolve, trade in WRs could be extended to the regional grain market.

3.2.3. The potential benefits of a functional WRS

Onumah (2010) highlights the benefits of developing a WRS in a country. Overall, a functional WRS in Zambia could address the inherent market inefficiencies that characterize African markets. Through improved decision-making in trade policies, and allowing for commodity sales at different times, it could help address the high price volatility in grain markets, particularly for maize. Related to this, a more predictable policy environment triggered by WRS support infrastructure could accelerate investments by the private sector and increase production/processing. Because of community-level aggregation and other investments in storage, post-harvest losses could reduce, especially those arising from pest attacks. By promoting access to better paying markets, the WRS could lead to income growth among value chain actors including aggregators, and producers. Further, because it is a transparent mechanism, cheating on weights and measures that is common among the so-called brief case buyers is curtailed, allowing high returns among commodity sellers.

Through a recognised standards mechanism that rewards quality produce, the quality of commodities being traded could be improved. A functional WRS in Zambia could also contribute to the development of the derivatives market, attracting more capital into the country. It also helps to address one key problem in contract farming i.e. counterparty risk. Because product delivery is guaranteed, it reduces the risk of non-performance of trade contracts. This is important especially for the tobacco, cotton, and soya beans value chains in Zambia. WRS improves liquidity in the agricultural value chain.

Zambia's smallholder farming community stands to benefit the most from accessing finance, as presently, the lack of title on land means they can't use land to access finance from formal financial institutions. FRA delays to pay farmers to allow them to acquire inputs and produce commodities in a timely manner. With the WRS, finance is readily available, and this could allow for enhanced production and productivity. The literature has demonstrated increased production of commodities due to the WRS.

By allowing processing firms to not have to invest in storage and engage in the business of commodity buying and storage, something which they do not have the skills in, a functional WRS in Zambia could create a more efficient market system and allows for more focused investments among firms. Economy-wide impacts expected include improved food security situation, and economic growth triggered by agricultural growth. This is in line with aspirations of the United Nations Sustainable Development Goals.

3.3. History and Evolution of the Regulated WRS in Zambia

3.3.1. The Zambia Agricultural Commodity Agency Era

The development of the regulated Zambian WRS was grounded on its perceived ability to improve transparent and structured commodity trade and the reduction of market instability. This can be traced back to 2001 when the Zambia Agricultural Commodity Agency (ZACA) was formed. ZACA was established with the purpose of certifying storage and licensing warehouse operators to issue WRs. Bonaglia (2007) credited ZACA as a

United States Agency for International Development (USAID) funded stakeholder body which had created a WRS which would foster access to finance for farmers. According to ZAMACE (2011), ZACA had certified more than 25,000MT of storage capacity and recorded 17,000MT of receipted commodity (Table 2). ZACA also provided grain testing services for the FRA as part of its grain testing service.

However, ZACA did not take-off as originally envisaged. While making some inroads in initiating the WRS, certifying some storage and actually storing commodities under warehouse receipts presented challenges for ZACA which resulted in its discontinuation. Andrews et al. (2007) advanced four underlying reasons why ZACA did not perform as expected. These can be summarised as follows:

1. The lack of a nationally coordinated and transparent commercial market which was sufficiently volume driven to provide the demand pull for warehousing services.
2. This limited the confidence and demand for warehouse receipts and as a result, the financial sector did not adopt the WR as a financial product, despite the existence of a USAID partial credit guarantee on WR lending.
3. The financial sectors' reluctance was worsened by the delayed amendment of the Agricultural Credits Act of 1995 to recognise the WR as a document of first title.
4. The ZACA donor-led mandate to focus on smallholder participation could not generate the required volumes to move the market towards a desire for transparency and volumes-based market platform.
5. There were human capital inadequacies which led to poor service delivery and lapses in its certification role making it lose market confidence.

Table 2 : ZACA Certified Warehouses

Season	Warehouse Operator	Depositor	Maize (MT)	Soya beans (MT)	Location
	Metric Tonnes				
2001/02	CHC Commodities	CHC Commodities		100	Lusaka
2002/03	No records				
2003/04	Wanga Farms	Wanga Farms	15,000	-	Chisamba
	Wanga Farms	Kulya Nkona Cooperative	954	-	Chisamba
	Baltic Control	Friston Ltd	505	-	Mkushi
	Baltic Control	Bruce Skinner	750	-	Mkushi
	Seaboard NMC	Omnia Fertilizers	2,017	-	Kabwe
	AFGRI Corporation	AFGRI Corporation	100	-	Lusaka
2004/05	No deposits due to drought				
2005/06	Seaboard/NMC	Zdenakie	3,936	-	Kabwe
	ZAMAC	ZAMAC	2,171	-	Kabwe
	ZAMAC	Zdenakie	294	-	Kabwe
	Iposo Trading	Iposo Trading	1,506		Lusaka
	Iposo Trading	Kabanze Cooperative	202	-	Kabanze
	Iposo Trading	Mumbwa Farmers	319	-	Mumbwa
	Graincom Ltd.	Chikankata Farmers	348	-	Chikankata

Source: Compiled from ZAMACE data



3.3.2. The Establishment of ZAMACE

The recognition that WRs should not be considered as a stand-alone service or function, but a result of a transparent and well-functioning transaction system which in turn buoyed the demand for WR services influenced the USAID - Production, Finance and Improved Technology (PROFIT) project to shift its focus by disbanding ZACA in 2006 to support the development of a private sector driven WRS linked to a commodity exchange platform (Andrew et al. 2007). This new body would inherit the WRS developing activity from ZACA and was expected to have a more sustainable commercial focus. USAID-PROFIT supported private companies' initiative to incorporate ZAMACE in May, 2007.

The exchange was initially owned by seven major industry stakeholders (see Table 3). As the market supported the idea of a commodity exchange more members subscribed to a total of fifteen, which included the FRA. ZAMACE from inception inherited the warehouse certification and grain standards development/testing service which was under the defunct ZACA. A look at the Exchange's mission statement brings out the intended link between the market platform and WRS development:

"ZAMACE will provide an efficient and vibrant Zambian and regional agricultural commodity exchange, supported by a warehouse receipts and certification system to enhance market access, liquidity and credibility in the Zambian commodities market".

Table 3: ZAMACE Shareholders as at 31st July 2011

	Year of Membership	Broking Member
1	Inception	Agricultural Advisors International Limited
2	Inception	AFGRI Corporation Zambia Limited
3	Inception	Amagrains Limited
4	Inception	CHC Commodities Limited
5	Inception	Quality Commodities Limited
6	Inception	Seaboard Commodities Limited
7	Inception	Zednakie Commodities Limited
8	2008	Cargill Zambia Limited
9	2008	Dunavant Zambia Limited
10	2009	Export Trading Company (ETC) Zambia Limited
11	2010	Food Reserve Agency (FRA)
12	2009	Olam Zambia Limited
13	2009	Sakiza Spinning Limited
14	2009	Savanna Commodities Limited
15	2009	Simba Milling Limited

Source: ZAMACE

Some of the objectives of establishing ZAMACE as highlighted in ZAMACE (2008) were as follows:

- a. To provide a credible certified warehouse receipt service which will include regular inspection and certification of storage facilities, and the maintenance of a warehouse receipt registry to allow the transparent knowledge of and transfer of receipts among broker members of ZAMACE.
- b. To become the independent standards and grades facility for the industry and facilitator of an arbitration process for disagreements within the system.

3.3.3. The Services Offered by ZAMACE

ZAMACE attempted to offer a trading platform which would guarantee quality and quantity (Q&Q) through a WRS and offer an alternative dispute resolution mechanism through arbitration. The warehouse operator would be required to have a performance bond and USAID offered a partial credit guarantee of up to 50% for financiers of WRs. It was envisaged that financiers would take out an agricultural charge under the Agricultural Credits Act of 1995 over stored commodity on a WR. More detailed discussion is done under the section reviewing the legal framework. ZAMACE offered to the market four key services: a) Grades and Standards; b) Transparent rules; c) Trading Platform and; d) Dispute Resolution through arbitration.

ZAMACE established a Board Standards Committee which looked at developing and revising quality standard specifications for grain. Standard specifications were developed for maize, wheat, soya beans and sunflower (Table 4). These commodities were deemed to be produced in sufficiently large quantities and demand to be able to attract trade on the commodity exchange. The ZAMACE wheat standard was subsequently harmonised with the South African one. Most of the large wheat processors demanded the South African standard and wheat farmers also felt the need to make Zambian wheat comparable in the export market. The old wheat standard was also deemed to have complex parameters and this harmonisation made it easier and helpful to trade in foreign markets.

Table 4: Number of ZAMACE Lab Tested Samples by Commodity

Year	Number of Tested Samples				
	Wheat	Soya beans	Maize	*Other	Total
2007	490	2	10		502
2008	1,174	124	38	2	1,337
2009	713	108	197	5	1,023
2010	1,121	84	135	494	1,834
2011	657	58	132	3	850
Total	4,155	376	512	504	5,546

Source: ZAMACE

It is important to state that all grain market actors interviewed for this study expressed awareness and in fact use the ZAMACE Standards—an indication of the wide acceptability of these standards by grain market actors. This could be explained by the fact that before the establishment of ZAMACE, sellers had to rely on quality testing conducted by buyers or none at all as observed by Coulter and Onumah (2002). ZAMACE established itself as the lead organisation advocating the inclusion of quality above quantity in the trading of grain and with the financial support of stakeholders such as WFP and Musika Development Initiatives (hereafter referred to as Musika). Quality of grain and its maintenance whilst in storage was central to the development of the WRS and an added advantage of the structure. In the event of a dispute on quality, the ZAMACE Lab would be final.

ZAMACE however, lacked the capacity to maintain and invest in new lab equipment and gave up the grain testing service in 2012. It was hoped that a new lab service with the support of the USAID Southern Africa Trade and Investment Hub (SATIHub) would assume this role. SATIHub supported Deltamune South Africa to acquire Vetlab laboratory service based in Lusaka's Showgrounds and upgrade it to an ISO 17025 accredited laboratory, the first in the Southern African Development Community (SADC) countries outside South Africa (SATIHub, 2015). ZAMACE also provided its old grain testing equipment to Vetlab. One would have expected that the national standards body - the ZABS, would have been the right body to develop these grain standards. However, at the time, the body was not empowered enough to provide this service as it didn't have the equipment and resources to do so effectively. More recently, ZAMACE and ZABS both agreed that it was the national standards body needed to take the lead in the revision and development of standards⁴.

⁴ The recommendations section discusses in more detail why this needs to be done and what is required to move this process forward.

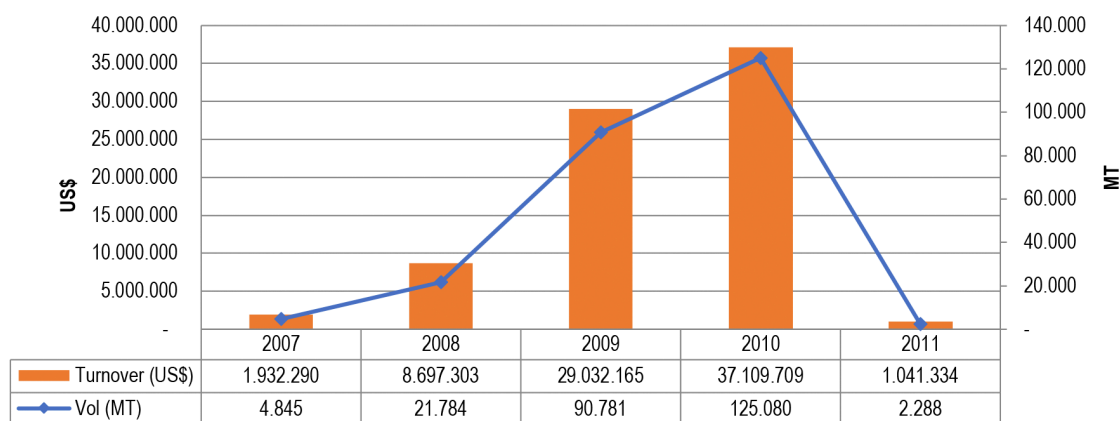


The establishment of ZAMACE was also driven by stakeholder demand for a centralised and structured market platform which would help mitigate some of the multiple imperfections in the trade of agricultural commodities. These imperfections are cited as relatively high transaction costs, asymmetry of information, low transparency and trust, poor smallholder aggregation/storage and access to markets (ZAMACE 2013). The ZAMACE rules-based trading platform was therefore designed to facilitate guaranteed trade and settlement of transactions, and in so doing facilitate anonymous trade which is characteristic of most exchanges. This is one of the missing cogs in the ZACA-WRS gear cited by Andrews et al. (2007). The trading platform was envisaged to be a transparent market place for trade of commodities and therefore valuation for stored commodities under WRs, as well as an enabler for the financial sector to finance WRs if they could ascertain their value; and also be able to trade the WR in the event of default or in mutual consent to liquidate the WR.

3.3.4. Trade Volumes Under the ZAMACE Trading Platform

The ZAMACE trading platform has recorded limited transactions since inception. ZAMACE recorded its first trade in the last quarter of the year of incorporation in 2007 to mid-2011 when the exchange suspended activity to allow for policy and legal reforms which impacted negatively on its operations. Figure 1 shows that ZAMACE traded a total of 245,000 Metric Tonnes (MT) of various commodities worth US\$78 million between 2007 and 2011. The spikes in trade turnover and volume noticed in 2009 and 2010 are attributed to the coming to the market of the WFP which pioneered its first trade on ZAMACE, an increase in wheat transactions after the harmonisation of the wheat standard with that of South Africa and some sales by the FRA. It is important to note that Zambian exchanges (i.e. the financial securities, and commodities exchanges) which have recorded trading activity are voluntary in their use. This is different from the Ethiopian Commodity Exchange (ECX) whose success is largely due to the mandatory trading of coffee through the platform. Further, the ECX is owned by the Government, which is not the case for ZAMACE. Instead, ZAMACE's establishment was driven by the private sector with the hope that they could demonstrate its usefulness in the country.

Figure 2: ZAMACE Aggregate Trade Turnover and Volume



Source: Compiled from ZAMACE data

In 2010, ZAMACE in collaboration with the Ministry of Agriculture (MoA) agreed for the FRA to trade 20% of its grain on the Exchange. However, in that year, FRA only traded 1.5% of its purchased grain on the Exchange. Despite the low actual traded commodity, it ended up being almost 21% of the total maize traded on ZAMACE in the period 2007 to 2011 (Table 5). FRA was granted gratis membership of ZAMACE to facilitate its own trades as the use of an independent broker was not in line with the Agency set up. One of the major reasons for FRA's limited activity on the exchange was the inability to adjust price during trading sessions, as the decision-making processes were long and often required the Minister of Agriculture's clearance. Therefore, due to the fact that the market knew FRA's price despite the changing market conditions, it was easy to out-bid them in a trading session. However, FRA is an important actor in the grain trading space and its participation is key and should be used as a catalyst for stimulating the development of the commodity exchange. Hence, the FRA Act requires to be amended to align with the operations of WRS and Commodity Exchange.

**Table 5: FRA Maize Trades on ZAMACE**

Year	Maize Traded on ZAMACE(MT)	SGR Purchases by the FRA (MT)	National Production (MT)	
	Total	FRA Trade on ZAMACE		
2011	-	-	1,751,660	3,020,380
2010	47,036	17,761	1,147,900	2,795,483
2009	26,443	-	258,200	1,887,010
2008	10,679	-	70,600	1,211,566
2007	1,370	-	316,100	1,366,158
TOTAL	85,528	17,761	3,544,460	

Source: ZAMACE; MoA Crop Forecast Surveys (2007-2011)

Table 6 shows the record of ZAMACE trading activity from inception to the time the exchange suspended its activities to allow for a supportive policy environment to catch up with its activities. Wheat was the most traded grain followed by white maize, soya beans, and maize meal (typically WFP relief exports). This dispels the notion that ZAMACE mainly traded maize but rather that its trade of maize for the period was about half the monthly national consumption of the commodity by processors, and therefore significantly low. With favourable policy interventions in the maize market, maize could potentially be transparently traded on the exchange.

Table 6: ZAMACE Trading Activity 2007-2011

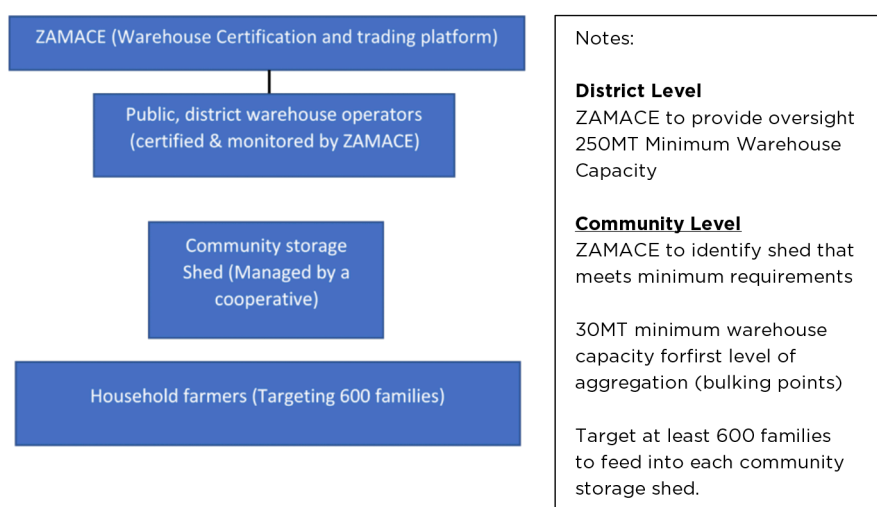
Commodity	Volume (MT)	Turnover (US\$)
Wheat	103,652	36,487,392
White maize	85,038	21,320,924
Soya beans	41,452	15,253,318
Maize meal	11,322	2,904,514
Pulses	637	297,473
Cement	420	127,363
Urea fertilizer	400	278,550
Mixed beans	350	409,000
Dap fertilizer	350	248,500
Maize bran	350	27,875
Yellow maize	270	82,950
Ugrade maize	220	31,100
Speckled kidney beans	150	123,750
Soya bean oil	140	195,000
Fuzzy cotton seed	15	2,400
Corn soya blend	12	22,692
TOTAL	244,779	77,812,801

Source: ZAMACE

3.3.5. ZAMACE in the Village – Grain Marketing Expansion Program (GMEP)

Between 2010 and 2011, ZAMACE implemented a US\$454,000 community-based aggregation model to stimulate the development of the WRS with the support of USAID Competitiveness and Trade Expansion (COMPETE) program. This was based on the reality that smallholders accounted for most of the production, especially for maize and other non-commercial crops. Whereas it was easier to get the larger traders to certify storage in major production areas, the producers and suppliers of the grain were inevitably smallholder farmers. The model was structured as shown in Figure 3.

Figure 3: ZAMACE-GMEP Model



Source: Author's illustration based on ZAMACE GMEP Model

The focus of GMEP was to train farmers in quality standards, grain handling, and aggregation in community sheds. This high quality grain stored in community sheds would be through-put to district certified warehouses and therefore placed for sale on the ZAMACE trading platform. The WFP Purchase for Progress (WFP-P4P) collaborated with ZAMACE and provided maize shellers on lease to farmers over two agricultural seasons, grading sieves, measuring scales, moisture meters and training materials which were translated into seven major local languages. Eight district warehouses were certified in the three GMEP focus areas of Eastern, Central and Southern Provinces (Table 7). Further, 14 community aggregation centres were identified to feed into these district certified warehouses. Stored grain was placed on the ZAMACE platform but did not trade because farmers did not agree to sell their maize at the prevailing market price but preferred to sell to FRA which was offering a relatively higher price.

Table 7: ZAMACE GMEP Certified Warehouses

Regions	Warehouse operators	Warehouse capacity (MT)	Community sheds/first level community aggregation points	Capacity (MT)	
Southern province	Moomba Investments (Monze & Kalomo Districts)	300	Basanje cooperative shed	30	
			Mujika cooperative shed	30	
			Chiyobola shed	40	
			Njola shed	30	
			Tendi cooperative (Monze urban)	30	
	AFGRI Choma District	5000	Kanchele	300	
			Mpangwe	60	
			Siamaluba shed	300	
	Central Province	AFGRI/Citron (Kabwe & Mkushi districts)	270	Kalwelwe shed	60
				Mulonga farm shed (Kangomba coop)	70
10000			Masansa cooperative shed	1000	
			Tamutasha cooperative	30	
			Libeya cooperative	60	
			Chaloba cooperative	40	
Eastern Province	COMACO (Nyimba, Lundazi & Mfuwe districts)	1000	Lundazi	500	
			Nyimba	400	
			Mfuwe	250	

Source: ZAMACE (2008)

3.3.6. Suspension of ZAMACE WRS Development Activities

The repeal of the Agricultural Credits Act of 1995 and the enactment of the Agricultural Credits Act of 2010 (ACA) led to the suspension of ZAMACE WRS activities. Any WRS operations by ZAMACE were deemed illegal under these two instruments until such a time that the legal requirements were met. The ACA of 2010 established the WRS and provided for the Warehouse Licensing Authority to regulate the certification of warehouses and the issuance of WRs. However, despite the positive development in the passing of the ACA, no transitional measures were provided for activities that were being carried by ZAMACE. The new Act, therefore, made it illegal for anyone to provide WRS services without authorisation by a regulator which was not in place at the passing of the Act. This situation persisted until the end of 2014 when stakeholders lobbied the Minister of Agriculture to invoke section 6(1) of the Act and through a Statutory Instrument No. 59, 2014, ZAMACE was appointed as the Authorised Agent to perform the functions of the Warehouse Licensing Authority.



3.4. Current Status of the WRS

ZAMACE has deployed a respectable system for the WRS – Electronic Silo Certificates (ESC), a system similar to the one utilised by the Johannesburg Stock Exchange (JSE) for its grain futures market. This is a South African system developed for the local grain industry by SiloCerts and initially sponsored by Senwes and AFGRI Corporation. It is a web-based system with the database registry independently secured by Exordia Division of PricewaterhouseCoopers. According to Silocerts (2018), the system offers the ability for full WR life-cycle management in a secure and best practice manner.

3.4.1. Legislative Framework

The main piece of legislation governing the Zambian WRS is the Agricultural Credits Act of 2010. It covers the critical legal and regulatory requirements such as administration, licensing and oversight of warehouses, contractual rights and obligations of the parties, negotiation and transfer of warehouse receipts; warehouse receipts: legal status, format, details, form and registration, settlement and release of stored goods, and execution and priority of obligations, offences and penalties. A related and equally important piece of legislation is the Securities Act, 2016 which lists the Warehouse Receipt as a financial instrument and thus lends it to regulation under the Securities and Exchange Commission. This means that it cannot be traded unless issued by an agency regulated by the SEC, of which ZAMACE is not. In addition, the Movable Property (Security Interest) Act, No.3 of 2016 includes Warehouse Receipts as instruments that can be registered in the online collateral registry, thus offering additional security to the lender. Further, the FRA Act, 2005 seeks to promote the WRS by facilitating agribusiness and provides for a consultative stocks rotation of grain reserves. However, implementation is seldom coherent.

However, while these pieces of legislation are fairly adequate in getting the WRS moving, some legislation to govern agricultural marketing is missing and remains in draft, and as noted above, there are conflicts in legislation. Case in point is the Agricultural Marketing Bill which has remained in draft form for a long time, leaving market decision main sub-optimal. In total, the legal expert interviewed for this study indicated that addressing the legal and regulatory challenges around the WRS in Zambia would need a review of about 17 other Acts. Additional detail on the legislative gaps is provided for in the Annex.

3.4.2. Trading Activity and Certified Storage

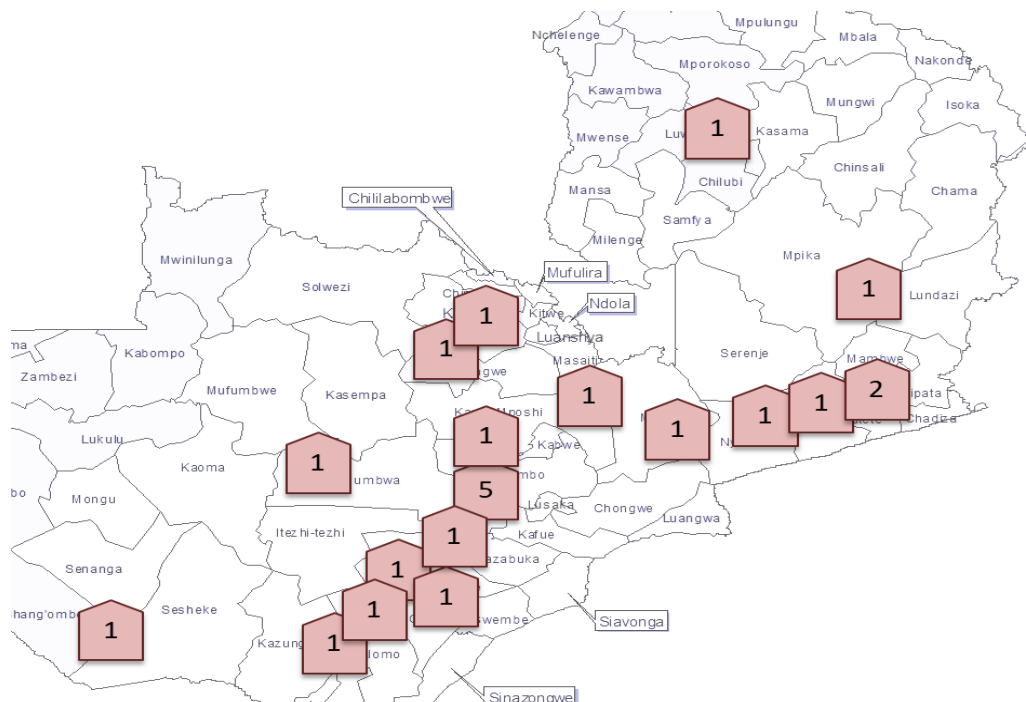
In 2018, ZAMACE only recorded transactions through the exchange for a total of 4,000MT of maize that was secured by a miller. A total of 7,200MT of maize grain was booked and 4,000MT went for final settlement while the balance of 3,200MT was cancelled (ZAMACE, 2018). The WRS however, still remains a proposition as the entire value chain has not been canvassed to demonstrate its operation. Most of the stakeholders interviewed indicated the need for “proof of concept⁵” and are willing to certify some of their storage if the system works. For instance, a miller on the Copperbelt Province stated that they are forced to have up to six months of storage capacity to safeguard stocks. However, if the WRS was functional, they would actively utilise it to acquire stocks and reduce their stock holding to 30 – 60 days. Another miller indicated that they had an annual demand for maize of 70,000MT and 15,000MT of soya beans, and would be happy to utilise the WRS if it was working. The willingness among grain processors to participate in the WRS resonates very well with their comparative advantages. Many indicated that they are not in the business of grain procurement; instead, their advantages lie in processing. Many farmers and traders interviewed during the study indicated they were not aware that the system was available in Zambia and that ZAMACE was the appointed Authorising Agent appointed by Government to promote the WRS. The low level of awareness about WRS and the commodity exchange suggests that ZAMACE capacity to do more outreach needs to be strengthened.

⁵ This was in reference to demonstrating that the regulated WRS could work. Currently, most producers and traders use unregulated forms of WRS whose receipts are not tradable.

According to ZAMACE, 8 private sector warehouse operators with a total estimated capacity of 300,800MT have been certified in a number of locations including Lusaka, Central, Copperbelt, Eastern, Northern, Luapula and Southern Provinces (Table 8). This is mostly in areas around the line of rail, Figure 4 shows the locations of storage facilities among members of the Grain Traders Association of Zambia (GTAZ). In 2013, storage space among GTAZ members was at 550,000 MT this has almost double to 947,000 MT in 2018, with new investments. These are largely located along the line of rail and coincide with the major production zones. Should need arise for more certified storage, the current 300,800 MT capacity could easily be expanded with private sector indicating interest to certify their storage under the WRS. However, for this to happen ZAMACE's capacity to do more outreach to raise awareness on the WRS and its associated benefits and operations needs to be supported. ZAMACE has also collaborated with Export Trading Group (ETG) to provide input finance against stored commodities. This is expected to ease the pressure on smallholder farmers who need finance and at times forced to sell when prices are low. Depositing grain in the certified warehouse and then issued a WR that they can use to access inputs helps them to wait and sell their grain at better prices.

There is a lot of scope for FRA to help smallholder farmers through certifying some of its storage facilities in accessible areas and issue farmers with receipts. Partnership between FRA and private sector in running the certified warehouses could be considered and could go a long way to help deal with liquidity challenges as well as provide smallholder farmers with an opportunity to gain a good return for their crop.

Figure 4: Distribution of Storage Sites for Members of the Grain Traders Association of Zambia



Source: GTAZ



The Food Reserve Agency is a major player on the market, and any purchasing or stock rotation activities tend to have significant impacts on the market. Because the production of other commodities than maize are still low as earlier alluded to, and that some potential commodities could easily lend themselves to FRA intervention, FRA participation in the WRS will show commitment to the development of the grain sector and at the same time will instil confidence in the financial sector to finance the WR so that depositors can access part of the value of the commodity stored. This is not the case under the current FRA system where farmers sell their maize outright without the opportunity to benefit from price increases later in the season.

Table 8: Certified Warehouse Operators

S/N	Operator	Location	Certified Capacity (MT)
1	AFGRI Corporation	Kabwe	10,000
		Lusaka	10,000
		Mkushi	30,000
		Mpongwe	25,000
		Petuaque	25,000
2	CHC Commodities	Kapiri Mposhi	3,000
		Lusaka	20,000
		Mkushi	3,000
3	Export Trading Group	Chipata	5000
		Choma	1000
		Kalomo	4000
		Katete	1500
		Lusaka	80000
		Mumbwa	500
4	Moomba Investments	Pemba	200
5	Mount Meru Millers	Chibombo	36000
6	Munzuma Estates	Monze	600
7	United African Grains	Lusaka	25000
8	Zdenakie	Kasama	500
		Lusaka	20000
		Mansa	500
Total		300,800	

Source: ZAMACE 2018

3.4.3. WRS Operational Framework

The legislative framework for the WRS is contained in the Agricultural Credits Act (ACA), 2010. However, the operational framework is provided for in the ZAMACE Rules and Regulations. It must be noted that under the current legislative framework, only ZAMACE as appointed under SI 59, 2014 can certify a warehouse operator and associated storage infrastructure for issuing of WRs.

ZAMACE Warehouse Operators Rules and Requirements

The Rules for Warehouse Operators are contained in Chapter 7 and Regulation 49 of the ZAMACE Rules and Regulations. This Regulation refers to Appendix 10 which gives the operational detail for the inspection, certification and operations of warehouses. The basis for these guidelines is provided for in section 5(2) of the Act⁶. According to Appendix 10 of the ZAMACE Rules and Regulations, the purpose of the rules is to provide minimum standards which warehouses and warehouse operators have to meet to be certified by ZAMACE to handle and store commodities and issue WR against these stored commodities. The Rules describe systems, controls and procedures which have to be followed for qualitative and quantitative monitoring and control of stored commodities. These Rules are meant to enable ZAMACE achieve the following:

- a. Set minimum standards for sound warehousing practices in the country, promoting uniformity in grain handling, storage and receipting.
- b. Set licensing requirements and enforce them by means of comprehensive on-site examination of procedures and processes
- c. Protect from loss of the stored agricultural commodities
- d. Assure the integrity of WRs as dependable collateral for financial institutions
- e. Facilitate local and regional trade

Application for Warehouse Certification

Anyone interested in certifying storage is required to submit an application to ZAMACE on a prescribed form. The form is simple and collects the following key information:

- a. Name of the applicant and their contact details
- b. Physical location of the storage
- c. Commodity to be stored
- d. Estimated storage capacity
- e. Applicant interest in the facility, i.e. whether it's owned or leased. If leased evidence of the lease agreement indicating that the owner has no interest in commodities to be stored.
- f. Declaration by the applicant to apply as per provision of the ZAMACE Rules and to pay the requisite fee

Requirements for Warehouse Certification

ZAMACE requires that an applicant for warehouse certification provides details indicated on the Evidence Required Form as follows:

- a. Certification evidence - This includes technical ability evidence such as Graders certificates for the storage officers, weighbridge and/or platform scale calibration certificate, and moisture meter and other calibration certificates.
- b. Insurance - The applicant is required to provide evidence of adequate insurance cover against fire and material damage, theft, fidelity guarantee and professional indemnity.
- c. Company compliance - The applicant is required to provide evidence of compliance with legal requirements such as Local Authority Fire certificate, business license certificate of incorporation, Articles of Association, VAT certificate, Tax Clearance Certificate, company profile and any other relevant documentation.

6 "Formulate guidelines and standards for the proper storage of the agricultural commodities." S5(2)(f), ACA, 2010



Confirmation of Certification

A ZAMACE or assigned official physically inspects and assesses the storage suitability for storage of the applied commodity and issues a report to the applicant and indicates any issues identified for rectification. If the applicant and their storage is found to be fit and proper, they are issued with a Warehouse Operator's Certificate for the applied and inspected storage infrastructure.

The successful applicant is also entered into the ZAMACE register of Warehouse Operators and this is made public and available at the Exchange. The certification can be revoked if there is a breach of the Rules and the law, as provided.

Costs of WRS

ZAMACE is empowered in section 5(2)(h) of the ACA, 2010 to charge fees for its services⁷. In this vein, ZAMACE has developed WRS related charges as shown in Table 9.

Table 9: ZAMACE WRS Charges

Fee	Metric	Amount (ZMW)
Warehouse Operator Certification	Annual fee per Operator	5,000
Warehouse Certification	Annual fee per site	2,000
Issue of WR	Per/MT	8.30
Change of WR ownership	Per/MT	3.00
WR Pledging ⁸	Per/MT	1.50

Source: ZAMACE

Stakeholders interviewed indicated that there was need to encourage more community aggregation. However, this implies inspection and certification of smaller storage infrastructure has to be done on a wider scale. Section 5(2)(a) of the ACA, 2010 empowers ZAMACE to classify storage infrastructure. An examination of the current charges brings out the need for classification and requisite charging as demonstrated in Table 10.

Table 10: Analysis of ZAMACE Warehouse Operator Certification Charges

Operator Size	Capacity	Sites	Licensing Fees			Licensing/MT		Licensing/Bag	
			WO	WO Site	Total	ZMW	US\$	ZMW	US\$
Large Operator	50,000	5	5,000	10,000	15,000	0.30	0.03	0.02	0.00
Medium Operator	20,000	3	5,000	6,000	11,000	0.55	0.05	0.03	0.00
Small Operator	200	1	5,000	2,000	7,000	35.00	2.92	1.75	0.15

Source: Author analysis based on ZAMACE WRS certification charges

Table 10 presents current cost structure for the certification of Warehouse Operators and their storage sites. Larger storage operators with numerous sites effectively spread the cost of certification resulting in a low cost per MT compared to smaller storage operators located at the community level. A medium to large operator with at least 5,000MT spread over several sites will pay as low as 1 US cent per 50kg bag and less in certification cost per annum compared to a small operators at the community level. For instance a 200MT storage operator at current charges incurs a cost of almost US\$3/MT and US\$0.15 per 50kg bag in annual certification fees.

⁷ "Charge, assess and collect fees for the examination or inspection of a warehouse and for the issue of certificates." S5(2)(h), Agricultural Credits Act, 2010

⁸ Financial institution pledging of a WR

However, all operators will be able to pass on the cost of certification to depositors in the year, though this will reduce their margins compared to the larger operators. ZAMACE should therefore consider offering a lower rate for certification of community storage operators.

Overall, we found that ZAMACE charges were slightly higher than what the industry charges when the cost of WR issuance is included. The costs translate to US\$5.30/MT for ZAMACE, and US\$4.17/MT for uncertified grain storage operators as shown in Table 11. Although the cost of the WRS for a certified warehouse operator seems higher than an uncertified operator, the value-addition from a certified warehouse operator in a system that is fully functional may justify the additional cost because of the following additional benefits:

- a. Ability to trade the WR on the commodity exchange
- b. Opportunity to access finance against the WR
- c. Additional security from provisions of the Agricultural Credits Act, 2010

Table 11: Comparison of Certified and Uncertified WO Charges

Charge	Certified Warehouse Operator /MT		Uncertified Warehouse Operator /MT
	ZMW	US\$	US\$
WR Issue	11.60	0.97	0.00
Handling-In	23.00	1.92	1.67
Storage	29.00	2.42	2.50
Total	63.60	5.30	4.17

Source: Author compilation

Table 11 presents results from an analysis of the cost of the WRS to a depositor over a period of 90 days. On average, the cost is US\$10.13 per MT for the entire period or a US\$3.38/MT monthly reducing the differential to US\$0.32/MT compared to storage for the same period in an uncertified warehouse⁹. There is however, room for ZAMACE to reduce its charges further to match those currently offered by uncertified warehouse operators if the volumes of certified warehouse receipts increases. Alternatively, they should be able to justify value for money to depositors based on the value-addition provided by the WRS.

3.5. Overview of the Functions and Operations of the FRA

The FRA was established in 1995 by the Food Reserve Act, No. 12 of 1995 and as amended by the Food Reserve Amendment Act, No. 20 of 2005. The 1995 Act repealed the National Agricultural Marketing Act of 1989. The functions of the FRA are outlined in section 4(2) of the Act as amended by the 2005 Act as follows:

- a. Administer the national strategic food reserve;
- b. Establish a market information system of stocks for the national strategic food reserve;
- c. Promote the use of approved standards of weighing and grading for designated agricultural commodities in accordance with the Weights and Measures Act and the Standards Act;
- d. Establish and conduct a programme under which storage facilities and equipment owned by the Government may be leased or sold;
- e. Assess storage requirements for marketing a designated commodity and plan for their establishment as needed; and
- f. Undertake such other functions as the Minister may assign to the Agency

⁹ US\$10.13 effective 90 days total storage rate = US\$3.38/MT which is US\$0.32/MT more than what is charged by an uncertified WO.

**Table 12:** Analysis of WRS Cost to Depositor for a minimum storage period of 3 Months

Depositor	WR MT	WR Issue Charge		WR Issue Cost ZMW	Storage Charge (ZMW)		3 Month storage ZMW	Total Cost		Effective US\$/MT
		/MT	/Bag		/ MT Monthly	Handling In / MT		ZMW	US\$	
Larger	1,000	11.6	0.58	11,600	29	23	110,000	121,600	10,133.3	10.13
Medium	500	11.6	0.58	5,800	29	23	55,000	60,800	5,066.7	10.13
Small	100	11.6	0.58	1,160	29	23	11,000	12,160	1,013.3	10.13

Source: Authors analysis based on ZAMACE charges

There were some notable amendments in the functions of the FRA under the 2005 Act. The requirement for traders and processors to register and report stocks was deleted. Also, under the 1995 Act, FRA was prohibited from engaging itself in the purchasing, importation, sell or trade in any agricultural commodity, but with the amendment, this condition was relaxed to allow purchase, sell or trade. Thus the restriction was lifted with the amendment of section 4(4) as follows:

“The Agency shall, in addition to such other actions as may be necessary to administer the national strategic food reserve, purchase, import, sell or trade in a designated agricultural commodity.”¹⁰

3.5.1. National Strategic Food Reserve

The principal operations of the FRA as designated by the Act is to procure and manage the National Strategic Food Reserve. Part III of the Act in section 5(2) gives the purpose of the reserve as follows:

- Ensure a reliable supply of designated commodities for the country;
- Meet local shortfalls in the supply of a designated commodity;
- Meet such other food emergencies caused by drought or flood, or by such other natural disaster, for the purposes of this Act, as may be declared by the President;
- Correct problems relating to the supply of designated commodities which result from the manipulation of prices or monopolistic trading practices.

The Minister of Agriculture is empowered by section 6(1) to designate any cereal, oilseed, stock feed and any other agricultural food commodity that he deems essential for the food security of the country. This has to be done prior to October 31st of each year.

3.5.2. Procedures for Procurement of the SGR

The Act makes it mandatory for the FRA to follow prescribed processes in its arrangements to procure the Strategic Grain Reserve (SGR). FRA is required in section 7 to announce in the Government Gazette and print media prior to 1st May every year its plans for SGR purchases. The plan is required to include: quantity of the commodity, method of procurement, payment, and places at which the Agency intends to make purchases. The FRA is also required in section 8 to publish in the Gazette and in the print media prior to 31st October of every year the procedures to be followed in the proceeding twelve months in selling any designated commodity held as part of the SGR. Section 8 also allows the FRA to sell part of the SGR to rotate or distribute the reserve.

¹⁰ This amendment has been attributed to the disruptive effect of FRA's intervention in the market

3.5.3. Marketing and Trading of Designated Agricultural Commodities

The 2005 Act introduced an amended Part IV of the Act which empowered the FRA in section 10 to engage in marketing and trading of designated agricultural commodities. This section makes it mandatory for the FRA to identify and enter markets in rural areas where involvement by the private sector is minimal and operate through established market centers in rural areas or farmers' organisations (section 10(2)).

Part VI of the amended Act mandates the FRA to manage, lease and maintain its storage facilities and equipment for use for designated agricultural commodities. Section 15 also specifically requires the FRA to collaborate with other institutions to facilitate the operations of markets and agribusiness activities

3.5.4. FRA Interface with the WRS

There is no current proposed interface of the FRA with the WRS although the Agency in Part IV – Crop Marketing of the 2005 Act is mandated in section 11 to inspect documents to ensure that supplied commodities are not subject to an agricultural charge as provided in the Agricultural Credits Act. There is therefore an envisaged interface with the ACA, although this was intended in the 1995 Act, as the provision holds true for the replacement in the 2010 Act. A further examination of the Food Reserve Act of 2005 reveals an intended linkage to the WRS in section 11, where the Agency is required to maintain a market information system for the benefit of actors in production, marketing, and processing of designated agricultural commodities in consultation with them.

In Part VI of the 2005 Act – Management and Lease of Storage Facilities and Equipment, the Agency is required to manage, lease and maintain such storage facilities and associated equipment for designated commodities when it deems it necessary. Of particular interest for the WRS is section 15 which deals with agri-business. The Act states as follows:

1. The Agency shall collaborate with other institutions to facilitate the operations of markets and agribusiness activities.
2. In this section, "agri-business activities" include—
 - a. the operation of a system where a farmer obtains inputs on credit and agrees with the lender to recover the loan in full from the sale of the farmer's produce, and pay the farmer the difference, if any, for the recovery of credit; and
 - b. the maintenance of a system which allows a farmer or any person to obtain credit against agricultural commodities held in a bonded warehouse.

The Food Reserve Act, 2005 provides an interface for the FRA to be aligned to and utilise the WRS. One way in which the FRA can contribute to the development of a functional WRS is by certifying some of its storage in the major production areas includes rural areas where there is active private sector activity and also facilitate agri-business activities. As mentioned earlier, FRA's deliberate alignment to the operations of WRS will help bring about confidence in the market and the use of WRS. The FRA Act may need further amendments to spell out clearly how the government through the Agency will interface with the system particularly in terms of the size of SGR, stock rotation and trading on the commodity exchange. Such clarity will help boost the development of the system. The WRS offers an opportunity for the FRA to reduce its financial requirements to manage the Strategic Grain Reserve (SGR) as the public-private sector partnership through FRA certified storage could generate revenue for the Agency. For example, assuming that FRA commits to have 20 percent of the current 500,000MT under its own certified storage at a fee of US\$2.5 per MT per month, the agency could generate at least US\$250,000/month¹¹.

¹¹ These components include administration, licensing and oversight of warehouses, contractual rights and obligations of the parties, negotiation and transfer of warehouse receipts; warehouse receipts: legal status, format, details, form and registration, settlement and release of stored goods, and execution and priority of obligations, offences and penalties.



4. Constraints to the successful implementation of the WRS

The study found that four broad themes of issues contribute to the under-development of the Zambian WRS. These can be categorised as; unpredictable and inconsistent policies, inadequate/missing legislation, inadequate WRS support infrastructure, and an unenthusiastic financial sector. These issues are discussed in detail in this section.

4.1. Inadequate/missing legislation

There are inconsistencies in some of the laws, especially the most recent Acts of Parliament. Some supportive laws which should have been part of the total package for a functional WRS have not been enacted and have stalled as draft Bills. Further, the Government's policies tend to be both unpredictable and inconsistently applied adversely affecting private sector planning and investments.

4.1.1. Misaligned and Missing Legislation

Current legislation seems fairly sufficient to support the development of the WRS, with the critical components¹² covered (i.e. These components include administration, licensing and oversight of warehouses, contractual rights and obligations of the parties, negotiation and transfer of warehouse receipts; warehouse receipts: legal status, format, details, form and registration, settlement and release of stored goods, and execution and priority of obligations, offences and penalties). However, some gaps remain, , we find that presently, WRs generated under the Agricultural Credits Act of 2010 can only be traded through a Securities and Exchange Commission (SEC) licensed exchange (i.e. LuSE). This arises from the fact that the Securities Act of 2016 recognises a WR as a financial security. Because ZAMACE is not licensed nor regulated as an exchange given the absence of a regulatory framework for commodity exchanges in the country, this raises legitimacy questions around ZAMACE's operations as a commodity exchange. However, this in no way curtails its operations as there is nothing that stops the exchange from offering its services. The Commodities Exchange law needs to be enacted to provide more clarity to the market.

The Commodities Bill was drafted in 2012 by a consultant in collaboration with the SEC and support from Musika. However, it was felt that since the Securities Act of 1993 was undergoing revision, the Commodities Bill provisions would be infused into one Act. Unfortunately, this was not done although there is a new Securities Act. The Securities Act of 2016 only mentions WR and commodity in its definitions, and no cross-referencing to the ACA is made. Some stakeholders proposed that it may be cost effective to incorporate appropriate elements of the Commodities Bill into the revised Securities Act instead of just stopping at the definition.

Furthermore, there are other draft bills that could enhance commodity trading and government decision-making around grain marketing, but a number of these have stalled. For example, the Agricultural Marketing Bill has not been enacted despite a recommendation for its enactment by the Parliamentary Committee on Agriculture. The Agricultural Marketing Bill, if enacted would facilitate an efficient private sector driven agricultural marketing system in the country. The key elements of the proposed legislation was to provide for a Marketing Council, which would be a Private Public Partnership (PPP) institution, comprising public and private sector representatives whose role is to facilitate a level playing field for all market players. The diverse group of experts from both the private and public sectors would be much more appropriate and better placed to tackle market challenges in a holistic manner than any single player in the market. In addition, the proposed Act was intended to help promote effective coordination between the private and public sector through greater consultation and transparency with regard to changes in FRA purchase and sale prices, import and export decisions, and triggers for release of stocks. It was envisaged that once this legislation was in place, agricultural marketing and trade would be based on transparent and predictable set of rules and regulations, a situation that is likely to bring in more private investments and participation in the sector, and in particular WRS.

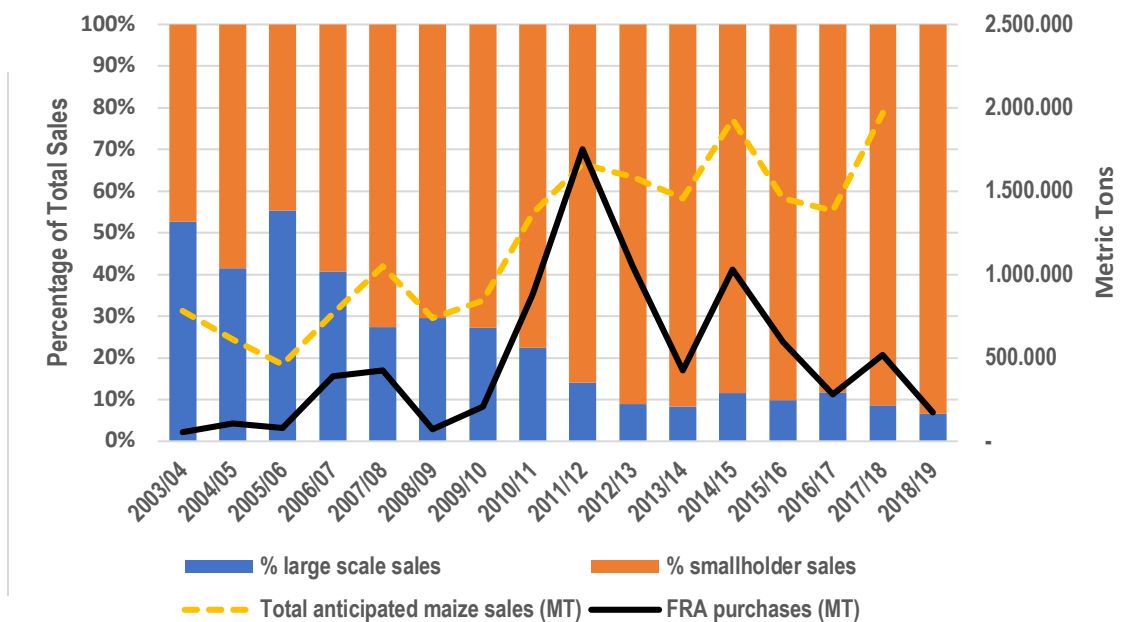
¹² These components include administration, licensing and oversight of warehouses, contractual rights and obligations of the parties, negotiation and transfer of warehouse receipts; warehouse receipts: legal status, format, details, form and registration, settlement and release of stored goods, and execution and priority of obligations, offences and penalties.

4.2. Unpredictable and Inconsistent Policies

4.2.1. Unintended Effects of FRA Market Participation

The revisions of the Food Reserve Act in 2005 to allow FRA to participate in marketing and trade of designated agricultural commodities has had profound negative impacts on the growth of the grain marketing sector (see Chapoto and Jayne, 2009; Chapoto, 2012; Mason and Myers, 2011). FRA purchases and disposal of SGR has in some years affected the smooth operations of the market. FRA has in a number of years purchased over and above the prescribed SGR of 500,000MT, even when the Agency had huge carryover stocks. Figure 5 shows total anticipated maize sales from all farmers, FRA maize purchases and the anticipated sales from smallholders and large scale farmers. As can be seen from this graph, FRA's purchases have not been consistent as they fluctuate from year to year creating an uncertain market environment for private sector.

Figure 5 : FRA Maize Sales and Purchases (2003-2019)



Source: MoA/CSO various years.

The other main issue that the stakeholders raised had to do with the failure of FRA to provide clear market signals on the timing of its entry into the market for purchasing maize, as well as offloading of SGR maize to millers. Although it is the latter that has proved more problematic, the former also creates undesirable effects on the market because the FRA is a large player and its buying price is perceived as the “floor price”. In big surplus years, the majority of the smallholder farmers normally start selling their maize only after FRA has announced its buying price, an indication that FRA holds an important position in the market. Unfortunately, this price is pan-territorial and pan seasonal, making it depart from tenets of the market based pricing that relies on the demand and supply situation. Hence, FRA pricing not friendly to the operations of WRS and commodity exchange given the volumes involved. Therefore, stakeholders recommended that FRA should embrace a floating market based pricing system, and to avoid any political interference in maize grain pricing, the Agency should be allowed to become a player on the commodity exchange when procuring and rotating the SGR stocks. FRA participation would have to enhance the establishment of a credible and transparent price discovery platform that all market players can utilize for the benefit of the producers. It is worth mentioning that the FRA's maize purchases have trended downwards in the last five years (Figure 5). If sustained, this would help attract more private sector participation in the grain sector. If FRA has carry-over stock they should only procure the balance required to attain the SGR and not to add 500,000 MT every year regardless of the size of the carry-over stock.



During the stakeholder consultation meeting with key stakeholders including FRA, it was noted that one of the major problems facing the market and a critical issue that will hinder the development of WRS or commodity exchange has to do with FRA stock disposal to millers as part of its price stabilization strategy and rotation of old stock. The disposal of the SGR stocks is usually done at below-market prices and at a time when private traders are ready to supply grain to the same millers. The impact has been devastating because selling maize at a loss after storing it for a few months means the traders are not able to repay their loans and would not be able to buy grain from the smallholder farmers in the next season. A situation requiring FRA to step in again to fill the void left by the exiting traders. When FRA sells at prices which do not reflect carry costs or its efficiency in grain storage, the resultant effect is market price distortion which is not conducive for the development of the private sector, and impedes on the well-functioning of the WRS. **Thus, FRA activities impede the growth of investments in storage facilities by the private sector because the gains from storage are destroyed by below market prices.**

Figure 5 also shows an obvious decline in maize production among commercial farmers and hence a significant drop in the proportion of maize sales supplied by this category of farmers. This is also one of the negative impacts of FRA's strategy of buying-high and selling-low. **Most commercial farmers have been opting out of maize in preference for other crops such as wheat and soya beans, where there is less interference by the government.** With over 90 percent of the maize production and supply of maize now in the hands of smallholders, it means the success of the WRS lies in enhancing smallholder grain aggregation systems and community warehouses for onward delivery to medium and large certified warehouses. Nevertheless, for the WRS to become robust, there is need for the commercial farming sector to take part because they are more resilient to production shocks compared to the smallholders. Most of the large commercial farmers have the ability to offset some of the risk through better management and irrigation.

FRA policies have exerted a huge fiscal burden on both the national and agricultural budget in the country. The money used to buy grain comes from commercial lenders, thus imposing an opportunity cost to the growth of other sectors within and outside agriculture. There is clearly a crowding out effect in the commercial financial markets created by the government when they borrow money to finance maize related purchases under the FRA. Other costs arising from FRA operations are the quality losses in maize that are incurred by the Agency when it buys above the SGR. Also, FRA has since expanded its storage capacity to over 1,000,000 MT. However, this policy fails to take advantage of private sector appetite to build new storage or lease current FRA storage.

Ongoing Review of Food Reserve Act, 2005

The Government embarked on a review of the Food Reserve Act of 2005 in 2018. It was gathered from the discussions with the MoA officials that a revised Bill would be submitted to parliament for discussion in 2019. However, the contents of the revised bill have not yet been made public after the initial engagement of the stakeholders in late 2018. One of the biggest problems caused by FRA activities relates to the timing of stock rotation and the price at which this is done. This problem needed to be addressed head-on during the review if the WRS and commodity exchange is to work efficiently. Below is a discussion of the list of proposed amendments and general stakeholder response.

Amendment 1: To amend 4 (2) (a) in the Act that provides for administration of the national strategic food reserve. Amendment to define national strategic reserve and designate the strategic facilities as strategic locations

The principle behind the amendment was deemed reasonable by stakeholders but indicated that it was very important to specify in the revised Act the commodities and corresponding volumes that will contribute to the strategic reserve. Also, there was need for a provision in the Act to allow periodic revisions of the volumes to ensure there was consistency in the market and prevention of price destabilisation.

Amendment 2: Allow the Agency to engage in business ventures for profit under a Public Private Partnership (PPP) model

Stakeholders disagreed with the proposals under this amendment as the reasoning behind them were fundamentally flawed. In particular, the proposal was going against key commitments from the Government to reduce their involvement in the agriculture sector, and specifically maize markets. For example, the 7NDP states "In addition, the Government will reform the Food Reserve Agency away from commodity marketing to focus only on strategic food reserve purchases" and the ruling Party's Agriculture Manifesto states "the PF government shall: ... promote the participation of the private sector in agricultural commodity markets...[and].... Review the FRA Act so as to make the FRA buyer of last resort and strictly for National Strategic Reserves, and to curtail the offloading of FRA maize on the local market, except during extenuating circumstances such as the need to ensure availability of the commodity and price stabilisation".

In addition, the proposal did not provide any evidence to suggest that the proposals would result in sustainable revenue for the FRA. Evidence from across the region and Zambia's own history shows that when a Government takes the lead in agricultural markets, the results have been disastrous for the farmer, the consumer and for the public finances (as the experience of NAMBOARD demonstrates). The bigger the role of Government, the bigger the market distortion, and the more it undermines the private sector's involvement.

Amendment 3: Amendment to section 4 (2) b and c for the establishment of a market information system through the Agency where all other stakeholders will be required to be registered with the Agency

There was general agreement that the proposal for an effective and sustainable market information system was long-overdue. However, this should not be the preserve of the FRA. Instead, there was a need for an independent organisation capable of collecting information from the agency and the private sector for the benefit of the market. There has been some progress made in terms of the establishment of ZAMACE after the passing of the Agricultural Credits Act 2010 and increased participation of private sector in grain markets and this required an independent, transparent and accessible market information system to sustain it. In terms of funding, such a system should not be through registration fees to FRA (or to any other organisation). Rather, innovative funding systems should be considered. For example, a transaction levy via ZAMACE or a small charge on commodity transactions over a certain volume say 20 tonnes. Using an automated system such as ZAMACE would support reductions in the burden of doing business in Zambia.

The amendment in relation to weights, measures and standards was no longer relevant. ZAMACE had led work to harmonise a system of weights and standards and such a private sector led development needed to be given space to grow.

Amendment 4: Amendment to section 4 (e), establishment of storage infrastructure in designated locations

The private sector has the capacity to build new storage, so rather than providing new facilities directly, the Government should instead incentivise the private sector to build storage in areas where it is lacking. This storage should focus on growing new markets and providing storage to support trade. Current FRA storage capacity amounts to over 1 million MT. The Act and agency should focus on rehabilitating this storage and ensuring it meets required warehousing standards. With the exception of designated strategic reserve locations, these facilities should be available for the private sector to lease.

Amendment 5: Amendment of section 10 – Reduction of buying points and allow the Agency to export designated commodities

This amendment was viewed as very broad and mixed a number of important points. The amendment seems to suggest decreasing the number of buying points, but at the same time increasing the FRA's remit to become an exporter of commodities. The rationale suggested that this will enable the FRA to both stabilise the market price, reduce costs and raise revenue from exports. Unfortunately, there is no evidence from across the region



to suggest that could be successful. It was not clear how reducing the number of buying points will support the FRA's mandate to deliver a strategic reserve and ensure food security in Zambia. Also, the assumption that the FRA would be a commercial entity and at the same time continue to serve the social function of managing SGR was not seen to be realistic.

Amendment 6: Amendment of the Act to allow for alignment of the financial year and allow FRA to retain portion of funds from sales of commodities

There are no objections to aligning the FRA's financial year to the Budget cycle. However, for the amendment authorising FRA to retain a portion of funds from the sales was not in line with the purpose FRA was set up. Stakeholders reiterated that there was no need for FRA to assume the role of a commercial entity and therefore retain funds from sales as proposed. Instead, all funds should be returned to the Treasury. Other innovative options of ensuring timely release of SGR funds would be to consider a national strategic reserve fund where the sales revenue could be deposited.

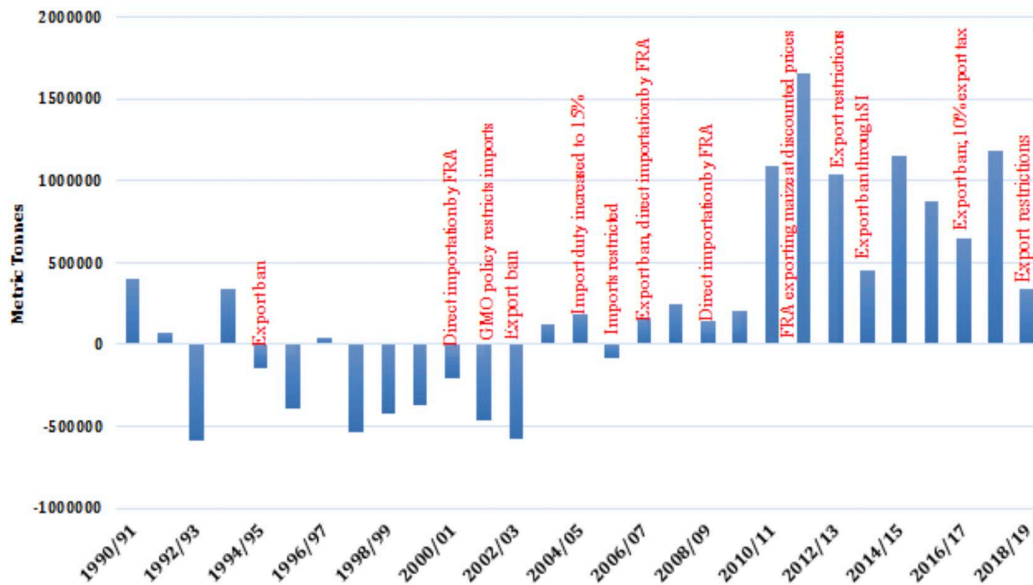
Amendment 7: FRA to seek to enhance Corporate Governance

Last but not least, stakeholders welcomed the proposal for reforms to the governance structure provided that they supported the current mandate of the FRA and conform to the Proposed Agricultural Marketing Bill. It was also noted that FRA would not be able to reform itself, hence there was need for an independent review by a panel of experts drawn from both government and private sector.

4.2.2. Grain Trade Policy

Zambia's stop-go trade policies have had negative impacts on the development of the maize sector and curtailed progress of establishment of a vibrant WRS. Figure 4 shows that Zambia has moved from being a deficit maize producer to a net exporter and yet the implementation of export restrictions has continued. In the last 5 years, there have been at least two major periods when export bans have been implemented; 2012 to 2014, and 2016 to 2017. The period 2012 to 2014 was characterized by large maize surplus production, with FRA purchasing maize significantly beyond strategic reserves, holding the majority of the maize stocks on the market and the implementation of subsidies to millers.

The export bans therefore, were in response to price spikes arising from a number of structural factors including the fact that the FRA centrally held the majority of the maize and could not effectively distribute it when required, particularly in the far-flung areas (Sitko and Kuteya 2013). The export restrictions implemented between 2016 and 2017 were related to the weather shocks. The El Niño weather patterns that covered much of Southern Africa led to serious maize deficits in the region putting pressure on Zambia's maize, and resulted in price increases. At that time, Zambia was the only country in the region with sufficient maize (Chisanga et al. 2017).

Figure 6: Maize Surplus/Deficits and Trade Policies (1990-2019)


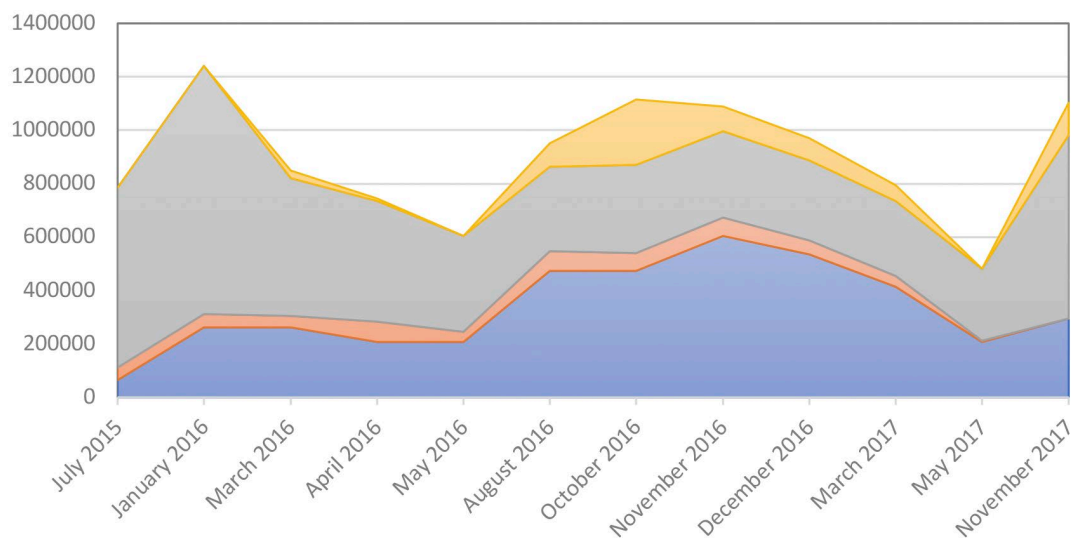
Source: Authors' representation using MoA/CSO Various Years; Nkonde et al. 2011.

The private sector has demonstrated the ability to purchase and store significant proportions of marketable surplus maize as well as transmit the high market prices to farmers. In a number of seasons, including the 2018/19 marketing season, the private sector has out-bid the FRA, buying more and offering higher prices.

Figure 7 shows the stocks of maize held by different stakeholders between July 2015 and November 2017. For example, during the 2016/17 season, the private sector had outbid FRA to procure the bulk of the marketable surplus. However, later in the season, an export ban was imposed on the premise that the country was not food secure given that FRA had failed to reach its buying target. The huge carryover stock at harvest meant that the farmers had to bear the brunt of maize price crash. This only goes to show how policies have a profound impact on the market. Hence, dealing with inconsistent and ad hoc grain trade policies should be a priority if the WRS and commodity exchange are to develop and work efficiently.



Figure 7: National Maize Stocks Held by Different Stakeholders¹³



Source: Stocks Monitoring Committee Various Years.

4.2.3. The Rising Cost of Doing Business

With a desire to rationalise the tax system and raise more money for the country, the Zambian Government has introduced a new tax regime including Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA), and Cost of Goods Tax. These taxes are likely going to increase the cost of doing business in the agricultural sector. The Zambian government in the 2019 national budget address announced that the value-added tax was going to be replaced with a sales tax, as well as lower the tax credit for interest from 100 percent to 30 percent of EBITDA. While these measures could increase government revenue and save the government from making VAT refunds to many sectors especially mining, the potential impact on the agricultural sector if not exempted would be big. This is because sales tax cannot be claimed, unlike previously, where zero-rated VAT expenses were refundable on designated intermediate inputs.

The reduction of the deductible amount on EBITDA from 100 percent to 30 percent is likely to result in diminished ability of agribusinesses, traders and farmers to borrow and finance their operations. Related to commodity trading, most traders have to borrow funds to finance the purchase of stock from farmers with the intention of storing the grain and delivering it to buyers when supplies are low. Therefore, a reduction in the amount of EBITDA to be deducted will mean the cost of doing business for these commodity traders will increase, eating into the little margin that they currently make. This means the development of the WRS and commodity exchange is likely to be curtailed if this change is extended to the agricultural sector.

4.3. Inadequate WRS Support Infrastructure

4.3.1. Inadequate Certification Unit

The study found that ZAMACE has over the years scaled down its human capital in tandem with its reduced operations and funding. Currently, the staff compliment is only two people which comprise the Executive Director and an assistant. Meaning the two people have to perform all the function that ZAMACE is supposed to do, including warehouse certification. For example, the Executive Director does the promotion, receives applications, inspects,

¹³ ZNFU, FRA, GTAZ, MAZ refer to the Zambia National Farmers Union, Food Reserve Agency, Grain Traders Association of Zambia, and Millers Association of Zambia respectively.

certifies and provides oversight on warehouses' functions that should be performed by an Operations Manager. Before the Agricultural Credits Act of 2010 was passed, this position was supported by a cooperating partner. After the appointment of ZAMACE as the Authorised Agency, this support ceased with the hope that the private sector would take over and support staff from trading activities. Unfortunately, the trading activity has been limited and this affected the staffing and operationalisation of WRS and commodity exchange.

It was noted from grain traders and storage operators interviewed in this study that the availability of storage was not a major challenge as the private sector could easily expand their existing capacity if there is increased demand for certified storage under the WRS.

As discussed earlier, the WRS for maize will initially have to rely mostly on smallholder farmers because the large scale commercial farmers have cut down their production of the crop. This suggests that more community-level aggregation centres need to be established. However, capacity in warehouse management around the country was found to be lacking. Existing qualified warehouse managers were only limited to the large grain traders and processors. This is an area that would require immediate attention.

4.3.2. No Structured Reporting between ZAMACE and Ministry of Agriculture

Discussion with ZAMACE and MoA management revealed the absence of a structured reporting framework where the Authorised Agency (ZAMACE) that would regularly appraise the MoA as the appointing authority about the operations of the WRS and performance on the regulatory role. The lack of financial resources to perform its basic functions meant that ZAMACE could not have a structured plan of reaching out to the market and sensitising it about the WRS. For example, the Ministry expected ZAMACE to proactively participate in agricultural shows jointly with them. But as mentioned earlier, the operations of ZAMACE have been affected by the lack of trading, a pre-requisite for its strength and survival.

4.3.3. Inadequate Business Development Skills amongst Smallholders

Previous experience around WRS development in Zambia shows that smallholders face challenges to facilitate effective participation in the system. Lessons learnt about innovations around this as demonstrated by the ZAMACE-GMEP programme could help fast track smallholder participation. Farmer groups and associations were active as a means to access subsidised inputs through the Farmer Input Support Programme (FISP) and not as a long-term sustainable business arrangement. They ultimately struggle to sustain the business case which affects their pricing expectations and inhibits their ability to organise themselves to establish strength in the market by aggregating their produce from the community level. This impedes their access to the commercial market and the development of a series of community based aggregation points.



4.3.4. Unharmonised Quality Standards

The standards in use among grain market actors are largely ZAMACE standards, however, as per best practices, Zambia must move towards the use of national standards (see Lacroix and Varanguis 1996). This is especially important given that ZAMACE standards are different from national standards under the Zambia Compulsory Standards Agency (formerly Zambia Bureau of Standards - ZABS). Moreover, local standards irrespective of source are not harmonised with regional standards such as the East African Community (EAC). Table 13 demonstrates these anomalies. ZAMACE standard is out of sync with both the ZABS and EAC standard on the allowable defective grains. This parameter alone was in the recent past used to reject Zambian grain exports to East Africa. Therefore, to have an effective nationally and globally acceptable WRS, it is important that these standards are harmonised and held by a recognised regulator such as ZABS.

Table 13: Comparison of ZAMACE, ZABS and EAC Maize Standards

PARAMETER	Unit of measure (UOM)	ZABS	ZAMACE	East African Community (EAC)
Moisture	%	12.5 max	12.5 max	13.5 max
Extraneous matters	%	1.0 max	1.0 max	0.85 max
Broken Grains	%	6.0 max	6.0 max	2.0 max
Other Coloured grains	%	3.0 max	3.0 max	2.0 max
Total other Defective grains of which:	%	9.5 max	11.0 max	4.0 max
a. Discoloured grains	%	1.5 max	3.0 max	0.5 max
b. Insect/pest damaged grains	%	2.0 max	3.0 max	1.0 max
c. Diseased grain	%	1.5 max	2.0 max	2.0 max
d. Immature or Shrivelled grain	%	1.0 max	1.0 max	1.0 max
e. Fungal damaged grains	%	-	0.5 max	-
f. Germinated grains	%	-	NIL	-
g. Pass through a 6.35mm sieve	%	2.0 max	1.5 max	-
Diplodia	%	-	NIL	-
Fusarium/Fumonisin	%/ppm	2 max	0.5 max	2 max
Aflatoxins	ppm	10 max	-	10 max
Aflatoxin B1	ppm	5 max	-	-

Source: Compiled from ZAMACE/ZABS/EAC standards

4.3.5. Inadequate Trading Platform

ZAMACE was restructured to facilitate commodity trade based on WRs. This was intended to act as a transparent price discovery mechanism and trade information dissemination platform. Strides have been made in having an in-house trading platform developed. The current set up is able to submit bids and offers but due to financial constraints the automated order matching and settlement modules were not developed. Hence, the ZAMACE trading systems are not in conformity to the regionally and globally accepted standards of an exchange trading and settlement system. This works against the further development of the WRS as stakeholders do not have full confidence in the Exchange platforms as a facet of an integrated WRS.

Whereas, ZAMACE excels with its WRS management and WR issuing and monitoring system, it is found wanting on its ability to transparently and seamlessly conduct its trading activity. The LuSE in its request for proposals (RFP) for the upgrade of its systems included the ZAMACE trading procedures, LuSE (2015). The result of this RFP was the upgrade of the LuSE trading and depository system to the Securities Trading Technologies (STT) system which gave the LuSE the ability to conduct trade in commodities (Lusaka Times, 2018). However, the commodity trading module remains unutilised. Also, ZAMACE and the JSE signed an agreement to offer Zambian delivered grain derivatives in 2014 but the roll-out has been slow especially that no sizeable grain has been deposited in certified warehouses.

4.3.6. Grain Information Service

The lack of a grain market information service in the country contributes to unfavourable market policies, especially around maize, and this needs to be addressed to support WRS development. This service would provide market information on production, stocks and processing demand and processed products for key commodities. The current model relies on periodic stakeholder meetings at the MoA, who declare stocks in a very informal manner, to give a sense of the availability and commitment of stocks. This information is for Ministerial planning purposes only leading to the perpetuation of asymmetry of information in the wider market. The accuracy of the submitted information under the Stock Monitoring Committee is also not certain.

There are proposals under the FRA Act to Amend section 4 (2) b and c, to establish a market information system through the Agency, but stakeholders would want to have an independent and a transparent system. The USAID Southern Africa Trade and Investment Hub (USAID- SATIHub) initiated support for the Zambia National Farmers Union (ZNFU), Grain Traders Association of Zambia (GTAZ) and Millers Association of Zambia (MAZ) to establish the Zambian Grain Information Service (ZAGIS) in September 2017. These attempts at establishing this service stalled, as the letter to authorise ZAGIS to collect information on behalf of the Central Statistical Office (CSO) was not granted. ZAGIS remains a critical ingredient for the development of an effective WRS and commodity exchange.

4.4. Unenthusiastic Financial Sector

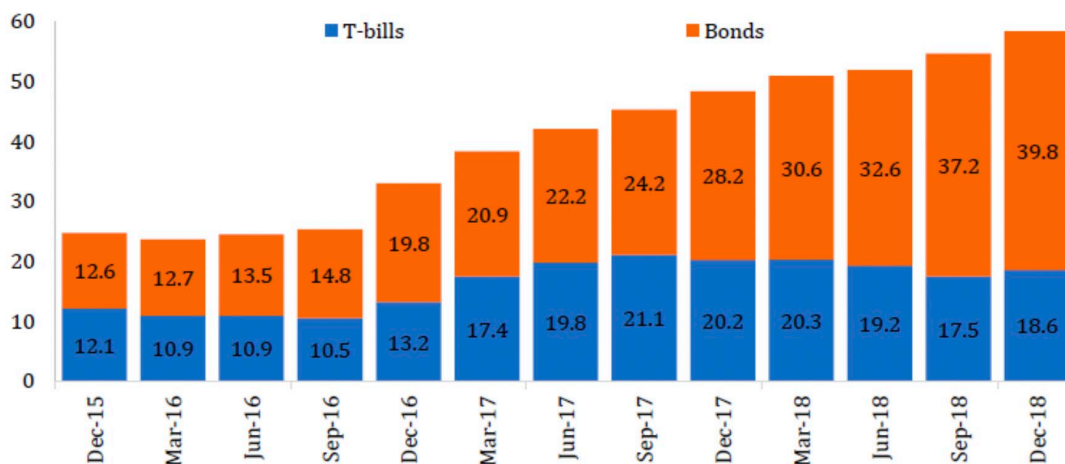
4.4.1. Warehouse Receipt Financing and the State of the Financial Market

The WRS is expected to facilitate access to finance particularly by smallholder farmers through their aggregated commodities. The financial sector has, through the Agricultural Credits Act, 2010, what they had in the past been seeking – recognition of the WR as a document of first title. However, grain trade policy has resulted in the sector incurring losses in its financing to traders in the 2015/16 season. This has made the financial sector, especially the commercial banking sector, to be apprehensive about financing agribusiness until the direction of Government policy is certain.

The lending behaviour of financial institutions is affected in part by the overall situation in the money market. The government continues to be active in the money market crowding out the private sector. The stock of government securities increased to ZMW 58.4b billion as at the end of 2018 from K24.7 billion three years ago. It is however noteworthy that the Government has toned down on using short-term securities to raise funds opting for longer term instruments as can be seen in Figure 8.



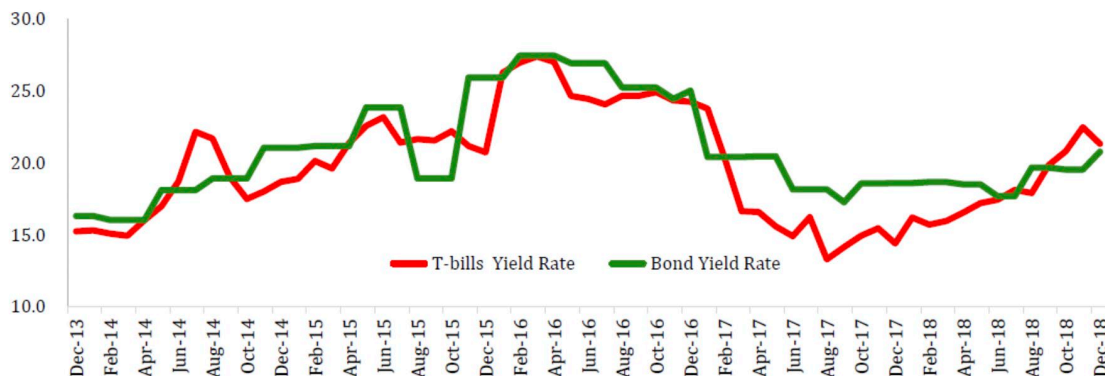
Figure 8: Total outstanding Treasury Securities



Source: Bank of Zambia, 2019

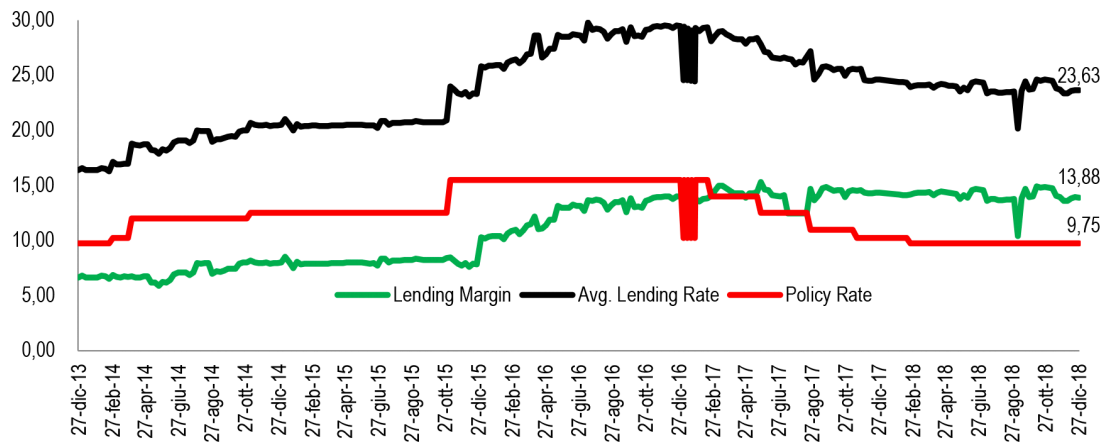
A review of the weighted average yield rates on government securities shows that the securities closed the year 2018 at 21.5% and 20.8% for Treasury bills and government bonds, respectively. These risk-free rates provided the basis for pricing in the financial market. For instance, most corporate bonds listed on the LuSE typically use the 182 day Treasury Bill rate as the base rate plus a margin. The increase in the government's borrowing appetite at higher rates pushes up the base interest rates expected in the financial sector and has the tendency to stifle financial sector innovative product offering as premiums for such products will tend to be high.

Figure 9: Government Security Yield Rates



Source: Bank of Zambia, 2019

In April 2012, the Central Bank introduced the Monetary Policy Rate (MPR), as a measure to exert more control on lending rates in as much as it was in line with the developments in monetary policy management principles in other African countries (IMF, 2017). The BoZ therefore directed commercial banks to align their base lending rates to the MPR (BoZ, 2012). The effective commercial bank lending rate is therefore MPR + Margin. The margin is informed by each respective commercial bank's views on lending rate influencing factors such as the borrower's risk profile.

Figure 10: Commercial bank average lending rate and Monetary Policy Rate

Source: Author compilation of BOZ data

In 2018, the average commercial bank interest rate closed at 23.63% representing a lending margin of 13.88% and MPR of 9.75%. The Central Bank stated in its Monetary Policy Committee (2019) that high lending rates continue to constrain the extension of credit to the private sector coupled by weak asset quality in the financial sector reflected by high non-performing loans.

4.4.2. Inadequate Innovative Financing Products

Zambia has one of the highest costs of finance in the region and getting the WRS to work will require facilitating access to low-cost financing. Currently, there is lack of innovation in the provision of financial solutions on the backdrop of high yielding government risk-free securities. The larger traders source relatively cheaper long term funds from their regional headquarters, parent structures, or from investment funds.

4.4.3. Inadequate WRS Awareness and Skills

It was established from some of the financial institutions that what has been perceived to be the lack of proof-of-concept is actually inadequate awareness and skills in WRS and WR financing which is deemed to be risky as a relatively new instrument on the market. The current skills set and awareness levels are skewed towards a collateral manager who assumes the risk of vetting the procedures for grain procurement, handling and storage on the back of their standing as a recognised collateral management firm, as opposed to a series of warehouse operators certified by ZAMACE. Financial institutions are generally not aware of how the WRS operate and the inbuilt safeguards to confidently embrace WRs and their financing.

4.4.4. Lack of a Credit Guarantee Structure for WRs

The Zambian financial sector is generally risk-averse and are likely to be more attracted to enter a perceived new market if they had some safeguards such as a credit guarantee structure which compensates them for part of a loss should it occur. There has been no such structure to build confidence in WR financing for those looking to test the waters. Current input finance options linked to WRS are by traders such as Moomba Investments and ETG who encourage farmers to deposit their produce and access inputs based on the value of the deposited commodity.



5. Conclusions and main implications

In recognition of the high impact of market-related risks in Zambia's agricultural sector, and potential of the WRS to address some of these, this study sought to identify gaps in the successful operationalisation of the Zambian WRS. Our findings show that the regulated WRS in Zambia remains largely unoperationalised despite the existence of infrastructure and an enabling environment to facilitate development. Collateral management is the dominant form of warehouse receipting in operation, largely by commercial farmers and multinationals. However, receipts issued under this are not tradable and this is despite the existence of government and private sector storage infrastructure around the country, and the existence of certified warehouses for WRS. A number of factors explain the status quo, including limited awareness among potential users, capacity constraints by the promoter and regulator, and the lack of confidence in the WRS among players. Another factor relates to disabling policy actions emanating from government activities around maize, the widely produced commodity in the country. Potential commodities under the WRS include **maize, rice, white sorghum, cashew nuts, edible beans** (of which sugar beans is emerging as a very important cash crop), **seed cotton, and groundnuts**. However, the production levels are still low, and value chain development activities must accompany any interventions to spur production. Based on the gap analysis, we draw the following recommendations:

Legislative Review

Legislation governing the WRS needs to be reviewed, there are gaps such as the effective illegality of ZAMACE trading issued WRs as ZAMACE is not currently a licensed exchange. Further, there are legitimacy concerns around ZAMACE due to the absence of a regulatory framework for exchanges in the country. The lack of a grain marketing council and grain information service leaves important market decisions at the mercy of politicians. To promote market development, the agricultural marketing bill among other draft bills, needs to be reviewed and enacted. Further, the FRA Act of 1995, 2005, and the draft reviewed bill need to be reviewed to understand how the mandates of FRA would change and how proposals could impact the WRS.

Then is also an urgent need to review and harmonize the Agriculture Credit Act of 2010 to talk to other legislations such as FRA Act, Standards Act, Securities Act, and Moveable Assets Acts. The Warehouse Licensing Authority and the relevant Board need to be established in accordance with S3 and S7 of the Act respectively. Consideration should be given to enacting a standalone WRS Act.

Political Economy of Strategic Crops

It is clear to that decisions around the FRA are above the Ministry of Agriculture including its Permanent Secretary. Instead, the President and Cabinet hold the key to changing the status quo. One starting point would be to get the Ministry of Finance to buy into the idea of agricultural market reforms given the fiscal challenges currently obtaining. Usually, the Minister of Finance experiences very little inertia from other Ministers. The same strategy can be used to get the FRA to begin to move away from distortionary activities by first moving towards certification of some of its storage, and potentially using the private sector to secure a proportion of the strategic grain reserves.

Support Collaboration of ZAMACE/LuSE

The current proposed collaboration between ZAMACE and LuSE should be supported as it will strengthen ZAMACE's trading platform. LuSe's established exchange with its core systems and upgrade plans would be extended to ZAMACE, which currently does not possess the capacity and financial ability to deploy on its own. In addition, ZAMACE would benefit from shared resources such as accounting, marketing, administration and goodwill. On the other hand, ZAMACE could then be directly strengthened to establish a WR Unit which can focus on developing an effective WRS.

Establish the Zambian Grain Information Service (ZAGIS)

The policy inconsistencies around grain markets arise from the lack of confidence in information on stock levels in the country. Stock monitoring reports are notoriously imprecise, and a grain information system is missing. Financial and technical support to the stakeholders' initiative to establish an independent body for collection of stock levels and movement modeled around the South African SAGIS is important.

WRS Training and Awareness

Training in warehouse management is critical as this is presently lacking in Zambia, with very few individuals trained, and usually by the private sector for their own operations. Alongside this training, there is a need for a widespread promotion of the WRS to kick-start the entrenchment of a storage industry. This should be done at various levels, including among financial institutions to address the finance challenges.

Cycling of FRA Stocks through ZAMACE

There is evidence discussed earlier that show that FRA has used ZAMACE before and is therefore no stranger to the commodity exchange. The Agency can cycle its SGR through the commodity exchange and get a transparent price and not distort the market. For this to be possible, the FRA Act needs to allow streamlined decision making processes to ensure that the Agency moves with the market. Having a pricing range resolves this as the official who places positions to sell can set this and it can only be known to themselves. This would be a good way for FRA to liquidate its receipts.

Certification of FRA in Commercial Areas

FRA must be re-aligned to support the development of the WRS while still performing its role of maintaining SGRs. The current Act restricts FRA to purchase in rural areas with minimal private sector participation. The storage facilities positioned in commercially viable areas can easily facilitate this initiative. In addition, the FRA Act requires the FRA to collaborate with stakeholders and facilitate agri-business activities such as input finance. In its current operations, the proof of deposit of grain with FRA is only good for accessing FRA payment whenever the Treasury releases funds and the beneficiary cannot monetize it.

This would change with a WR. However, this requires certification of FRA storage in the major production centers, and any SGR requirements can be met through FRA's purchase of WRs for grain under their facilities. This proposal aligns very well with government's proposal to have a commercially viable FRA as per FRA Act amendment proposals. However, some of the proposals in the current state could stifle WRS development and must not be considered, most notably that of the FRA making a profit by purchasing above SGR requirements for sale in the domestic or export market. FRA instead could make such a profit through storage, and handling charges in their certified silos.

WR Finance Guarantee Fund

To create confidence and trust, stakeholders recommended that a guarantee fund (and/or an agricultural fund) that covers some of the perceived risks within WRS (e.g. price) be set up. This should be gradually phased out as a proof-of-concept facilitation. However, this must be run on a best practice basis, reasonable guarantee ratio, ensuring non-politicization and a reasonable cost of participation. Approaching the Zambia Credit Guarantee Scheme for additional collateral cover by third parties could also contribute to increased confidence among financial actors.



Promotion of Community Aggregation

For WRS to function, it is recommended to utilize district farmer associations (DFA) or cooperatives for small-holder farmers. Using some form of aggregator model (localized aggregation at the village/community level) and led by lead farmers as aggregators. Typically, these are used by large grain traders in operating an aggregator model (e.g. by NWK Agriservices). This is important because financial institutions do not want to deal with many small farmers. The emphasis on the aggregator model is to get the lead farmers to show other farmers that the concept works, thus facilitating wider adoption. This concept is not new to Zambia and has been done under the NWK aggregator model, dairy cooperatives, and ZAMACE-GMEP programme. However, capacity strengthening of DFAs and community aggregators is critical. There will be a need to address issues around governance of district cooperatives in pilot sites. There are already interventions around community aggregation and storage by the World Food Programme and private grain traders.

ZABS Standards Harmonisation Support

In order to have national harmonized agricultural standards, there is need for capacity strengthening of ZABSZABS that has in-built best practice procedures for developing standards and stands ready to perform this role with additional financial and material. It is also recommended that ZABSZABS be the reference laboratory for industry players. Laboratories must also be established across the major production centers to speed up dispute resolutions on quality.

Inadequate Business Development Skills in Farmer Groups

The role of farmer groups in the WRS cannot be overemphasized. For effective participation, producer organizations need to work with business organisations. This helps address the business skills challenge currently obtaining. It is also recommended that tailored trainings be conducted for community aggregators and emergent farmers on the value addition that comes with the WRS.



References

- Alemu D., De Groote H., and Bacha D. The Role of Market Information System in Improving Rural Livelihood and the Status of the Service in Ethiopia
<https://repository.cimmyt.org/xmlui/bitstream/handle/10883/2129/89782.pdf?sequence=1&isAllowed=y>
- Andrews, R., Munro, R. and Field, M., 2007. Building a Warehouse Receipts Program that works for all. Notes from the Field No. 1.
- Bank of Zambia, April 2012, Circular No. 5/2012. Lusaka
- Bonaglia, F., 2007. Zambia: Sustaining Agricultural Development, OECD.
- Coulter, J. and Onumah, G., 2002. The role of warehouse receipt systems in enhanced commodity marketing and rural livelihoods in Africa. *Food policy*, 27(4), pp.319-337.
- Braimoh, A., Mwanakasale, A., Chapoto, A., Rubaiza, R., Chisanga, B., Mubanga, N., Samboko, P., Giertz, A. and Obuya, G., 2018. Increasing Agricultural Resilience through Better Risk Management in Zambia. World Bank, Washington D.C.
- Davids, T., Meyer, F. and Westhoff, P., 2017. Impact of Trade Controls on Price Transmission between Southern African Maize Markets. *Agrekon*, 56(3), pp.223-232.
- GRZ (Government of the Republic of Zambia). 2010. The Agricultural Credits Act No. 35 of 2010. Lusaka: National Assembly of Zambia. Retrieved October 4, 2018, from <http://www.parliament.gov.zm/node/3407>
- GRZ (Government of the Republic of Zambia). 2016. The Securities and Exchange Act No. 41 of 2016. Lusaka: National Assembly of Zambia. Retrieved November 8, 2018, from <http://www.parliament.gov.zm/sites/default/files/documents/acts/The%20Securities%20Act,%202016.pdf>
- GRZ (Government of the Republic of Zambia). 2005. Food Reserve Act No. 20 of 2005. Lusaka: National Assembly of Zambia. Retrieved November 8, 2018, from <https://zambialii.org/system/files/legislation/act/2005/20/fra2005142.pdf>
- GRZ, 2016. Moveable Property (Security Interest) Act. Lusaka: Government Printer.
- GRZ, 2014. Statutory Instrument No. 59. Lusaka: Government Printer
- Hernandez, M.A, Rashid, S., Lemma, S. and Kuma, T., 2017. Market Institutions and Price Relationships: The Case of Coffee in the Ethiopian Commodity Exchange, *American Journal of Agricultural Economics*, Vol 99, Issue 3, Oxford University Press.
- IAPRI (Indaba Agricultural Policy Research institute), 2018. A review of the food Reserve Act Cap 225 of the laws of Zambia. Policy Advisory Note. Indaba Agricultural Policy Research institute Accessed December 2018 from http://www.iapri.org.zm/images/PolicyBriefs/FRA_Act_proposed_ammendments_review.pdf
- International Monetary Fund (IMF), October, 2017, IMF Country Report No. 17/328. Washington DC p25
- Lacroix, R. and Varangis, P., 1996. Using warehouse receipts in developing and transition economies. *Finance and Development*, 33, pp.36-39.



- Lusaka Times, 2018. LuSE launches new trading system. Accessed December 2018 from <https://www.lusakatimes.com/2017/12/28/luse-launches-new-trading-system/>
- LuSE, 2015. Request for Proposals for Automated Trading System and Central Securities Depository System. Lusaka.
- Onumah, G., 2010. September. Implementing warehouse receipt systems in Africa potential and challenges. In fourth African agricultural markets program policy symposium, organized by the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA) of the Common Market for Eastern and Southern Africa (COMESA).
- Onumah, G. (2013). Warehouse Receipt Financing in Agriculture in Africa. Retrieved February 20, 2019, from Agricultural Finance Facility: <https://www.agrifinfacility.org/resource/warehouse-receipt-financing-agriculture-africa>
- Saint-Geours, J. E. A. and Shiels, D., 2016. A guide to warehouse receipt financing reform : legislative reform (English). Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/885791474533448759/A-guide-to-warehouse-receipt-financing-reform-legislative-reform>,
- SATIHub, 2015. Recently Upgraded Vetlab Launches New Brand in Lusaka. Accessed December 2018 from at <https://www.satihub.com/food-safety-and-production/211-recently-upgraded-vetlab-launches-new-brand-in-lusaka>
- Silocerts, 2018. About ESC. Accessed January 2019 from <http://www.silocerts.co.za/about.html>
- World Bank, 2012. Using public food grain stocks to enhance food security. Economic and Sector Work. Report Number 71280-GLB. Washington D.C. - The World Bank. <http://documents.worldbank.org/curated/en/2012/09/16687047/using-public-food-grain-stocks-enhance-food-security>.
- ZAMACE, 2008. Profile. Lusaka.
- ZAMACE, 2011. The activities of ZAMACE in Agricultural Warehousing and Warehouse Receipting, An Update Brief prepared for Minister of Agriculture and Cooperatives, Lusaka.
- ZAMACE, 2012. GMEP End of Program Report. Lusaka
- ZAMACE, 2013. Company Profile, Lusaka.
- ZAMACE, 2018. ZAMACE Brief, ZAMACE Limited, Lusaka



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Annexes

A1. Legislative review

WRs in Zambia are directly governed by the Agricultural Credits Act No. 35, 2010, the Movable Property (Security Interests) Act of 2016, and the Securities Act, 2016. Other laws also inevitably interface with the WRS from an operational point of view. For instance, when a commercial bank finances a WR, the Banking and Financial Services Act comes into play. Below, is a brief review of the legislation directly governing the Zambian WRS.

Agricultural Credits Act No. 35, 2010

The Act is in 10 parts. Parts III and IV deal with Agricultural Charges while the rest of the parts deal with the WRS. Part I states that the Act was assented to on 14th November, 2010 and provides as follows:

“An Act to establish the Warehouse Licensing Authority and provide for its functions and powers; facilitate the borrowing of money on the security of charges created on farming stock and other agricultural assets; provide for the registration of charges; provide for the certification of warehouses; provide for the issuance and negotiation of warehouse receipts and the rights conferred by the warehouse receipts; provide for the rights and obligations of warehouse operators; repeal and replace the Agricultural Credits Act, 1995; and provide for matters connected with, or incidental to, the foregoing.”

ZAMACE is an Authorised Agency and appointed in Part I under section 6(1), “The Minister may, by statutory instrument, appoint an authorised agency to perform such functions of the Authority as the Minister may specify.” However, this appointment can be revoked by the Minister as provided in section 6(2), “The Minister may, where an authorised agency fails to comply with the terms and conditions of its appointment, suspend or revoke the appointment of that authorised agency, after giving that authorised agency twenty-one days’ notice to that effect and an opportunity to be heard.”

An Authorised Agency is defined in the Act as, “...any person or institution designated by the Minister to carry out the functions of the Authority.” The Authority is in turn defined as, “...means the Warehouse Licensing Authority established under section three.”

Therefore, ZAMACE’s appointment makes it perform the functions of the Warehouse Licensing Authority which are in section 5(1) as follows:

- a. Certify warehouses
- b. Approve negotiable warehouse receipt books and
- c. Perform any other function incidental or conducive to the carrying out of its functions under this Act or any other law.

In section 5(2) the Authority is given further powers to perform its functions as follows:

- i. Investigate the storage, warehousing, classification, weighing and certification of agricultural commodities
- ii. Inspect any warehouse or cause to be inspected for purposes of certification
- iii. Determine whether warehouses for which certificates are applied or have been issued are suitable for the proper storage of any agricultural commodities
- iv. Classify warehouses according to their ownership, location, surroundings, capacity, conditions and other qualities and according to the type of certificate issued or to be issued
- v. Determine the duties of warehouse operators with respect to their care of and responsibility for the agricultural commodities stored
- vi. Suspend or revoke any certificate for any contravention of or failure to comply with and provision of the Act or condition of the certificate



- vii. Charge, assess and collect fees for the examination or inspection of a warehouse and for the issue of certificates
- viii. Examine the books, records documents and accounts relating to warehouses
- ix. Close a warehouse which is operated contrary to the provisions of the Act
- x. Carry out any other function incidental or conducive to the carrying out of its functions

Part VI gives provisions governing WRs. Of notable mention is section 37, which states that only a warehouse operator authorised under the Act (certified by ZAMACE) can issue a WR. Further, operating as a warehouse operator without certification became an offence that carries a fine upon conviction not exceeding five hundred thousand penalty units or imprisonment for a period not exceeding five years, or both. This provision made it illegal for ZAMACE to develop the WRS before it was appointed as the Authorised Agency, hence the inactivity between 2011 and 2014.

The Agricultural Credits Act, sections 38(1) and 38(2) covers the key instrument at the heart of ZAMACE trading – the WR. Section 38(1), “A warehouse receipt, whether negotiable or non-negotiable, is a document of title.” Whilst, Section 38(2) further states, “Subject to the provisions of this Act, a warehouse receipt issued to a depositor by a warehouse operator in accordance with section thirty seven shall be prima facie evidence of the depositor’s proprietary rights in the agricultural commodities in respect of which the warehouse receipt is issued.”

With a WR, sight-unseen trade can occur and delivery versus payment at settlement is possible in the sense that the ownership of the WR is changed as the payment is moved to the seller (through the selling broker) account. Delivery risk is therefore mitigated.

Securities Act, 2016

The Securities Act was passed in 2016 and repealed the old Act. The Act defines commodities as: “..virtual and non-virtual commodities, such as agricultural commodities, gold, silver, platinum, gemstones, minerals, carbon credits, emission permits, emission allowances, and includes other products commonly known as commodities and which are prescribed by rules made by the Commission.”

A WR is listed in the definitions as an example of a financial security. There is no subsequent mention of commodities or WR in the body of the Act.

Moveable Property (Security Interest) Act, No. 3, 2016

This Act provides for a unified registry in which all types of security interest in movable assets are registered. Before this Act, the registries were fragmented or none-existent, and perpetuated the preference by financial institutions for immovable assets as their registries were assured. This Act supersedes all others and this was done to provide confidence to lenders to accept movable assets as their interests would be secured through the Patents and Companies Registration Agency (PACRA) online-based registry.

Section 3 of the Act defines moveable property as “including goods, intangibles, securities, money, negotiable instruments and negotiable documents.” A negotiable document includes a WR. In the event of financing a WR, the lender would have to indicate the categorisation of the instrument i.e. WR would be a negotiable document (Section 2(2))

This Act under section 11 establishes the Collateral Registry which is operated by the Collateral Registry Office at PACRA. All security interests pledged as collateral are to be kept by the Registry. All submissions to the registry including associated payments are electronic to simplify access.



Other Laws

According to a Legal Expert involved in the drafting of some agricultural sector laws interviewed, the Zambian WRS is likely to be affected by about 17 other Acts. Thus, existing legislation must be aligned to these for coherence. Therefore, further review of the legislative environment by a qualified lawyer needs to be done in order to sort out conflicting legislations that will allow the WRS to operate efficiently in Zambia.



A2 List of interviewed stakeholders and summary of potential commodities

Table A2.1: List of Interviewed Stakeholders

Global Industries Limited	ZDENAKIE Limited	Agri-options Limited	World Bank
Olympic Milling Group Holdings	Musika Development Initiatives Limited	ZAMACE Limited	NWK-Agriservices Limited
United Nations World Food Programme	Ministry of Agriculture (Agribusiness Department; Policy and Planning Department)	Pan African Exchange Limited	Antelope Milling
AFGRl Corporation	Zambia Cooperative Federation	Lusaka Stock Exchange	Chimanga Changa Milling
Emman Food Enterprises	Stock Brokers Limited	Mpongwe Milling	Agrivision Zambia

Source: Authors

Table A2.2: Summary on the potential commodities and support for the WRS

		Production volumes	Probability of market intervention	Comments
Commodities likely to be used	Wheat	Moderate	Low to medium	Produced under tight value chain financing arrangements with a ready offtake market. It is thus unattractive as a potential commodity
	Soya beans	Moderate	Low to medium	Designated as a strategic crop, could be susceptible to disabling policy actions
	Maize	High	High	High potential but highly political crop. It needs market reforms and political will to be a realistic option.
	Mixed beans	Medium-Low (when disaggregated)	Low	Within the beans category, volumes of specific types (e.g. sugar beans) could be very low, it is difficult to disaggregate and would need a value chain study
	White sorghum	Low	Low	
	Millet	Low	Low	
	Rice	Medium (concentrated in some areas)	Low	
	Cashew nuts	Low	Low	Investments in production are still new.
Level of support among potential users of the WRS	Processors	High		
	Commercial farmers	High		
	Smallholder farmers	Not assessed		
	Grain traders	High		
	Financial institutions	Medium to High		
	Warehouse operators	High		
	Food Reserve Agency	Low		
	World Food Programme	High		

Source: Authors

A3. Investment plan

Approximately United States Dollars (US\$) 24.6 million will be required to address the gaps in the Zambian WRS. Table A3.1 below presents a summary of the key activities and cost to enhance the Zambian WRS and the associated costs. The largest cost components include a commodity fund at almost 20 million dollars, followed by ZAMACE's institutional capacity strengthening at almost 2.2 million dollars. The detailed investment plan including the assumptions used to arrive at the proposed costs are presented in the tables in (Annex 4).

Table A3.1: Summary of Cost of interventions to improve the functioning of the WRS

Activity	Cost (US\$)
Review of the existing policies to determine adequacy for operationalisation of WRS	27,000
Review of agricultural marketing legislation to improve decision-making	24,000
Conduct a value-chain and market analysis study for identified potential commodities under the WRS.	155,400
Review of the WRS legal framework	92,000
Review FRA activities in line with the FRA Act of 2005 (i.e. procurement, timing and mode of stock rotation and pricing) in relation to the WRS and the commodity exchange	33,000
Establishment of an inter-ministerial committee to promote the development of WRS	30,000
Strengthen institutional capacity of ZAMACE to enhance warehouse certification	2,232,937
Capacitation of farmer groups to improve governance (i.e. record keeping, member registers, business skills, and registration at the Ministry of Commerce Trade & Industry (MCTI)	360,000
Support ZABS to harmonise grain standards and be the reference laboratory	160,000
Support ZAMACE/LuSE implementation of collaboration MoU	150,000
Establishment of the Zambia Grain Information Service (ZAGIS)	250,000
Improve community level aggregation of commodities	245,000
Certification of FRA storage in commercial areas	536,000
Warehouse receipt system sensitization campaigns	65,000
Establish a credit guarantee scheme/additional collateral by a third party	1,000,000
Establishment of a commodity fund as an innovative financing option given high cost of finance	19,250,000

Source: Authors

The gap analysis on the current status of the Zambian WRS identified three broad categories of issues/gaps hindering the development of the Zambian WRS. These include: **(A) inconsistent policies and legislation; (B) inadequate WRS support infrastructure; and (C) an unenthusiastic financial sector.** The proposed actions aimed at addressing the specific issues under these broad themes are discussed below. The interventions are costed against a timeline for implementation, and potential partners for action identified. The costing and identification of the issues and recommended actions follow from stakeholder consultations and the feasibility study. Stakeholders consulted for this were drawn from the private sector, non-governmental organisations, and cooperating partners (see Annex 2).

At the aggregate level, Table A3.2 shows that the largest cost component relates to WRS financing, which constitutes 82.5% of the total requirements, followed by investments in WRS support infrastructure at 16.6%, and the remainder towards resolving issues around WRS legislation and policies (0.8 %). The rest of the section discusses in detail the proposed investments under each of the four themes.

**Table A3.2:** The Proposed Investments by Issue

Issue	Investment (US\$)	Share in total cost (%)
1. Inconsistent policies and legislation	206,000	0.8
2. Inadequate WRS support infrastructure	4,090,000	16.6
3. Unenthusiastic financial sector	20,315,000	82.5
Total	24,611,000	100.00

Source: Authors Computation based on input from stakeholders

1. Inconsistent policies and legislation

1.1. Policy and legislative review

The feasibility study identified gaps in the legislation governing the Zambian Warehouse Receipts System (WRS). Specifically, there are missing pieces of legislation that could improve the functioning of agricultural markets to the benefit of the agricultural sector and WRS in particular. Most of these remain in draft form, since a review was initiated almost ten years ago. For example, the Agricultural Marketing Bill, and the Commodity Exchange Bill are yet to be enacted. The feasibility study identified gaps in the Securities Act of 2016 which designates a warehouse receipt (WR) as a security, but does not provide any cross-reference to the Act which provides for its creation (i.e. the Agricultural Credits Act of 2010). This limits the treatment of the meaning of the designation to the Securities Act above all other Acts of parliament.

This means that it is illegal to trade a Zambian Commodity Exchange (ZAMACE) issued WR unless ZAMACE is recognised as a licensed exchange by the Securities and Exchange Commission (SEC). However, the Securities Act of 2016 does not provide for the licensing of commodity exchanges in its current form and the draft commodities bill was meant to address this challenge. The failure to enact the draft commodities bill is one reason for this gap. Instead, stakeholders prioritised the Securities Act of 2016, and included some elements of the commodities bill in an incomplete manner. To completely address the legislative gaps and missing legislation, a comprehensive review of all legislation affecting the WRS is necessary, including the marketing of Agricultural Commodities Bill of 2010. A low-cost alternative to this is a ZAMACE/Lusaka Securities Exchange collaboration on the trading side, this transfers issuance of the warehouse receipts to the Lusaka Securities Exchange which is regulated by the Securities and Exchange Commission.

The estimated total cost of a legislative review is **US\$92,000**, assuming a minimum effort of 90 working days by a consulting lawyer, plus a stakeholder consultative meeting. Other costs involve the review of the existing policies to determine its adequacy for operationalisation of the WRS. Table A3.3, summarises the issues, needs, who to deal with the issue, and estimated costs.

1.2. Unintended effects of FRA market participation

The revisions of the Food Reserve Act in 2005 to allow the Food Reserve Agency (FRA) to participate in marketing and trade of designated agricultural commodities has had profound negative impacts on the growth of the grain marketing sector. One of the major problems facing the market and a critical issue that will hinder the development of WRS or commodity exchange has to do with FRA stock disposal to millers as part of its price stabilization strategy and rotation of old stock. When FRA sells at prices which do not reflect carry costs or its efficiency in grain storage, stock rotation is also ill-timed the resultant effect is market price distortions, which are not conducive for the development of the private sector and impedes on the well-functioning of the WRS. To systematically address this concern, stakeholders recommended that an independent review of FRA activities be carried out in relation to the development and operations of the WRS and the commodity exchange. In addition, it was recommended that an Inter-ministerial committee to promote the development of WRS needed to be set up. The estimated total cost if these activities is **US\$63,000**.

Table A3.3: Inconsistent Policies and Legislation: Issues, Needs and Costing

S/N	Issue/challenge	What are the needs or actions to deal with the issue?	How should these actions/needs be accomplished?	Who should deal with these actions/meet these needs?	What would it cost to deal with these needs/actions (US\$)?
1	Inadequacy of the policy environment	Review the existing policies to determine its adequacy for operationalisation of the WRS	Creation of a technical working team.	-IAPRI, Musika and IFAD to develop Terms of Reference -MoA to engage a Consultant to carry out review -Hold consultative meetings	27,000
		Ensure consistent and predictable trade policies	Revisit, revise and enact the Agricultural Marketing Bill	Public: Ministry of Agriculture (MoA), Ministry of Commerce, trade and Industry (MCTI), Ministry of Fisheries and Livestock (MFL), National Assembly Private: Zambia National Farmers Union (ZNFU), National Union for Small Scale Farmers (NUSFAZ), Grain Traders Association of Zambia (GTAZ), Millers Association of Zambia (MAZ), Zambia Association of Manufacturers (ZAM), research Institutions	24,000
2	Missing or inconsistent legislation	-Review and harmonize the Agriculture Credits Act to other legislation including the FRA Act, Standards Act, Securities Act, and Moveable Property Act -Assess the need for a standalone WRS legal framework -Assess the feasibility of amending the Agriculture Credits Act to transfer the functions of the Warehouse Licencing Authority to SEC or the need for self-regulation	-Engage relevant sector ministries and ensure that there is political buy-in across the board -Engage a technical expert (lawyer) to carry out a comprehensive review of relevant WRS legislation	Public: MoA, MFL, MCTI, Ministry of Finance (MoF), ZAMACE LuSE, SEC, ZCSA, IFAD, World Food Programme (WFP), European Union (EU)	92,000
3	Unintended negative impacts of FRA actions on the market	Review FRA activities (procurement, timing and mode of stock rotation and pricing) in relation to the WRS and the commodity exchange	-Engage a consultant to perform an independent review of FRA activities and make recommendations on FRA operational reforms to align with WRS -Lobby and advocate for reforms	Public: MoA, MoF, MCTI, MFL, National Development Planning IAPRI, Consumer Unity and Trust Society (CUTS), ZNFU, NUSFAZ, GTAZ & Centre for Trade Policy and Development (CTPD), National Assembly	33,000
4	Inadequate institutional framework to support successful operationalisation of WRS	Establish inter-ministerial committee to promote the development of the WRS	MoA to coordinate the establishment of the inter-ministerial committee	MoA, MoF, MCTI, MFL, National Development Planning	30,000
Total Cost					206,000

Source: Authors



2. Warehouse Receipts System Support Infrastructure

Table A3.4 summarises the issues, needs, who to deal with the issue, and estimated costs.

2.1 Strengthen ZAMACE's regulatory capacity

The appointment of ZAMACE—a private entity—under Statutory Instrument No. 59 confers on the entity a regulatory role for the implementation of the WRS and its enforcement. As outlined in the feasibility study, whereas the government made the appointment, stakeholder support to ZAMACE was not as forthcoming. The limited trade through the platform exacerbated the problem. Consequently, stakeholder training and awareness was conducted to a very limited extent.

It is recommended that a Warehouse Inspection and Certification Unit be established within ZAMACE. This should be adequately staffed and equipped to ensure that there is the capacity to satisfy the needs of industry while performing the oversight role through periodic inspections and associated services. The cost of support to such a unit over a period of three years is estimated at US\$2,232,937. This covers human capital costs, capital expenditure, and operational costs. It is anticipated that after this period, the certification unit should be self-sustaining. This support will ensure that financial reserves are steadily built up without undue stress over the first three years.

The proposed investment will allow ZAMACE to effectively conduct inspections in Lusaka, Central, Western, and Northern, Eastern, and Southern Provinces. About 3 inspectors will be required for this, the three inspectors will report to an operations official to be based in Lusaka while covering Northern, Eastern and Southern Provinces. The rest of the regions will be covered by the Lusaka office. These officials will identify storage and provide the regional support backed by operations in Lusaka. They will ensure that ZAMACE has presence at all major agricultural events in liaison with the MoA regional officials. Community training and dissemination of WRS information will be channeled through these officials. They will occupy office space typically at partner operations in provincial centers. It is expected that after a period of three years, the role of the regional officers will be performed from Lusaka and they will not be required; and the market would have evolved to the level that support can be provided from the Lusaka office. It is critical that ZAMACE, as the Authorised Agency, be in close or near-close proximity to the community throughout the production regions.

2.2 Grain market information service

The government and stakeholders have played some role in developing a more enabling environment by putting in place legislative frameworks such as the passing of the Agricultural Credits Act of 2010, Statutory Instrument No. 59 of 2014, the Securities Act of 2016, and the Moveable Assets Act of 2016, alongside private sector investments in storage infrastructure and trade. ZAMACE has also established a partnership with the Johannesburg Stock Exchange (JSE) whereby agricultural derivatives can be listed on the JSE to offer price risk hedging on Zambian grain and expose it to the rest of the world. The commodity exchange also signed a memorandum of understanding enabling ZAMACE to collaborate with LuSE in commodities trading.

However, for a warehouse receipt based commodity exchange and the associated derivatives market to evolve, two critical developments need to occur. Firstly, state intervention in the market needs to be reduced and/or become more predictable. Secondly (and related to the first point), transparent and efficient trade, and in particular trade in futures, requires stakeholders to have readily available information and a sound understanding of the fundamentals of an agricultural market - production forecasts, stock levels, exports, imports, and consumption volumes. Information asymmetry allows those players in possession of information a level of advantage in an opaque trading environment, manifesting itself in high margin-taking which is not always beneficial to the counterparties. This often disadvantages the smaller players in the value chain adding to the overall cost of Zambian commodities.

There is a consensus among participants in the grain industry that a reliable market information service that is credible to all parties involved in agricultural trade is required in Zambia to support commercial and policy decision making. Such a service will gather, process, analyse and provide timely distribution of reliable market information to all stakeholders at an affordable fee, which facilitates the sustained provision of the service. This has been tried in the past, and the process stalled because the Central Statistical Office could not write to authorise an agency to collect such information on their behalf, as per provisions under the Census and Statistics Act, Cap 127 of the laws of Zambia. Previously, grain market actors resolved to establish the grain information service as follows:

- Draw inspiration and technical support from the South African Grain Information Service (SAGIS)
- Establish ZAGIS as a totally independent, not for profit company separate from any other interested institution
- ZAGIS is to be owned by GTAZ and MAZ.
- The ZAGIS board of directors should have members from the Government (e.g. MoA and FRA), ZNFU, MAZ, GTAZ, Bankers, and a representative from cooperating partners.
- The management of ZAGIS operations should be independent of the board.
- The government should consider a legislative review or issue subsidiary legislation to give support to the operations of ZAGIS.

The monthly cost of financing ZAGIS operations is estimated at US\$15,000. Of which, stakeholders were willing to support 50 % of this cost if the other 50 % can be sourced from development partners as an investment in launching this initiative for a period of about 24 months. The stakeholder financing is proposed to come from a levy per metric tonne (MT) of grain handled by the industry, initially focused on grains and oilseeds. This requires an investment of US\$250,000 over a period of 24 months.

Table A3.4: Inadequate WRS Support Infrastructure: Issues, Needs and Costing

S/N	Issue/challenge	What are the needs or actions to deal with the issue?	How should these actions/needs be accomplished?	Who should deal with these actions/meet these needs?	What would it costs to deal with these needs/ actions (US\$)?
1	Inadequate Certification Unit	Strengthen institutional capacity of ZAMACE to enhance certification	Financial and material support to ZAMACE	PARM, MUSIKA, WFP, EU, World Bank (WB)	2,232,937
2	Inadequate business development skills in Farmer Groups	Farmer groups need to get organised with proper record keeping and member registers and be registered at MCTI	-Business development training -Empowerment of farmers through tailored training in WRS -Increase awareness on the benefits of WRS	MUSIKA, ZAMACE, ZNFU, NUSFAZ	360,000
3	Unharmonized Quality Standards	Support ZCSA to harmonise grain standards and be the reference laboratory	-ZCSA to be the reference lab for standards testing and dispute resolution -TA to identify need for laboratories in the production centres -Grades and Standards promotion for value-chain actors	ZAMACE, ZCSA, Southern Africa Trade Innovation Hub (SATIHub)	160,000
4	Inadequate ZAMACE commodity trading platform	Support ZAMACE/ LuSE implementation of collaboration MoU	Engage technical consultants to implement MoU	ZAMACE, LuSE, SATIHub, PARM	150,000

(...)



(...) S/N	Issue/challenge	What are the needs or actions to deal with the issue?	How should these actions/needs be accomplished?	Who should deal with these actions/meet these needs?	What would it cost to deal with these needs/actions (US\$)?
5	Lack of comprehensive grain market information	Establishment of the Zambia Grain Information Service (ZAGIS)	-Delegated authority via Central Statistical Office (CSO) as a quick fix -Engage technical consultant to develop the system, install system infrastructure, and train operators. -Develop digital dissemination information platform for market information	MAZ/GTAZ/ZNFU/ SATIHub	250,000
6	Inadequate aggregators	Limited bulking capacity in rural areas	-Invest in community aggregation centers and the capacity of aggregators in three pilot areas (i.e. North Western, Lusaka and Muchinga Provinces) -Survey and geocoding the aggregation centres	ZAMACE/Musika/WFP/ ESAP	245,000
7	Lack of FRA participation in WRS	Certification of FRA storage in commercial areas	Identification of certifiable storage and needs	FRA/ZAMACE/PARM	536,000
	Low non-maize commodity production volumes	Commodities value-chain and market analysis study for WRS potential commodities identified in the feasibility study	Commodities value chain reports and recommendations to increase WRS volume of production	Research Institutes/ PARM	155,400
Total					4,089,337

Source: Authors

2.3 Trading infrastructure and commodities trading

The current state of ZAMACE makes it incapable of effectively providing the market desired services economically. The commodity exchange has signed agreements with two exchanges, LuSE domestically and the JSE regionally. The JSE will offer the futures contracts for Zambian grain as a way to kick-start this segment of the market and provide price-risk hedging opportunities. This also stimulates the WRS in the sense that at maturity for these physically settled contracts, prices of futures and spot tend to merge. There must be physical stock stored under WRS for settlement. The JSE has estimated demand of 100,000MT of storage space for the futures contracts.

The LuSE has in its 2018-2022 strategic plan an intention to expand its business to include commodities and other instruments. In readiness for this, they upgraded their trading infrastructure to position the exchange to be a multi-asset exchange with the Securities Trading technology (STT) trading and clearing system. This is a proven system and has been deployed in Namibia, Kenya, and Tanzania, and is used by the JSE for its commodity derivatives and interfaces with the ESiloCert system for the South African WRS. The same system is deployed at ZAMACE for the WRS.

LuSE is best positioned to operate as a commodity exchange as the infrastructure exists, and is supported by legislation. Further, it conforms to exchange trading best practice in the world in relation to reliability and recovery. There is therefore no need to duplicate these services at ZAMACE. The recommendation to support the collaboration between ZAMACE and LuSE and through this with the JSE is premised on the fact that the JSE has a revenue share and collaboration agreement with ZAMACE, and that LuSE and ZAMACE

have a collaboration MoU. Further, the LuSE is a member of the Committee of SADC Stock Exchanges (COSSE); which has a MoU with all SADC exchanges to provide each other technical assistance and cooperation in the development of the SADC markets and as part of this initiative, the LuSE Listings Rules are benchmarked to the JSE. Therefore, the support to ensure that processes and activities to get the ZAMACE Trading Platform to be operated from the LuSE is a natural fit.

The consultancy around the identification and coordination of these services which include liaison with STT, the providers of the LuSE trading system, change-requests, and user trading system testing, are estimated at US\$150,000. This will allow for the LuSE and ZAMACE to conclude the system requirements and facilitate the availability of STT technicians on sight, as well as for training and interface among the exchanges

2.4. Standards harmonisation and awareness

There are two commodity quality standards in use in the country; ZAMACE standards and the national standards under the Zambia Bureau of Standards (ZABS). The two are not harmonised and also differ with other regional standards such as those in the East African Community which is a potential market for Zambia. Standards harmonisation and country-wide communication thus form the investment categories under this theme. The need for harmonization of in-country standards is in view of the fact that regional standards harmonization will only be done for national standards, moreover, it is proposed that ZABS be the reference laboratory for the industry. The modalities of ensuring this is efficient can be worked out later, for example, ZABS can appoint accredited agents to perform this function should capacity be an issue.

ZABS best practice process requires that this process of harmonization and revision of product standards is undertaken through the Technical Committees on Cereal and Cereal Products, and Legumes, Pulses and Derived Products. There are several stages which are required to be followed and this will be over a period of up to six months; proposal stage, preparation of working drafts, committee review, public inquiry, approval stage, publication of the standards, and the production of brochures for dissemination. This is expected to cost US\$160,000.

2.5. Localised aggregation

ZAMACE has in the past trialed a community-based aggregation model which aims at making the household as an intervention point to establish adherence to the quality standard and reduce post-harvest losses. Community storage identification and enhancement through farmer groups and networks of aggregators satisfy other stakeholder participants' requirements for consolidation such as was observed in the case of processors and traders who do not like dealing with fragmented producers. Financiers seek economies of scale to make the whole intervention worth their while and to reduce costs.

The model of community-based aggregation also ensures more efficient smallholder aggregation considering that most of the agricultural activity is smallholder based. This approach requires concerted efforts and collaboration with other stakeholders on the ground such as the WFP, International Development Enterprises (iDE) and Musika Development Initiatives who have been working with farmers to enhance household level storage for larger certified storage at community and district level. The cost of intervention is estimated at US\$605,000 over a period of 36 months. This covers; identification of community storage, training of trainers and farmer groups, enhancing farmer group governance, provision of basic quality testing equipment such as moisture meters, scales and training material on grain storage and handling, as well as potentially minor rehabilitation of storage infrastructure.

Community-based promotion of the WRS through community radio stations, local agricultural shows and field events and the publication of promotional material in the seven major local languages and its dissemination is also provided for. This will not be done in isolation but in collaboration with what other partners have been doing in encouraging community aggregation. The aim of this intervention is to sustainably link these activities to the WRS.



2.6. Food Reserve Agency alignment to the warehouse receipt system

The feasibility study established that the FRA is not a complete stranger to the WRS and ZAMACE trading platform. The Agency has traded almost 18,000MT on the commodity exchange and has used the services of ZAMACE's predecessor organisation, the Zambia Commodity Agency for quality testing of its purchased grains. The current model of purchases employed by the FRA subjects the farmer to deliver the commodity to its satellite depots and await payment, which takes over four months in some cases. The documents which the FRA gives to the farmer cannot be used to access finance in the interim. The farmer is thus subjected to a period of waiting for payment until the treasury funds the FRA to pay them off. This does not take into consideration the time value of money and more importantly, it delays farm-level investments. It also distorts the maize market as the private sector sets their buying prices slightly above the FRA price.

The recommendation for the FRA to identify its storage in commercial areas for certification under the WRS could create confidence in the industry, given that it is one of the largest players in the maize market. The certified storage also allows the FRA to create an income stream from storage and associated WRS charges. To enable this, about US\$536,000 will be needed. This will cover short-term consultancy expenses aimed at assisting the FRA to identify suitable storage in commercial areas to be certified, including the cost of preparatory works on some of the identified sites and assignment of staffing within the FRA to operate the certified storage unit. We envisage that 20% of the current strategic grain reserves requirement can be dedicated to this trial potentially giving the FRA a gross revenue stream of US\$250,000/month at an all-in storage rate of US\$2.5/MT/month.

3. Unenthusiastic Financial Sector

The feasibility study has identified that one of the challenges to the WRS in Zambia is the high cost of finance and government's crowding out of private sector borrowing through domestic borrowing. As a result of the high premiums for treasury bills and government bonds, the financial sector is not innovating and lending to agriculture and in this case the WRS is most likely to be adversely affected. The solution to this challenge is to establish, first a commodity fund from institutional investors, these are already interested in commodity financing, secondly, and there is a need to provide levels of guarantee for the WRS to stimulate demand for its use. To attract financial institutions to provide financing against warehouse receipts, we recommend the provision of a premium-based Credit Guarantee that is run with international best practices in mind. The current certified space is at 301,000MT and at an average price of US\$170/MT suggests a tradeable value of US\$51,170,000. Assuming that only 20% of this is receipted and that only 75% requires financing at a 20% discount US\$6,100,000 will require financing. Given a 50% Credit Guarantee, it is proposed that US\$1,000,000 be invested in the provision of a premium based guarantee. Further, we have proposed an amount of US\$ 19,250,000 which can be accessed on a revolving fund basis to finance WRS activity such as trading.

There is an urgent need to develop a standardised document on the WRS processes which the financial sector can use for internal domestication in their risk-assessment and lending. This will aid in the mitigation of perceptions around the WRS and associated risk. Therefore, a total amount of **US\$20,315,000** over a period of three years for this aspect is proposed. Table A3.5, summarises the issues, needs, who to deal with the issue, and estimated costs.

Table A3.5: Unenthusiastic Financial Sector: Issues, Needs and Costing

S/N	Issue/challenge	What are the needs or actions to deal with the issue?	How should these actions/needs be accomplished?	Who should deal with these actions/meet these needs?	What would it cost to deal with these needs/actions (US\$)?
1	Inadequate awareness and skills.	-Sensitization and Training -Strategic partnerships with other organisations working in rural areas -Public awareness campaigns and campaign material production	Development of a WR Handbook for financial institutions	ZAMACE, Bankers Association of Zambia, Capital Markets Association. PACRA	65,000
2	Lack of trust in the warehouse receipt due to perceived high risks	Establish a credit guarantee scheme/ additional collateral by a third party	Approach the Zambia Credit Guarantee Scheme	Zambia Credit Guarantee Scheme Limited (MoF), MIGA (World Bank), USAID	1,000,000
3	High cost of finance	Lack of long term financing on the Zambian market	Approach institutional investors within the country to finance a Commodity Fund	ZAMACE Limited, Bankers Association of Zambia, Pensions and Insurance Authority, CMAZ, Platform for Agricultural Risk Management, Alliance for Green Revolution in Africa	19,250,000
Total					20,315,000



A4. Assumptions used to arrive at the costs outlined in the proposed investment plan

Table A4.1: Summary

Theme	Investment	Share(%)
Inconsistent Policy	206.000	0,8
Unsupportive WRS Infrastructure	4.090.000	16,6
Unenthusiastic Financial Sector	20.315.000	82,5
TOTAL INVESTMENT	24.611.000	100,0

Table A4.2: Logical Framework

Issue Theme	Sub Issues	Actions	Deliverables	Collaborators	Y1	Y2	Y3	Y4	Y5	SubTotal	Total
Inconsistent Policy	Inadequacy of the policy environment	Review of the existing policies to determine their adequacy for operationalisation of the WRS	Creation of a Technical Working Team Engagement of a Consultant to conduct review	IAPRI, Musika	12,000					27,000	
			Hold consultative meetings to get feedback on policy review	Ministry of Agriculture (MoA)	15,000						
			Revisit, revise and enact the Agricultural Marketing Bill, 2010	Public: Ministry of Agriculture (MoA), Ministry of Commerce, trade and Industry (MCTI), Ministry of Fisheries and Livestock (MFL), National Assembly							
		Ensure consistent and predictable trade policies		Private: Zambia National Farmers Union (ZNFU), National Union for Small Scale Farmers (NUSFAZ), Grain Traders Association of Zambia (GTAZ), Millers Association of Zambia (MAZ), Zambia Association of Manufacturers (ZAM), research Institutions	24,000					24,000	206,000 (..)
	Missing / Inconsistent Legislation	<ul style="list-style-type: none"> Review and harmonize the Agriculture Credits Act to other legislation including the FRA Act, Standards Act, Securities Act, and Moveable Property Act Assess the need for a standalone WRS legal framework Assess the feasibility of amending the Agriculture Credits Act to transfer the functions of the Warehouse Licencing Authority to SEC or the need for self-regulation Review and harmonize the Agriculture Credits Act to other legislation including the FRA Act, Standards Act, Securities Act, and Moveable Property Act Assess the need for a standalone WRS legal framework Assess the feasibility of amending the Agriculture Credits Act to transfer the functions of the Warehouse Licencing Authority to SEC or the need for self-regulation 	Engage relevant sector ministries and ensure that there is political buy-in across the board	Public: MoA, MFL, MCTI, Ministry of Finance (MoF), ZAMACE LuSE, SEC, ZABS, IFAD, World Food Programme (WFP), European Union (EU)	92,000					92,000	



(-)	Issue Theme	Sub Issues	Actions	Deliverables	Collaborators	Y1	Y2	Y3	Y4	Y5	SubTotal	Total
	Inconsistent Policy	Unintended negative impacts of FRA actions on the market	Review FRA activities in line with its mandate and the FRA Act of 2005 (procurement, timing and mode of stock rotation and pricing) in relation to the WRS and the commodity exchange	<ul style="list-style-type: none"> Engage a consultant to perform an independent review of FRA activities and make recommendations on FRA operational reforms to align with WRS Lobby and advocate for FRA reforms 	Public: MoA, MoF, MCTI, MFL, National Development Planning IAPRI, Consumer Unity and Trust Society (CUTS), ZNFU, NUSFAZ, GIAZ & Centre for Trade Policy and Development (CTPD), National Assembly	33,000					33,000	
		Inadequate institutional framework to support successful operationalisation of WRS	Establish inter-ministerial committee to promote the development of WRS	Establishment of an inter-ministerial Committee coordinated by MoA	MoA, MoF, MCTI, MFL, National Development Planning	30,000						30,000

(...) Issue Theme	Sub Issues	Actions	Deliverables	Collaborators	Y1	Y2	Y3	Y4	Y5	SubTotal	Total	
Unsupportive WRS Infrastructure	Inadequate Certification Unit	ZAMACE Certification Unit CAPEX ZAMACE Certification Unit Operational Support for 3 years	Financial and technical support to ZAMACE	ZAMACE, LuSE, Platform for Agriculture Risk Management (PARM), Musika, WFP, European Union (EU), World Bank (WB)	232,073	612,392	665,367	723,105		2,232,937		
	VVC	Farmer groups need to get organised with proper record keeping and member registers and be registered at MCCT	<ul style="list-style-type: none"> Business development training Empowerment of farmers through tailored training in WRS Increase awareness on the benefits of WRS 	MUSIKA, ZAMACE, ZNFU, NUSFAZ	120,000	120,000	120,000			360,000		
	Unharmonized Quality Standards	Support ZABS to harmonise grain standards and be the reference laboratory	Revision and development of quality standards for ZABS to be ref lab TA to identify need for laboratories in the production centres Grades and Standards promotion for value-chain actors on community radio	ZAMACE, ZABS, Southern Africa Trade Investment Hub (SATIHUB), WFP	50,000	10,000	10,000	21,500	21,500	160,000		
	Inadequate ZAMACE commodity trading platform	Support ZAMACE/ LuSE implementation of collaboration MoU	Engage technical consultants to implement MoU	ZAMACE, LuSE, SATIHUB, PARM	150,000					150,000		
	Lack of comprehensive grain market information	Establishment of the Zambia Grain Information Service (ZAGIS)	Engage Consultant to coordinate incorporation and associated services and CSO delegated authority Liaison with SAGIS to configure, install system infrastructure, and train operators. Launch event, operational costs, Capex	MAZ/GTAZ/ZNFU/SATIHUB	18,000	100,000				250,000		
	Inadequate aggregators	Limited bulking capacity in rural areas	Identify and support development of community bulking centres for beans in 3 pilot areas in NWWestern, Muchinga and Lusaka regions Capacity building of communities	ZAMACE/Musika/WFP/ESAP	107,250	11,000	11,000	2,750		245,000		
	Low non-maize commodity production volumes	Commodities value-chain and market analysis study	Commodities value chain reports and recommendations to increase WRS volume of production	PARM, IAPRI, Musika, MoA	155,400					155,400		
	Lack of FRA participation in WRS	Certification of FRA storage in commercial areas	Identification of certifiable storage and needs	FRA/ZAMACE/PARM	536,000					536,000		
												4,089,337 (...)



(...) Issue Theme	Sub Issues	Actions	Deliverables	Collaborators	Y1	Y2	Y3	Y4	Y5	SubTotal	Total
Unenthusiastic Financial Sector	Inadequate awareness and skills.	Sensitization and Training			40,000						
		Public awareness campaigns and campaign material production	Development of a WR Handbook for financial institutions	ZAMACE, Bankers Association of Zambia (BAZ), Capital Markets Associatio (CMAZ), Patents and Company Registration Agency (PACRA)							65,000
	Strategic partnerships with other organisations working in rural areas			25,000							
	Lack of trust in the warehouse receipt due to perceived high risks	Establish a credit guarantee scheme/additional collateral by a third party	Approach the Zambia Credit Guarantee Scheme	Zambia Credit Guarantee Scheme Limited (MoF), MIGA (World Bank), USAID	1,000,000					1,000,000	20,315,000
	High cost of finance	Lack of innovative reasonably priced long term financing on the Zambian market	Approach and secure institutional funds and establish two Commodity Funds	Pensions and Insurance Authority (PIA), National Pension Scheme Authority (NAPSA), CMAZ, Platform for Agricultural Risk Management (PARM), Alliance for Green Revolution in Africa (AGRA), Southern Africa Trade and Investment Hub (SATHub), ZAMACE, BAZ	11,000,000	5,500,000	2,750,000			19,250,000	

Table A4.5: WRS Certification Unit

WRS CERTIFICATION UNIT	YEAR 1												YEAR 2			YEAR 3			YEAR 4		
	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12	TOTAL								
WO Certification Fees	-	-	625	-	-	625	-	-	625	-	-	625	2,500	3,750	5,000	6,250					
WO Site Fees	-	-	625	-	-	625	-	-	625	-	-	625	2,500	3,000	3,500	4,000					
WR Issue Fees	-	-	17,292	-	-	17,292	-	-	17,292	-	-	17,292	69,167	103,750	138,333	172,917					
WR Transfer Fees	-	-	1,250	-	-	1,250	-	-	1,250	-	-	1,250	5,000	7,500	10,000	12,500					
WR Financial Institution Pledge Fees	-	-	2,344	-	-	2,344	-	-	2,344	-	-	2,344	9,375	14,063	18,750	23,438					
Trading Income	-	-	17,500	-	-	17,500	-	-	17,500	-	-	17,500	70,000	89,542	109,000	128,083					
Grant Financing - Silo Cert System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Grant Financing - CAPEX	232,073	-	-	-	-	-	-	-	-	-	-	-	232,073	-	-	-					
DFI Grant	58,783	40,073	83,837	39,573	40,073	40,073	56,064	40,073	67,346	39,573	39,573	67,346	612,392	665,367	723,105	280,396					
TOTAL INCOME	290,856	40,073	123,473	39,573	40,073	79,709	56,064	40,073	106,982	39,573	39,573	106,982	1,003,006	886,971	1,007,689	627,584					
Salariés																					
Manager	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	72,000	79,200	87,120	95,832					
Accountant	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	48,000	52,800	58,080	63,888					
Operations/Business Dev. Manager	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	42,000	46,200	50,820	55,902					
Inspector	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000	19,800	21,780	23,958					
Regional Inspector	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000	19,800	21,780	-					
Regional Inspector	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	18,000	19,800	21,780	-					
ESC Operator	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	12,000	13,200	14,520	15,972					
Staff Gratuities	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	4,750	57,000	62,700	68,970	75,867					
Total Salaries	23,750	23,750	23,750	23,750	23,750	23,750	23,750	23,750	23,750	23,750	23,750	23,750	285,000	313,500	344,850	331,419					



(...) WRS CERTIFICATION UNIT	YEAR 1												YEAR 2		
	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12	TOTAL	TOTAL	
Other Direct Costs															
Rent and Utilities	6.700	6.700	6.700	6.700	6.700	6.700	6.700	6.700	6.700	6.700	6.700	6.700	6.700	80.400	88.440
Rent and Utilities - Regions	2.600	2.600	2.600	2.600	2.600	2.600	2.600	2.600	2.600	2.600	2.600	2.600	2.600	31.200	34.320
Vehicle Running Costs	3.021	3.021	3.021	3.021	3.021	3.021	3.021	3.021	3.021	3.021	3.021	3.021	3.021	36.250	39.875
Insurance	10.150	-	-	-	-	-	-	-	-	-	-	-	-	10.150	11.165
Internet, Web Service and Communication	845	845	845	845	845	845	845	845	845	845	845	845	845	10.145	11.160
SiloCert Setup Cost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment Maintenance	157	157	157	157	157	157	157	157	157	157	157	157	157	1.886	2.075
Subsistence for field visits	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	2.400	28.800	31.680
Certification Committee Meetings	-	500	500	500	500	500	500	500	500	-	-	500	500	3.500	3.850
Bank Charges	100	100	100	100	100	100	100	100	100	100	100	100	100	1.200	1.320
Total Direct Costs	25.973	16.323	16.323	15.823	16.323	16.323	16.323	16.323	16.323	15.823	15.823	16.323	16.323	203.532	223.885
Training and Marketing															
Training of SiloCert Operator	5.000	-	-	-	-	-	-	-	-	-	-	-	-	5.000	5.000
Launch Event	4.060	-	-	-	-	-	-	-	-	-	-	-	-	4.060	-
Publications	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marketing and Advertising	-	-	27.273	-	-	-	-	27.273	-	-	-	27.273	-	81.818	90.000
WO Conferences	-	-	16.491	-	-	-	16.491	-	-	-	-	-	-	32.982	32.981,82
Total Training and Marketing	9.060	-	43.764	-	-	-	16.491	-	27.273	-	-	27.273	123.860	127.982	

(..) WRS CERTIFICATION UNIT													
USD	YEAR 1			YEAR 2			YEAR 3			YEAR 4			
	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12	TOTAL
Capital Expenditure													
Motor Vehicle Purchases	220.000	-	-	-	-	-	-	-	-	-	-	-	220.000
Computers, Printers & Office Equipment	7.545	-	-	-	-	-	-	-	-	-	-	-	7.545
Furniture - Manager's Office	1.364	-	-	-	-	-	-	-	-	-	-	-	1.364
Furniture - Coordinators' Offices	2.036	-	-	-	-	-	-	-	-	-	-	-	2.036
Furniture - SiloCert Operator's Office	1.128	-	-	-	-	-	-	-	-	-	-	-	1.128
Total Capital Expenditure	232.073	-	-	-	-	-	-	-	-	-	-	-	232.073
TOTAL EXPENDITURE	290.856	40.073	83.837	39.573	40.073	40.073	56.064	40.073	67.346	39.573	39.573	67.346	844.465
Opening Balance	-	-	-	39.635	39.635	39.635	79.271	79.271	79.271	118.906	118.906	118.906	158.542
NET Surplus/(Deficit) for Month/ YEAR	-	-	39.635	-	-	39.635	-	-	39.635	-	-	39.635	221.604
Closing Balance	-	-	39.635	39.635	39.635	79.271	79.271	79.271	118.906	118.906	118.906	158.542	380.146
													664.729
													723.105
													664.729
													731.520

**Table A4.6:** ZAMACE Revenue

ZMW/USD	12
ZMW/ZAR	0,85

Commodity	2016	2017	2018	Average	10%
Maize	2.873.052	3.606.549	2.300.000	2.926.534	292.653,37
Wheat	221.645	193.713	114.462	176.607	17.660,67
Soya beans	267.490	351.416	302.000	306.969	30.696,87
				3.410.109	341.011
Sunflower	59442	50220	47.594	52.419	
Groundnuts		168699	181.772	175.236	
Mixed beans		45938	52.351	49.145	

Revenue opportunities		RATE	ASSUMPTION	Y1	Y2	Y3	Y4	Y5
A	WRS Service							
1	WO License	5.000,00	6	30.000	45.000	60.000	75.000	90.000
2	WO Sites	2.000,00	15	30.000	36.000	42.000	48.000	54.000
3	WR Issue	8,30	100.000	830.000	1.245.000	1.660.000	2.075.000	1.660.000
4	WR Transfer	3,00	20.000	60.000	90.000	120.000	150.000	120.000
5	WR Pledge	1,50	75.000	112.500	168.750	225.000	281.250	225.000
			Total ZMW	1.062.500	1.584.750	2.107.000	2.629.250	2.149.000
			Total USD	88.541,67	132.062,50	175.583,33	219.104,17	179.083,33
			Total USD REV	158.542	221.604	284.583	347.188	308.750

**RevGrowth from initial**

WO License	150%	200%	250%	300%
WO Sites	120%	140%	160%	180%
WR Issue	150%	200%	250%	200%
WR Transfer	150%	200%	250%	200%
WR Pledge	150%	200%	250%	200%
Trade Commission	150%	200%	250%	200%
JSE Share	120%	140%	160%	180%
Corporate Broker	120%	150%	150%	150%
Farmer Group Broker	125%	125%	125%	125%
SGR Rotation	150%	200%	250%	250%

- I. * the revenue projections have considered at conservative view with 4 registered operators versus a less conservative approach with a total of 9 operators and 300 000 tons registered storage in year 2 onwards
- II. the revenue model considers the registered storage that could initially form part of the commodities exchange business
- III. all revenue is presented in Kwacha and excluding VAT where applicable
- IV. the "metric" column aims to describe the basis for the charge, either per ton, or registered site etc
- V. JSE revenue takes a conservative approach by basing its initial number of tonnages considering only 3% of total production on maize, wheat and soya is traded, the more riskier works off 10% of production

2016	2017	2 year average prod in ton
2.873.052	3.606.549	3.239.801
221.645	193.713	207.679
267.490	351.416	309.453
		3.756.933

- VI. there is a 8% cost escalation for all expenses year on year out to 5 year assumptions
- VII. exchange rates conversion applied ZAR/ZMW is 0.85 and USD/ZMW is 11.78
- VIII. there is a 8% cost escalation for all expenses year on year out to 5 year assumptions
- IX. Pricing in Kwacha excluding VAT, except where USD is clearly stated

**Table A4.7: ZABS**

Committee Discussion	No. Days	Qty	Rate	Total	USD
Conference package	5	20	400	40.000	3.333
DSA - Technical Committee Members	6	20	1000	120.000	10.000
Transport refund	2	20	500	20.000	1.667
Stationery (Reams of paper)	1	5	100	500	42
Toner	1	1	2500	2.500	208
TOTAL				183.000	15.250

Review of Public Comments	No. Days	Qty	Rate	Total	USD
Conference package	5	20	400	40.000	3.333
DSA - Technical Committee Members	5	20	1000	100.000	8.333
Transport refund	2	20	500	20.000	1.667
Stationery (Reams of paper)	1	5	100	500	42
Toner	1	1	2500	2.500	208
TOTAL				163.000	13.583

Printing promotional materials	Qty	Rate	Total	USD
Brochure/booklet graphic design			26.496	2.208
Brochures	3500	15	52.500	4.375
Booklets	3500	50	175.000	14.583
TOTAL			227.500	21.166

Promotional Activities:	Unit	Qty	Cost	Total USD
Community Radio Programmes	Quarterly	18	500	9.000
Printing brochures (English and 7 local languages)	annual	12.000	5,50	66.000
Training of Trainers - Grain handling	bi-annual	10	1.500	15.000
				90.000

**Table A4.8:** FRA

Item	Days	Rate	No	Total
Consultancy	60	600	1	36.000
Rehabilitation, etc estimate				500.000
				536.000

Table A4.9: LuSE

Item	Days	Rate	No	USD
Consultancy	50	800	1	40.000
Air Fare	1	650	4	2.600
Accomodation	5	150	4	3.000
System Change Fees	1	100000	1	100.000
Launch event	1	4400	1	4.400
				150.000



Table A4.10: Proposed Zagis implementation budget

Item Detail	Amount USD	Yr1/month												Total		
		1	2	3	4	5	6	7	8	9	10	11	12			
Stationary/Printing	150															
Internet/Communication	100															
Logistics	150															
One Day Forum Venue/Meals/Breaks	1,000															
Rappotuer Cost	150															
Consultant (Coordination/Forum Report Prep) - 7 days	4,200															
ZAGIS Implementation Plan Consultancy - 30 days	18,000		18,000												18,000	
Liaison with MoJ/MAL on Legislative Framework & draft	700		700												700	
Engagement of Legal Counsel/ZAGIS registration/secretarial	1,500		1,500												1,500	
ZAGIS Logo/branding design	300			300											300	
ZAGIS ICT Infrastructure	100,000				100,000										100,000	
Internet/Communication (36 months)	6,000						500								500	6,000
Office Premises say 50m2 (36 months cost)	27,000						2,250								2,250	27,000
Office (Firmnt/furniture/equipment)	13,500										13,500					13,500
Double Cab 4x4 Purchase & 12 month Expenses	78,000														78,000	
ZAGIS Launch Event	5,000														5,000	
Cost			20,200	300	-	100,000	91,500	7,750	-	-	2,750	225,250	11,000	11,000	2,750	250,000

PRE/STAKEHOLDER CONSULTATIVE FORUM



Table A4.11: Finance

Actions	Deliverables	UoM	Unit	Rate	Yr1	Yr2	Yr3	Yr4	Yr5	SubTotal	Total
Sensitization and Training Public awareness campaigns and campaign material production	Consultancy to develop handbook for financial institutions	Days	50	800	400,000					40,000	65,000
Strategic partnerships with other organisations working in rural areas	Financial institution training and material	No.	1	25,000	25,000					25,000	
Establish a credit guarantee scheme/ additional collateral by a third party	Approach the Zambia Credit Guarantee Scheme	No.	1	1,000,000	1,000,000					1,000,000	1,000,000
Lack of long term financing on the Zambian market	Secure institutional investors within the country to finance a Commodity Fund	No.	1	11,000,000	11,000,000	5,500,000	2,750,000			19,250,000	19,250,000
				Yr1	11,000,000						20,315,000
		NPL		2%	220,000						
		Interest		5%	550,000						
		Fund Cost		1%	110,000						
					880,000						
				Yr2	10,120,000						
				Yr2 add	5,500,000						
					15,620,000						
		Costs			880,000						
				Yr3	14,740,000						
				Yr4	17,490,000						

**Table A4.12:** CG&F

Item	Amount USD	Comments
Traded MT	301.000	Based on certified storage
Under WRS	100%	Certified storage is filled
Under WRS MT	301.000	
Price	170	Assumed maize price (could be higher for other commodities)
Value	51.170.000	
Financed	75%	Assumed financed proportion
Financed Value	38.377.500	
Discount Factor	20%	Assumed applied discount factor
Actual Value	30.702.000	Actual financed value
CGF	50%	Assumed Partial Guarantee of 50%
CGF Exposure	15.351.000	Guaranteed Value
Premium	7%	Assumed premium for Guarantee
Actual cover outlay	997.815	Value of Guarantee cover
CGF	1.000.000	CGF Requirement rounded off
Commodity Fund	11.000.000	Indicative commodity trade financing at % of trade value
Proposed	12.000.000	

Note This loan amount is provided to non-bank fund managers so that they extend financing to traders, WR financing, etc to catalyse fin-sector interest

	Price	MT	No. Mills	Months	Comment
Maize	170	48.529	5	3	Consumption of mid-size mills of 150MT/day
Soy	405	6.790	3	1	Consumption of mid-size crushers of 100MT/day

Indicative view of what proposed Fund size would buy if split 75/25 to Maize and Soya at the indicated prices

The sum proposed for the kickstarting the Commodity Fund is not a huge sum when viewed from the commodity it can buy in terms of consumption demand by processors



PARM
PLATFORM FOR
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