FINAL REPORT

Challenges and Opportunities for Implementation of Warehouse Receipt Systems in Smallholder Agriculture

The case of cereals and pulses in Tanzania

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AGRICULTURAL COUNCIL OF TANZANIA

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1. INTRODUCTION

1.1 Background

This report constitutes one of the key deliverables of the consultancy assignment commissioned by the Agricultural Council of Tanzania/Tanzania Agricultural Partnership (ACT/TAP)[1] under the "Advocacy on Warehouse Receipts System (WRS): A Challenge or Opportunity to Tanzanian Smallholder Farmers" project. ACT works as a coordinator of the TAP programme which uses the Value Chain Approach (VCA) to vigorously promote private sector development in agriculture. The programme has empowered farmers in 29 districts of Mainland Tanzania and strengthened business linkages between different value chain actors. ACT/TAP is currently executing its phase II programme which aims to contribute to the improvement of food security and poverty reduction in rural areas through commercially oriented activities and investments.

To achieve the overall goal of ACT/TAP National Rollout Programme and its purpose of accelerating agricultural growth in the programme areas, five strategic objectives are addressed, namely: i) increased agricultural productivity and profitability; ii) improved smallholder farmers access to market; iii) increased financing and investment in agriculture; iv) increased advocacy and networking; and v) mainstreaming cross-cutting issues.

Closely linked to these strategic objectives is the implementation of the Warehouse Receipt System (WRS)[2] which entails the provision of a Warehouse Receipt (WR) as a document guaranteeing the existence and availability of a given quantity and quality of a commodity in storage for safekeeping; often used in cash and futures transactions instead of having to deliver the physical goods or commodities.[3] The lack of efficient storage infrastructure is a major reason for the very high levels of postharvest losses in Africa. The World Bank study in Eastern and Southern Africa on the cost of postharvest losses in the grain sector showed that it is in the

[1] ACT is an agricultural private sector apex organization in Tanzania which was established in 1999 as the Tanzania Chamber of Agriculture and Livestock (TCAL) and officially launched in 2000. The council is registered as a company limited by guarantee and having no capital. In 2005, the organization changed its name to Agricultural Council of Tanzania to reflect its democratic nature and to act as a forum for free dialogue between actors.

[2] TWLB (2013) defines WRS as "denotes a kind of trade by which commodities are stored in a Licensed Warehouse(s), the owner of the commodity receives Warehouse Receipts which certifying the title of deposited commodities as of specific ownership, value, type, quantity and quality (grades)." The depositor may be a producer, farmer group, trader, exporter, processor or indeed any individual or body corporate. The warehouse operator holds the stored commodity by way of safe custody; implying he/she is legally liable to make good any value lost through theft or damage by fire and other catastrophes but has no legal or beneficial interest in it. The receipts may be transferable, allowing transfer to a new holder a lender (where the stored commodity is pledged as security for a loan) or trade counter-party which entitles the holder to take delivery of the commodity upon presentation of the warehouse receipt at the warehouse (Onumah, 2010; 2003).

[3] www.investorwords.com/ warehouse receipt/21/January/2013

region of 13.5% of total output which is quite significant (World Bank, 2011).[4] The WRS is therefore an arrangement that solves this problem (lack of storage facilities) and the difficulty of obtaining credit. It reduces postharvest losses, addresses inefficiencies in agricultural markets, opens up access to remunerative markets and reduces cheating, and helps to manage food security. It is a sustainable mechanism for increasing agricultural production, availability of good quality commodities and access to financial services with overall result being improved marketing of agricultural commodities (*ibid*).

1.2 Research Agenda

The research agenda is hinged on the overall existence of malfunctioning elements of the WRS in Tanzania despite its numerous potential to benefit smallholder farmers in the country. The idea was to conduct a study to identify existing weaknesses and opportunities for reforms understanding that a well-designed WRS can provide various benefits for all parties involved and that the extent of these benefits varies from one place or country to another depending on the existing conditions (FAO, 2015).

Several benefits are listed in the literature. These include the access to credit for smallholder farmers and other agricultural producers while enabling them to strategically delay the sale of agricultural products till after the harvest season; enhanced participation of smallholder farmers in the commodity market by allowing them to consolidate their crops in a warehouse and sell them jointly; reduced postharvest losses for smallholder farmers who use the system's warehouses that have mandatory storage and handling standards; reduced risks for creditors who lend to farmers and other agricultural producers through secure collateral; mobilized credit for the overall agricultural sector; improved quality of agricultural commodities by determining the mandatory quality standards for those commodities; enhanced agricultural trade through facilitated market transactions and, if warehouses are linked to a commodity exchange, improved exchange trading; moderated high-season price fluctuations when agricultural commodities are stored until after the harvest season; information provided to government authorities about agricultural commodities stored in the country that can aid in forecasting food shortages (IFAD, 2016; FAO, 2015; Onumah, 2010).

Unfortunately, many producer groups - especially the smallholder farmers, as well as, small and medium traders are usually unable to enjoy these benefits particularly in an environment where formal contracts enforcement mechanisms lack and the ability to develop trust based on repeated transactions or informal relationship or access to market institutions which facilitate trade-by-description constitutes a significant entry barrier to markets. A well designed WRS offers a means to overcome this barrier by enabling farmers to bulk their crop for deposit, while ensuring compliance with quality standards and minimum quantity requirements. It also facilitates price stability and guarantees farmers with the loans from banks using the stored crop as collateral until it is sold.

[4] See also: https://www.pressreader.com/zimbabwe/the-herald-zimbabwe/20170914/281844348802003

In Tanzania, the WRS was introduced in 2005 as one of the means to provide a viable solution to marketing problems (including issues of quality produce, price stability, bargaining power, tax collection and bulky yields).[5] The effective regulation of WRS was expected to curtail cheating on weights and measures; facilitate access to finance at all levels in the marketing chain; moderate seasonal price variability; and promote instruments to mitigate both production and price risks. The country is generally viewed to have moved far ahead in the formalization of WRS, compared to other Sub-Saharan African countries by instituting legislations on warehouse receipts (i.e. the Warehouse Receipt Act, 2005; the Warehouse Receipts Regulations, 2006; the Warehouse Receipts Regulatory Board - WRRB) (AFD/CTA/IFAD, 2014); and the new WRS Regulations of 2016.[6]

However, experience from the implementation of ACT/TAP programme suggests several handicaps in the operation of the WRS, especially in the context of smallholder farmers in the rural areas of Tanzania (ACT/TAP, 2017). Smallholder farmers are not accessing the important services expected from WRS, such as financial services, improved agricultural inputs and good prices for their produce, and there is a general malfunctioning of the existing warehouses and storage facilities (see also FAO, 2010; Onumah, 2010). This malfunctioning results in the denial of smallholder farmers to benefits from the WRS and associated investment opportunities in agricultural production. Consequently, smallholder farmers become demoralized as production and price risks continue to be the major factors influencing their production capacity. Postharvest crop losses are still high (Mtaki, 2017; Kumar and Kaliata, 2017; Suleiman and Kurt, 2015; Abbas *et al*., 2014) and farmers are forced to sell their crops earlier during the harvesting seasons when prices are relatively very low, which results in low incomes and insecure livelihoods, particularly for smallholder farmers growing cereals and legumes.

Based on this understanding, ACT commissioned a study to investigate issues behind the underutilization of warehouse storage facilitates and general malfunctioning of WRS in Tanzania, especially in the context of smallholder farmers in rural areas, as part of advancing its advocacy activities. The study uses the case of cereals and pulses and was conducted in regions where ACT/TAP implements its phase II programme, specifically, in five districts within the SAGCOT region and in the Northern zone namely: Morogoro Rural, Mbozi, Mbarali, Kilombero, and Karatu districts. The results of this study will be used to advise the Government on proper WRS models that reflect the real needs of smallholder farmers in Tanzania, particularly in the cereals and pulse subsectors. The aim is to enable the smallholder farmers in rural areas take advantage of the existing opportunities in the implementation of WRS.

[5] The main objective of establishing Warehouse Receipts System in Tanzania was to foster the efforts of the government to formalize the existing marketing system aiming at minimizing various constraints hampering effective production and marketing of the agricultural produce (TWLB, 2013).

[6] http://www.wrs.go.tz/downloads/resources/WRS%20Regulations%202016.pdf

1.3 Study Objectives

According to the Terms of Reference (ToR) for this assignment, the general objective of the study was to investigate the capacity utilization of storage warehouses and challenges behind the improper functioning of the WRS within the cereal and legumes smallholder farmers' environment.

The specific objectives of the study were to:

i. Analyze the legal and regulatory frameworks governing the operations of the WRS Vs the level of implementation on the ground, with specific emphasis on the cereals and legumes smallholder farmers' environment
ii. Identify the number of warehouses in the selected districts, looking into whether their establishments were driven by farmers' needs, the time frame since they were established, how often they are utilized, size of the warehouse Vs the real storage volumes during on-season
iii. Analyze the smallholders farmers situations with respect to operational procedures of the WRS - production and income levels, organizational structures, leadership capacity, knowledge/understanding/awareness, their levels of engagement in the establishment of storage warehouses, ownership of storage facility, issues of location Vs farmers' fields (transport facilities)
iv. Assess the practical application of the WRS in comparison with collective marketing in smallholder farmers' environment and identify the areas where the two systems can work in synergy to come up with a system that is practical to smallholder farmers especially for cereals and pulses
v. Identify whether there are best practices in WRS operations for smallholder farmers within the East African Community (EAC) and Southern African Development Community (SADC) regions with regards to cereals and pulses.
vi. Investigate other institutional frameworks that may be constraining the operations of WRS in smallholder farmers apart from legal and regulatory frameworks which if holistically taken care of will contribute to improvements of WRS
vii. Based on the assessment of farmers' situation, suggest on the estimated average specifications of the storage warehouses appropriate for cereals and legumes Smallholder farmers so as to take advantage of the available opportunities.
viii. Recommend on the practical and beneficial system for cereals and pulses taking into account the situation of Tanzanian smallholder farmers.

The Terms of Reference (ToR) for the consultancy have been attached to this report as Appendix 1**.**

2. THEORETICAL AND CONCEPTUAL FRAMEWORKS

2.1 A Review of Commodity-backed Finance Instruments

2.1.1 An overview

In most emerging markets, the lack of acceptable collateral is often cited as a key constraint on the provision of credit to agriculture. Three main types of collateral are typically used to finance agriculture: farmland, equipment, and agricultural commodities. In many economies, however, the ability to use farmland as collateral is hindered by the absence of land titles or by inefficient land markets. Likewise, mortgaging or leasing out equipment is not always possible due to the lack of mechanization in agriculture, the absence of a legal and regulatory framework conducive to leasing, or limited secondary markets for equipment in case of default. As a result, the third option—use of agricultural commodities as collateral—is increasingly being explored in various countries, particularly in Latin America, South Asia, and East Africa, where financial institutions have developed credit products that use commodities as collateral for lending. Such agricultural commodities have an established value and market where quick liquidation mechanisms can in theory provide sufficient funds to cover a loan extended against them in case of a default.

While commodity-backed finance refers to both pre-harvest finance (pledge of future production) and post-harvest finance (pledge of existing inventories), using commodities as collateral is more common for post-harvest finance for a few reasons. Post-harvest finance notably leverages tools (presented below) that are simpler to put in place—that is, securing existing commodities is a less challenging task than securing commodities that have yet to be produced.

As a result, commodity-backed finance using inventories as collateral should in theory enable borrowers to convert the riskier and more expensive credit they had been using to finance production to the more secure and better-priced credit after harvest. For traders and processors, the ability to access credit using commodities enables them to purchase the needed commodities during harvest, when their seasonal financing needs are significant and usually not covered by fixed assets. For producers and producer associations, the ability to access post-harvest credit enables them to sell their crop deliberately over time rather than all at once immediately after harvest, when prices are usually low. Thus, a financial instrument like commodity-backed finance can enable producer organizations and cooperatives to strengthen their negotiation power in the market by allowing them to defer sales until they are offered reasonable prices. It can also enable them to pay their members without having to wait for the actual sale of the products.

Overall, commodity-backed finance using agricultural inventories is an important component of a holistic approach to making agricultural credit and professional storage more accessible. In turn, more accessible credit and storage can contribute to food security by (a) increasing local food processing capacity; (b) reducing post-harvest losses; (c) improving the quality of the

goods stored under better conditions; and (d) potentially improving incomes for farmers (through a combination of lower post-harvest losses and better prices from delayed marketing).

2.1.2 Main types of commodity-backed finance instruments

There are three main types of commodity-backed finance instruments using inventories as collateral: warehouse receipt systems, collateral management agreements, and stock monitoring agreements.

As already defined, the warehouse receipt system (WRS) is a system that enables warehouse operators to issue receipts as evidence that specified commodities of stated quality and quantity have been deposited at a particular location by named depositor(s).[7] The warehouse operator holds the stored commodity in safe custody, and the depositor can use the receipt as collateral to borrow from banks.

In Tanzania, a warehouse operator is required to meet requirements and standards specified in the Warehouse Receipt Act No. 10 of 2005. Section 6(1) (l) of the Act gives powers to the Tanzania Warehouse Receipts Regulatory Board (WRRB) to set guidelines and standards of the depositors. The standards that apply to the WRS in Tanzania, for paddy, rice, maize and legumes are depicted in Table 1. Others include the East African Community (EAC) standards that adopted by the East Africa Grain Council G-SOKO platform (Appendix 4).

Table 1: Standards used in the warehouse receipts system in Tanzania

Name of commodity	Packaging	Weight (kg)	Max. Moisture Content (%w/w)	Annual Allowable Shrinkage (%)
Paddy	POP	75	10	2
Rice	POP	50	8	2
Maize grain	Jute/Sisal/POP	90	7.5	2
Beans, grains	Jute/Sisal/POP	90	10	2

Source: Abstracted from TWLB (2013)[8]

[7] A warehouse operator is defined in the Warehouse Receipts Act of 2005 as a legal person engaged in the business of operating a warehouse for checking quality, receiving, storing, and delivering according to the instructions of the owner of the commodities and upon Receipts of the prior issued Warehouse Receipts and other required document.

Section 16(1) of the Act and Regulation 28 requires any Warehouse Operator to be licensed by the TWLB.

[8] TWLB (2013). The Warehouse Receipts System Operational Manual. Made Under Section 6 of Warehouse Receipts Act No. 10 of 2005 Version 2. Dar es Salaam.

The law and regulations require the licensed warehouse operator to execute the followings:

a) Certify grading of the commodity before weighing
b) Weigh the commodity
c) Tally the number of packages
d) Receive, store, and deliver the commodity as per Warehouse Receipts without discrimination
e) Separate the commodity covered by each owner unless stated otherwise
f) Display approved schedule of charges for services
g) Ensure the quality and quantity of the stored commodity is preserved during the time of storage
h) Prepare all documents as required by the law
i) Keep in a secured place a complete and accurate set of all records and accounts for all transactions pertaining to the respective commodity in which Warehouse Receipts was issued;
j) Pay all fees, levies and taxes to the WRRB, local and central governments respectively, and
k) Before licensed, file with WRRB a bond of equivalent amount as may be prescribed by WRRB.

Farmers, traders, processors, and any other owners of commodities can deposit their commodity in licensed and inspected third-party warehouses. Banks provide funding at some discount of the value of the warehouse receipt to account for the storage and financing costs, as well as factors such as price volatility history, the robustness of the system, and the trust they put in the warehouse operator.[9] As a result, even though loans tend to be around 60–70 percent of the value of the crop, there can be significant variations, from as low as 50 percent to as high as 80 percent of the crop's value.

In Tanzania, Section 32(2) (a) of the Warehouse Receipts Act of 2005 provides for the financial institution to acquire proprietary right of the commodity if it has a binding commitment to extend loan whether or not drawn. However, by having a proprietor right of the commodity it does not imply that the financial institution is granted the power to sell the commodity at the time of storage. The country's Financial Regulations, embrace the approach of issuing credit not exceeding 75% of the total value of the commodity in question. WRRB advises the use of minimum weighted average of historical prices of specified commodity markets for at least past five years. Where the indicative price is determined by stakeholders, the financing institutions are advised to focus on the prevailing and historical marketing situation before paging the rates and amount of financing.

When the depositor sells the receipt and therefore the underlying crop in storage, the bank must be paid by the buyer before it releases the receipt; once released, the receipt must be

[9]Even within a WRS, banks may prefer to deal with some but not all warehouse companies that issue warehouse receipts.

presented to the warehouse alongside payment of storage and handling costs and fees in order to have the inventories delivered to their new owner. Several countries have warehouse receipt systems in place, including Argentina, Brazil, Colombia, Cote d'Ivoire, Ghana, India, Indonesia, Kenya, Malawi, Mexico, South Africa, Tanzania, and others.

A collateral management agreement (CMA) is a three-party agreement between the commodity owner/borrower, the collateral manager, and a bank (although in some cases a fourth party, the buyer, is added). CMAs can be used in countries that do not have a formal WRS, but they can also coexist with a WRS. Under a CMA, the collateral management company issues a certificate of deposit that the borrower can use as collateral to obtain a loan. When the goods are sold, the bank gets paid first and then authorizes the collateral manager to release the inventories to the new owner. For greater security, the certificate of deposit can be registered at a collateral registry.

The key issue in CMAs is the trust between the three parties, and particularly the trust in the specific collateral management company that ensures the integrity of the warehouse and the quantity (and sometimes the quality) of the goods stored and used as collateral. The collateral manager is a professional firm, usually comparatively large and well-capitalized, that has the skills to manage inventories and is trusted by the bank. Many collateral management firms offer performance guarantees, or have sufficient skills and capital, to ensure that banks are compensated even in cases of fraud. Some banks have their own fully-owned subsidiary collateral management company so they can exert better control over its operations (e.g., Banorte in Mexico).

A stock monitoring agreement (SMA) is an agreement by which an inspection company periodically monitors inventory levels (and sometimes the quality) of commodities stored or shipped to a location, with the aim of ensuring traceability. Traders and processors who hold inventories in their own warehouses often use SMAs to obtain seasonal credit for purchasing crop after harvest. Since the inventories that could be used to satisfy the loan are held on the owner's premises, banks use the services of a stock monitoring or Inspection Company to periodically (e.g., weekly or even daily) monitor the inventories.

This is a much less secure form of collateral compared to WRS and CMA for the banks. The degree of control over monitoring varies. In Ethiopia, for example, banks hold the key to the warehouse and a bank employee is on standby to open the warehouse as needed, even though that warehouse belongs to the trader or cooperative. In Vietnam, banks post employees during working hours to supervise the warehouse of a processor or trader whose inventories they finance. In Mexico, stock monitoring is done by employees of a company hired by the bank to inspect warehouses randomly at least once a week. Banks tend to arrange SMAs with clients they have other financial dealings with and whom they trust. Clients who prefer SMAs are often processors who need the convenience of accessing inventories on their own premises to keep their production line moving.

It should be noted that CMAs and SMAs tend to rely on the usual contractual laws of the country and do not usually need the enactment of specific legislation. AWRS tends to rely on laws and regulations specifically related to the WRS, often within the broader context of a legal and regulatory framework for secured transactions. For example, countries with a WRS often have a dedicated warehouse receipts law and institutional arrangements for licensing and inspecting third-party warehouses that issue receipts. The additional cost and effort required to set up and operate a WRS can be justified by its increased reach and inclusiveness. CMAs and SMAs are often accessible only to more establish players already having track records with banks, and they tend to be concentrated in the country's main city or port. By contrast, a WRS can in theory offer access to commodity-backed financing to a wider range of market players, such as producers or smaller traders and processors; it does so by reducing the transaction cost related to due diligence for all the parties involved (the depositor, warehouse operator, and bank). Indeed, in Ethiopia and Tanzania, the volumes of crops transiting each year through a WRS add up to hundreds of thousands of tons; in South Africa, they add up to millions of tons. Moreover, about US$45 million in loans have been facilitated through WRS, and 50,000 farmers have been reached through the incipient WRSs in Côte d'Ivoire, Kenya, and Malawi, whose development is being supported by ongoing World Bank Group projects.

2.1.3 Other types of commodity-backed finance instruments

In addition to financing using existing inventories as collateral, there are other types of commodity financing agreements that use future (pre-harvest) production as a pledge for financing.

Crop receipts are a form of pre-harvest finance instruments that allow farmers to access credit by pledging a future crop. A good example is the CPR (*Cedula Producto Rural*) system in Brazil. Although such a system offers benefits, it requires a large number of preconditions, since the pledge is for collateral that does not exist (the future crop) at the time the loan is granted. A lot of risks must be managed in order for banks to be comfortable lending against such future crop pledges; usually such systems require crop insurance, price hedging mechanisms, etc. to reduce such risks. Most beneficiaries of crop receipts in Brazil tend to be medium and large commercial farmers. With all these preconditions, crop receipts are not very common outside Brazil, although recently there have been some efforts to pilot crop receipts in certain large grain markets in Eastern Europe and Central Asia.

Value chain finance in contract farming is another form of pre-harvest finance. It relies on new technologies in logistics, communication, product traceability, etc. that bring large buyers into contact with smallholder producers, and enable the provision of credit and other products and services to these smallholders. This form of finance is used within tight value chains in which a large buyer contracts (formally or informally) to purchase from farmers and also provides them with technical assistance, inputs, crop monitoring, price certainty, etc. In such circumstances, banks may be willing to finance farmers using such contracts as collateral. There are three main categories of value chain finance arrangements:

a) Banks finance the off-taker (large buyer), which then finances the smallholders, usually by providing inputs for free and deducting the input costs when farmers deliver the crops. The buyer reimburses the loan to the bank in the end.
b) Banks finance farmers directly through the off-taker. When farmers deliver crops to the buyer, the buyer is the one repaying the loan to the bank by deducting from the amount owed to the farmer the amount needed to repay the loan and sending it to the bank.
c) The off-taker may take part of the risk (first-loss partial guarantee or risk share) to provide additional security to the bank regarding loan default.

There are also value chain finance arrangements in which an input supplier provides financing in the form of inputs to farmers through a local bank. Payment is deducted when the farmer delivers crops to the buyer. An example of such a scheme can be found in Ukraine, where the input supplier also provides a first-loss guarantee to the bank on the repayment. Perhaps the biggest risk in value chain finance is side selling, in which farmers deliver their crops to a buyer other than the one which provided pre-harvest finance and are therefore unable to repay the loan through the agreed upon deduction. Good monitoring of farmers by the buyer can reduce this risk, as can the structure of a well-organized and tight value chain (including, for example, central processing, premiums for quality, addressing perishability, links to high-value markets, etc.) and the physical characteristics of the commodity. Well-organized and tight value chains can be found in such commodities as poultry, dairy, cotton, sugar, aquaculture, fruits and vegetables, and high-value cash crops such as spices and specialty coffee and tea. Some relevant examples are dairy, poultry, and sugar finance in India, cotton finance in West Africa, and fruit and vegetable finance in South Africa, among many others.

In addition to the use of contracts (formal or informal) and purchase orders to finance future production, another form of value chain finance is receivable finance. In this approach, farmers obtain finance from banks with an invoice from the buyer issued after they deliver their crop that promises payment at a later date (e.g., in 30, 60, or 90 days). The main risk for such receivable finance is that the buyer (usually a large local or international company) will not pay; from the bank's perspective, this is more or less equivalent to the buyer's credit risk, which should be much lower than the farmer's. In effect, receivable finance converts the credit risk of the farmer into the credit risk of the buyer. Several countries (Chile, China, and Mexico, among others) have dedicated receivable finance platforms that enable various financial institutions to finance invoices and receivables.

2.2 Conceptual Framework for the Study

The study adopted a WRS conceptual framework presented by FAO (Figure 1)[10] which starts with a farmer or producer depositing agricultural goods in a warehouse (1). The warehouse

[10] Effective legal and regulation frameworks are that which achieve the policy objective that led to it being made. Efficient regulation achieves these objectives at the lowest total cost – to all members of society. Efficiency and effectiveness are important because there are limits to the amount and type of regulation able to be absorbed within economies and enforced effectively by governments.

then issues a receipt to the producer (2) who can then use it as collateral (3) to obtain a loan from a bank or agricultural inputs supplier (4). The loan is for a specified percentage of the market value of the goods in storage, depending on the lender's assessment of risk. The conceptual framework indicates furthermore that putting goods in storage allows producers to extend the period in which they are able to sell the harvested goods and to wait until more favourable market conditions arise. Upon maturity or in favourable market conditions, the producer sells the stored goods underlying the warehouse receipt (5). Depending on the agreement, the buyer either pays the creditor directly (6) or pays the producer who in turn pays the creditor. Upon loan repayment, the creditor returns the warehouse receipt (7) and allows the buyer to go to the warehouse, present the receipt (8) and retrieve the bought goods (9). Should the producer default and fail to repay the loan upon maturity, the lender holds the warehouse receipt and the ability to seize and sell the underlying stored goods to recover its loss (*ibid*).

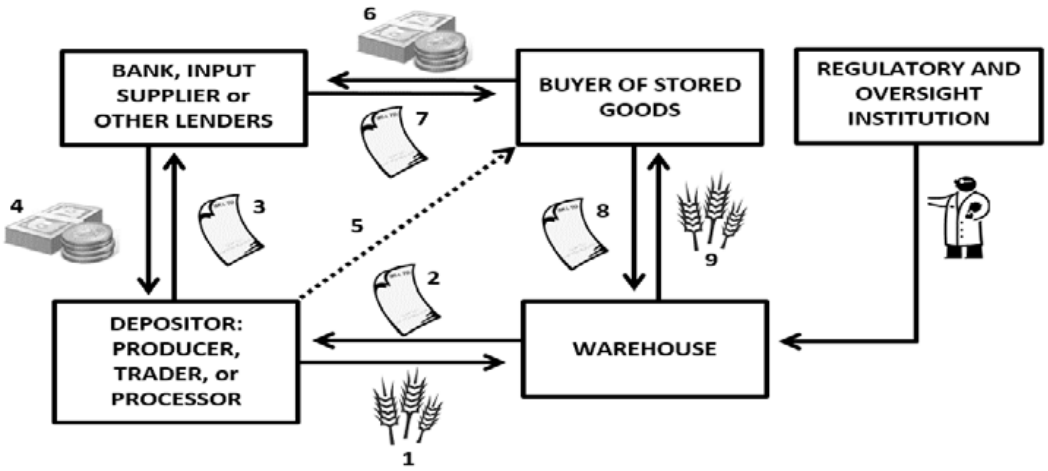

Figure 1: The WRS conceptual framework (FAO, 2015)

The effectiveness and efficiency of legal and regulatory frameworks governing the implementation of the WRS and the level of implementation were evaluated using the yardstick of how different players in the WRS understand and perform their respective roles and functions. This in turn informed the identification of existing bottlenecks and opportunities for improvement.

3. STUDY APPROACH AND METHODOLOGY

3.1 Study Districts

The study was conducted in five districts namely Kilombero, Mbarali, Mbozi, Morogoro Rural, and Karatu Districts. A brief description of each of the five districts is presented in the following subsections.

3.1.1 Kilombero District

Kilombero district, currently subdivided into Kilombero District Council and Ifakara Town Council, is situated in a vast floodplain, between Kilombero River in the South-East and the Udzungwa Mountains in the North-West (Kilombero District Council, 2017).[11] The district lies between latitudes $70^0$40' and $9^0$21' South of the Equator and between longitudes $35^0$20' and $37^0$48'East of Greenwich (*ibid*). It shares borders with Kilosa and Morogoro Rural District to the North East, Mufindi and Njombe to the Southwest and Kilolo District to the North, Ulanga District to the South East and Songea Rural District to the South. According to the 2012 National Population and Housing census, Kilombero District had a total population of 301,456 (151,654 males and 149,802 females). The total number of households was 94,855 with average household size of 4 people. The district covers an area of 1,491,800 ha (14,918 km^2) distributed into different land uses as shown in Table 2.

Table 2: Area and proportion of land uses in Kilombero district

Category	Area (ha)	%
Arable land	445,896	29.9
Pastureland	120,000	8.0
Water/wetland	107,626	7.2
Natural Forest	125,000	8.4
Forest Reserve	107,915	7.2
Planted Forest	6,698	0.4
Settlements	578,665	38.8
Total area	**1,491,800**	**100.0**

Source: Kilombero District Council (2017)

The district is characterized by high temperatures and a bimodal rainfall regime with shot rains beginning towards the end of November and ending in January or February. Long rains usually start in March and ends in May or June. The average temperature and mean annual

[11] Kilombero District Council (2017). Updated District Profile. Ifakara Kilombero.

precipitation in the district range from 26^0 to 32^0C and 1200 to 1600mm respectively.[12] The major food crops in the districts are paddy, maize, beans and cassava with annual production estimated at 23,159 tons; 92,905 tons; 23,159 tons; and 69,840 tons respectively (Kilombero District Council, 2017).

The district is divided into three zones namely; the North-eastern, Central and Western Zones (*ibid*). The North-eastern zone includes the Kidatu and Mang'ula Divisions while the Central zone covers the Ifakara Division and the Western zone covers the Mngeta and Mlimba Divisions. The crops grown in the North-eastern zone are paddy, maize, sugar cane, and a variety of horticultural crops, including okra, amaranthus, tomato, Chinese cabbage, orange, mango, pawpaw and pineapple, just to mention few. Other crops include banana, sweet potato and cassava. The common crops grown in the Central zone are paddy, maize, cassava, vegetable and fruits (oranges, mangoes and pawpaw). Farmers in the Western zone grow maize, paddy, bananas, cocoa, sunflower, simsim, cassava, vegetable and fruits. Sugar cane and rubber can also be grown in the zone (*ibid*). The focus crop for the WRS study in Kilombero District was paddy.

3.1.2 Mbarali District

Mbarali District is located between latitude 7^0 and 9^0 South of Equator and longitude 33.8^0 and 35^0 East of the Greenwich meridian (Mbarali District Council, 2017). The district is bordered by Chunya District to the north, Iringa Rural District to the North-East, Wanging'ombe and Mufindi Districts to the East, Makete District to the south, and Mbeya Rural District to the west. The district is divided into two administrative divisions namely Ilongo and Rujewa.

According to the 2012 national population census, the district's total population was 300,517 people in 2012, including 145,867 males and 154,650 females (*ibid*). The district is located at altitudes of about 1,000 to 1,800m above the sea level. It is characterized by a unimodal rainfall regime with rains falling from December to April, averaging between 450 and 650mm per annum and temperatures ranging from 25^0C - 30^0C (*ibid*). The total area of the district is 1.6 million ha split into different land uses as shown in Table 3.

[12] The district experiences seasonal flooding which causes some parts of the district to be inaccessible during the long rain season.

Table 3: Area and proportion of land uses in Mbarali district

Category	Area (ha)	%
Arable land	321,500	20.1
Pastureland	154,000	9.6
Settlement	124,500	7.8
Forest reserve	40,000	2.5
National parks, wildlife management areas and game reserves	9,600	60
Total	**1,600,000**	**100**

Source: Mbarali District Council (2017)

The district is divided into two agro-ecological zones namely; the Usangu flat lands and Usangu flats Boarder (*ibid*). The Usangu flat land zone covers the wards of Ruiwa, Ubaruku, Utengule Usangu, Mahongole north, Igurusi, Chimala, Mapogoro, Rujewa, Mawindi north, and Madibira. It is characterized by sub-tropical forest, sub-tropical grasslands and thorn bushes. The main crops grown in the zone include paddy, maize, beans, cassava, groundnuts, sorghum, vegetable and fruits. The Usangu flats border covers the wards of Mawindi south, Rujewa, Mapogoro, Chimala and Mahongole south. The zone is characterized by sub-tropical forests, grasslands and thorn bushes.

The major crops grown in the zone are maize, sorghum, beans, cassava, groundnuts, sweet potatoes, vegetables and fruits. The district is one of the major paddy producing areas in Tanzania. Paddy was therefore selected as the focus crop for the WRS study in Mbarali District. The available statistics indicate that paddy production in the district has increased substantially over years: for example, production has increased from 134,573 tons 2011 to 223,198 in 2015 (Figure 1).

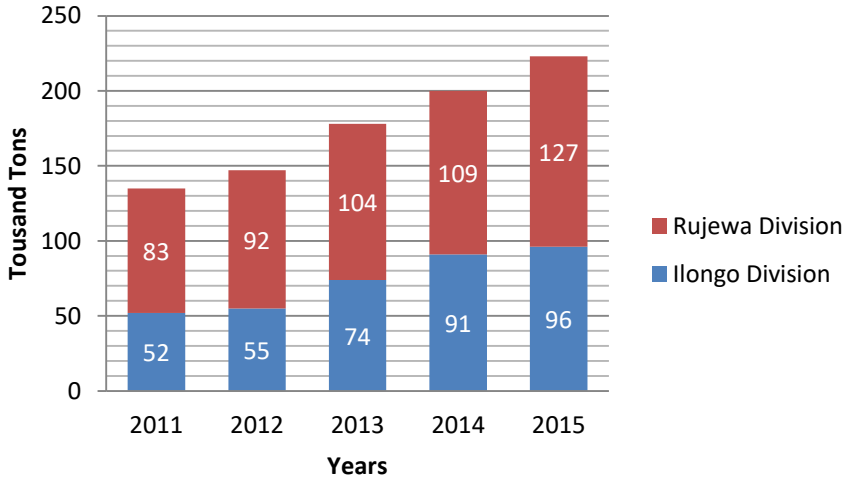

Figure 2: Paddy production in Mbarali District, 2011 – 2015 (Source: Mbarali DC, 2017)

3.1.3 Mbozi District

Mbozi district is located between latitudes 8^0 and $9^0$12' South of Equator and longitudes $32^0$7'30'' and $33^0$2'0'' East of the Greenwich Meridian (Mbozi District Council, 2017). The district is bordered by Mbeya district to its eastern part, Ileje district to the south, Momba district to the western and Chunya district to the north. According to the 2012 population census, the district had a total population of 446,339 people in 2012, of which 213,217 were males and 233,122 were females. The total area of the district is 3,404 km^2, equivalent to 340,400 ha, distributed into different land use categories as summarized in Table 4.

Table 4: Area and proportion of land uses in Mbozi district

Category	Area (ha)	%
Arable land	255,300	75
Forest reserve	34,040	10
Settlement and other uses	44,252	13
Area covered by water	6,808	2
Total area	**340,400**	**100**

Source: Mbozi District Council (2017)

The district is located within a high plateau zone at altitudes ranging from 1,400 – 2,750 meters above the sea level. Its topography includes several hills, rivers and valleys. The climate of the district is characterized by moderate temperatures and high precipitation. On average, the district receives rainfall ranging from 1350 mm - 1550 mm per annum and temperatures of between 20^0C to 28^0C (Mbozi District Council, 2017).

Agriculture is the main economic activity in the district employing 88% of the total (*ibid*). Crop production is mainly done by smallholder farmers, 50% of whom using hand hoes, 40% using animal draught power, and 10% using motorized equipment such as tractors (*ibid*). The major crops grown in the district are coffee, maize, common beans and banana, and to some extent Irish potato, sweet potato and paddy. The focus crops for the WRS study in Mbozi District were maize and common beans.

3.1.4 Morogoro Rural District

Morogoro Rural District is located between latitudes $6^0$00' and $8^0$00' South of Equator and Longitudes $36^0$00' and $38^0$00' East of Greenwich (Morogoro District Council, 2013). The district is bordered by the Bagamoyo and Kisarawe districts to the east, Kilombero district to the south, and Mvomero district to the north and west. The district has a total area of 11,925,000 ha out of which 7.14 million ha is forest area (equivalent to 60% of the total area of district) (*ibid*). The area covered by natural and planted forests amounts to 7,096,582 and 43,418 ha respectively

(*ibid*). Protected forests cover an area of about 117,100 ha, while productive forests cover 3, 163.7 ha (*ibid*).[13]

According to the 2012 Population and Housing Census, the district had a population of 286,248 people in 2012 (140,824 males and 145,424 females). It is characterized by a bimodal rainfall regime with long rains (*masika*) lasting from March and May, peaking in April and short rains (*vuli*) lasting from October to December. Mean rainfalls vary from 600mm in flat areas up to 300mm in the mountainous areas and temperatures range from 20^0C to 30^0C (*ibid*). The long rains last from March to May, peaking in April and the short rains last from October to December.

Agro-ecologically, the district is divided into three zones namely the Highland zone, Lowland zone, and Savannah zone. The highland zone is covered by the Montane forest and accounts for 25% of the total area of Morogoro Rural District with annual rainfall averaging between 1000 – 3000mm (*ibid*). The area is suitable for growing beans, parsley (*iliki*), coffee, tea, vegetables and fruits. The Lowland zone is dominated by the Miombo woodland and occupies about 20% of the total area of the district. The zone is located at altitudes ranging from 600m - 1200m above sea level. The average annual rainfall in the zone ranges from 1000 – 2000mm and the mean temperature is 29^0C (*ibid*). The Savannah zone is predominantly covered by Savannah woodland and occupies the largest part of the district (55%), located at altitudes ranging from 600m to 800m above the sea level. The average annual rainfall in this zone ranges from 900 - 1200 mm and the area is suitable for growing maize and rice.

Overall, maize is the predominant food crop grown in Morogoro Rural district followed by paddy and these two crops were therefore selected as the major focus for WRS study in the district. Estimates of cultivated areas and production for different crops in the district are shown in Table 5. Other food crops grown in the district include beans, rice, sorghum, cassava, and banana. The focus crops for the WRS study in Morogoro Rural District were maize and paddy.

Table 5: Paddy and maize production in Morogoro Rural district, 2015/16

Types of Crops	Target area (ha)	Target production (Tons)	Actual production (Tons)
Maize	39,429	70,973	27,593
Paddy	20,588	51,469	17,349
Sorghum	19,041	28,562	4,509
Banana	3,900	97,500	5,849
Cassava	14,603	43,829	11,496
Pigeon peas	2,214.10	2746.175	1326.7

Source: Morogoro Rural District Council (2017)

[13] See also: http://documents.worldbank.org/curated/en/362341501869412064/pdf/SFG3517-EA-P150523-Box405294B-PUBLIC-disclosed-8-4-17.pdf

3.1.5 Karatu District Council

Karatu District is located South of the Equator between latitudes 3°10'– 4°00'S and longitude 34°47' - 35°56' East of Greenwich. It borders the Mbulu District to the west, Ngorongoro District to the north, Babati District to the south-east, and Monduli District to the east. According to the 2012 national census, the population of Karatu District was 230,166 (117,769 males and 112,397 females) with a population density of 71.76/km^2 (Karatu District Council, 2017). The district occupies an area of 3,300 km^2 (330,000 ha) classified under land uses as shown in Table 6 (*ibid*).

Table 6: Area and proportion of land uses in Karatu district

Category	Area (ha)	%
Arable land	102,573	31.1
Pasture land	155,808	47.2
Forest, bush and tree cover	61,218	18.6
Lake Eyasi	1,060	0.3
Other land uses	9,341	2.8
Total area	**330,000**	**100**

Source: Karatu District Council (2017)

Based on relief, land physiographic and drainage pattern, the district can be categorized into three zones—uplands, midlands and lowlands—with altitude ranging from 1000 to 1900 m (Africa Conservation Tillage Network, 2011). Rainfall in the district is bimodal; the short rains fall (*vuli*) between October and December and the long rains (*masika*) between March and June. Rainfall may range from less than 400mm in the Eyasi Basin to over 1000 mm in the highlands with rain zones classified as semi-arid (300–700 mm/year) and sub-humid (700–1200 mm/year) respectively (*ibid*). The wettest month is April. Rainfall varies considerably between years, especially in the semi-arid region, where the coefficient of variation of annual rainfall is 30–40% (*ibid*). Duration and intensity of individual storms are unpredictable. Rainfall intensity can be very high, causing erosion, particularly at the onset of the rainy season when soils are bare. Temperature decreases with increasing elevation by about 0.6^{0}C for every 100 m (*ibid*). Mean annual temperature ranges from 15^{0}C in November (forest) to 24^{0}C at the level of Lake Eyasi, the coldest months are June–August, and the warmest October–April (*ibid*).

The principal crops grown in the district include maize, beans and paddy. Mbulumbulu and Karatu Divisions in the highlands produce wheat, barley, beans, maize, coffee, flowers, pigeon pea and safflower (Africa Conservation Tillage Network, 2011). Endabash Division in the midlands produces maize, beans, pigeon pea, sorghum, finger millet and sunflower. Previously, with adequate and well-distributed rainfall (> 800 mm), agriculture in the highlands was very productive but in recent years crop yields have declined, mainly due to unreliable rainfall (erratic precipitation and lower annual totals) and poor soil fertility (*ibid*). Households have responded by diversifying into producing Dolichos lablab, finger millet, sorghum and short-term maize varieties, which are more droughts tolerant (*ibid*). Maize and beans are primarily grown

as staple subsistence food crops but in some high-potential areas in the highlands, they are both cash and subsistence food crops (*ibid*). Maize intercropped with pigeon pea is the most common crop-production system in the highlands and midlands and the two constituted the focus crops for the WRS study in Karatu District.

3.2 Selection of Interviewees

Prior to actual field survey the types of key actors and stakeholders available in the study districts were thoroughly studied and identified. Notwithstanding the time limitation, the representatives of stakeholders and key informants were carefully considered to ensure that enough feedback from the actors/stakeholders is gathered while ensuring that the scale of the exercise is not too demanding of scarce resources. Two types of interviewees were purposely chosen: individuals who participated in WRS because of the peculiarity of the role they played in implementing the system and individuals who did not participate. The interviewees who participated in the implementation of WRS included the depositors (mainly farmers), warehouse operators, traders/buyers, financial institutions, regulators (Regulatory Boards, Central, Regional and Local Government), warehouse inspectors, and facilitators like RUDI.

3.3 Data Collection

Deskwork review was used as an invaluable way of obtaining information regarding the implementation of WRS in Tanzania and other parts of the world. In this regard, different websites were visited to download related information. Other relevant sources included official records and documents such as WRS research reports, WRS laws and regulations, and other relevant materials. The desk review helped to identify the best WRS practices and the available and missing data to be gathered during the fieldwork and consultations.

The study gathered both primary and secondary data. The primary data were collected using the interview guide for different actors and stakeholders as shown in Appendix 3.[14] Both quantitative and qualitative information was gathered. The quantitative information included

[14] The main stakeholders of WRS include the depositors, warehouse operators, buyers, financial institutions, warehouse inspectors, insurance companies, transporters, suppliers, information and communication (IT) companies, research and academic institutions, donor organizations, non-governmental organizations (NGOs), main regulators (Regulatory Boards, Central, Regional and Local Government, and other regulatory Boards, including institutions like Crop Boards, Tanzania Bureau of Standards, Weight and Measures Agency, Tanzania Food and Drugs Authority, Tanzania Revenue Authority, Tanzania Ports Authority and Tropical Pesticides Research Institute. The specific activities each of these stakeholders are listed in TWLB (2013). TWLB is the main regulator of the WRS in the country. Its functions are defined in section 5 of the WRS Act, 2005. The additional functions are also mentioned in Regulation 4.

among others, output prices, production costs, transaction costs, as well as the costs and benefits of operating a WRS.[15]

In cases where it was not possible to assess all of these costs and values quantitatively the qualitative information formed an important part of the analysis. The information gathered through consultation with different stakeholder groups was used as one of the most cost-effective ways to support the assessment of WRS legal and regulatory framework. The consultations helped to establish the legitimacy of the regulation, by allowing the stakeholders to raise concerns and participate in the process of identifying good WRS practices.

The qualitative information was presented in as clear and objective manner as possible using the Multi-Criteria Analysis (MCA) approach.[16] The underlying WRS policy objectives were identified and then the factors (criteria) that would indicate achievement of these objectives determined. The criteria were then ranked in terms of their relative importance and the interviewees were asked to score each individual WRS criterion based on performance. The weighted scores were then added together to determine the overall performance and identify options that would best meet the WRS policy objectives.

It is important to note that a large amount of relevant data was typically held by government agencies and NGOs like RUDI. For example, the LGA offices were a rich source of general information on issues such as the number of existing private and public warehouses for cereals and pulses in the study districts, the villages and warehouses involved in the implementation of WRS and the like. Therefore, the study team consulted different officials of the local and central governments to find out what information was already available. The consultations also helped the study team to evaluate if the establishment of warehouses was driven by farmers' needs and the levels of engagement in the process of establishing, owning and operating them.

The consultations also helped enrich the analysis of prevailing smallholder farmers' situation with respect to *modus operandi* of the existing WRS, their production and income levels, organizational structures, leadership capacity, knowledge and understanding, awareness of WRS procedures and regulations, utilization of warehouses, storage capacity and actual volumes stored per season. This information was useful in establishing the level of implementation (on the ground) compared to expected levels and making suggestions of average specifications of the storage warehouses.

The analysis of WRS regulatory framework in Tanzania was informed by information that was gathered about the core elements of WR legislation namely: the scope of its application and the

[15] Section 16(1) of the Warehouse Receipts System Act and Regulation 28 require licensing of warehouses which are used in WRS (licensed by the TWLB). Therefore there are costs incurred to establish and operate the WRS as well as an array of benefits accruing from the adoption of WRS. These have to be evaluated.

[16] MCA is a methodology that allows systematic and transparent decisions to be made even where quantification of major impacts is not possible.

commodities that were covered by warehouse receipts; institutional structure for the administration of the WRS; licensing and oversight of warehouses; performance guarantees for warehouses; contractual rights and obligations of the parties; warehouse receipts (their legal status, content, form and registration); negotiation and transfer of receipts; settlement and release of stored goods; execution and priority of obligation; offences and penalties, just to mention few.

3.4 Data Analysis

3.4.1 Analysis of legal and regulatory frameworks

The analysis of the legal and regulatory frameworks governing the operations of WRS was informed by the desk review and information gathered during the fieldwork. As already mentioned, the analysis focused on the smallholder cereal and legume sub-sectors. Specifically, the analysis involved the use of Regulatory Impact Assessment (RIA) approach[17] using the guides developed by APEX/Mexican Government (2013); OECD, (2013) and OECD (2008) along with the conceptual framework for WRS developed by FAO (2015).

RIA helped to identify which regulations were inefficient or ineffective and why. The aim was to ensure that regulations are efficient and effective as possible. Effective regulation is regulation that achieves the policy objectives that led to it being made. Efficient regulation achieves these objectives at the lowest total cost – to all members of society. Efficiency and effectiveness are important because there are limits to the amount and type of regulation able to be absorbed within economies and enforced effectively by the responsible authorities. Regulation has costs as well as benefits, and inappropriate regulation can stifle economic growth by putting obstacles in the way of doing business and by creating perceptions of a negative environment.

3.4.2 Analysis of costs, benefits and Other WRS Institutional Frameworks

The analysis of costs and benefits of participating in WRS were carried out using the Gross Profit Margin approach. The institutional frameworks that constrain the operation of WRS in smallholder farmers - apart from the legal and regulatory frameworks were investigated using the information gathered during the desk review and field consultations with key stakeholders. The best practices in WRS operation were identified and the practical application of the WRS in comparison with Collective Marketing in the smallholder farmers' environment evaluated to identify areas where the two systems can work in synergy and come up with a practical model for cereal and pulse smallholder farmers in the study districts.[18]

[17] RIA is a comparative process-based approach used to determine the underlying regulatory objectives and identification of all the policy interventions to achieve them.

[18] Available evidence suggests that the formation of rural producer organizations (RPOs) can facilitate the collective marketing of smallholder produce, thus enable farmers to achieve economies of scale and negotiate better prices, bypassing local middlemen (Latynskiy and Berger, 2017).

4. PRELIMINARY CONSIDERATIONS FOR WAREHOUSE RECEIPT SYSTEMS

4.1 Overview

There are four key considerations for WRS. These include: a) an effective legal and regulatory framework; b) institutional support; c) support to storage infrastructure and practices; and d) awareness and capacity in the use of commodities as collateral. These considerations are discussed in the following subsection.

4.2 Key Considerations

4.2.1 Legal and regulatory framework

Warehouse receipt systems tend to require a relatively complex dedicated legal and regulatory framework. Commodity-backed finance instruments using inventories as collateral (i.e. WRS, CMAs and SMAs are usually governed by the country's commercial contract laws, although some countries, like Côte d'Ivoire, do have specific laws for collateral management. According to the World Bank (2016), the key features of the warehousing legislation that are necessary for the success of the regime are:

a) Clear and comprehensive formulation of the rights and obligations of warehouse operators to depositors and other holders of warehouse documents
b) Licensing, supervision and inspection of warehouses and warehouse operators by an independent agency
c) Clear and comprehensive formulation of the rights and obligations of warehouse receipt holders as against transferors of warehouse documents
d) A comprehensive scheme for determining the relative priority of competing interests in the goods covered by warehouse documents
e) Clear and simple procedures for the transfer (by assignment or negotiation) of warehouse documents
f) Provision for a public registry in which the issuers and holders of warehouse documents may give notice of their interests and prospective lenders or purchasers may confirm the validity and subsequent transfer to themselves, and
g) A simple and speedy enforcement process.

The core elements of warehouse receipt legislation are: administration; licensing and oversight of warehouses; performance guarantees for warehouses; contractual rights and obligations of the parties; the legal status, content, form and legislation of warehouse receipt; negotiation and transfer of warehouse receipt; settlement and release of stored commodities; execution and priority obligations; and offences and penalties. Notwithstanding the shortfalls in enforcement, these core elements are adequately covered in the legal and regulatory framework for WRS in Tanzania notably, the Warehouse Receipt Act, 2005 and the Warehouse Receipts Regulations of 2006 and 2016.

The WRS Act of 2005 established the Warehouse Receipt Licensing Board (WRLB). It stipulates the functions and powers of the board (Part II), financial provisions (Part III), licensing procedures (Part Iv), warehouse receipts (Part v), rights and obligations of warehouse operators (Part VI), negotiation and transfer of warehouse receipt (Part VII), offences and penalties (Part VIII), and miscellaneous provisions, including powers to make regulations.

The new WRS Regulations, 2016 stipulates the procedures and requirements for implementation of the WRS in the country, including the following:

a) Operations of the WRS Regulatory Board (Part II)
b) Meetings, tenure, functions and operation costs of the Supervision Committee (Part III)
c) Functions and rights of Collateral Manger (Part IV)
d) Licenses and licensing procedure (Part V)
e) Duties and rights of different key actors (e.g. financial institutions, depositors, warehouse operators, buyers, and inspectors (Part VI)
f) Bonds, insurance and other securities (Part VII)
g) Form, printing, approval and other issues of WRS (Part VIII)
h) Delivery of goods (Part IX)
i) Inspection, grading and weighing (Part X)
j) Care of goods and safety of records (Part XI), and
k) General provisions, including the procedure for compounding of offences, warehouse charges, identification of commodities stored, etc.

4.2.2 Institutional support

Institutional support to an agency in charge of licensing and inspecting warehouses is critical for any WRS to work. Such support is needed to enable the operations of a formal warehouse receipt system. The licensing agency can be a public, private, or public-private institution, depending on the country, and more specifically on what configuration will inspire trust in the WRS from depositors, warehouse operators, and financial institutions.[19]

[19] For CMA and SMA companies, there may be the need for licensing by a government authority based on minimum capital, demonstration of skills/professional competency, etc.

In Tanzania, WRRB is the government licensing agency under the Ministry of Industry and Trade.[20] This agency was established under the Warehouse Receipts Act No. 10 of year 2005. The board performs different functions, including licensing of warehouse business, warehouse operators and inspectors and administering the WRS at large. According to the new WRS regulations of 2016, the board is required to perform the following additional functions:

a) Carry out studies and researches aimed at developing a modern and efficient WRS
b) Promote the use of warehouse in the country
c) Coordinate WRS stakeholders' activities, including establishment of a stakeholders' platform or forum for information sharing and general assessment of WRS development
d) Receive, assess and determine complaints among key actors and other interested parties
e) Collect, analyze and disseminate WRS information to stakeholders,
f) Establish and maintain a stakeholder's directory, and
g) Collect various types of fees as prescribed in the fourth schedule of these regulations.

According to sub regulation 5 (1), the board is required to keep and maintain a register for each category of key actors. The register should contain the following: a) name and address of key actors; b) date of commencement of business; date of commencement of warehouse operations; d) qualification, area of operations, capacity, and other vital operational data which may be obtained by the Board [sub regulation 5 (3)].

4.2.3 Support to storage infrastructure and warehousing practices

An assessment of suitable warehouse facilities that could qualify for storage is often needed to identify gaps in the storage infrastructure's quantity and quality. Section 16(1) of the Warehouse Receipt Act of 2005 and the Warehouse Receipts Regulations of 2016 (Regulation 28) requires any warehouse which shall be used in WRS to be licensed by the WRRB.

The qualification of warehouses, made under Regulation 33 of the Warehouse Receipts Regulations recognizes two types of warehouses depending on their uses: primary and secondary warehouses. The primary warehouses are used by farmers, farmers' business group, companies and cooperative societies whereas the secondary warehouses are used by traders, processors and exporters. The qualification critical points for the size of warehouses are:

a) Calibrated and certified weighing equipment
b) Strong and properly finished floor, proper roofing and walls for building and silos
c) Appropriate metal fire proof safe and serviced fire fighting equipment
d) Reliable security system which includes light during the night and security guards or other security system
e) Strong and properly fixed doors and windows, and

[20] http://www.wrs.go.tz/includepage.php?page=about_twlb

f) A warehouse must have a commercial storage capacity as prescribed by WRRB from time to time depending on the type of the commodity.

Table 7 provides the distribution of warehouse qualification score points.

Table 7: Warehouse qualification score points

Item	Score Points
Proper loading/unloading shade	8
Surrounding area clean and in good order	6
Effective locator	4
Standard pallets	8
Proper power and water system	8
Reliable communication systems (postal address, fax, telephone, internet connection)	8
Properly fenced (e.g. barbed wire, fencing wire, concrete etc)	8
Sample room or sample box	2
Proper drainage system	8
Proper rodent control system	8
Proper ventilation system	8
All weather accessible road	10
Furnished office	6
A foundation must be free from floods	8
Total Points	100

Warehouses are assigned grades "A" or "B" or "C" depending on the total score points: grade "A" is assigned when the warehouse scores 75 or above; grade "B" is assigned when the warehouse scores between 60 and 74; and grade "C" is assigned when the warehouse scores between 40 and 59 points. Any warehouse which fails to fulfil any of the critical points and scores below 40 points is disqualified by WRRB.

Support to storage infrastructure and warehousing practices is crucial. Very often, smallholder farmers lack the capital to construct own warehouse facilities that qualify for WRS operation, they need support. In some countries, governments provide financing through commercial banks for the upgrade, rehabilitation, or even construction of warehouses that cater to smallholder farmers (e.g., Mozambique, Sri Lanka, and Mexico). In Mozambique the BOM Bank, which had an outreach program of 5,000 "banked" farmers in its database in 2015, has facilitated the electronic warehouse receipt trade using an IT system developed by the USAID's South Africa Trade Hub.[21] Cargill has been the first company to issue the electronic warehouse receipts in Mozambique. The farmer delivered one ton of maize to the weighbridge site, was registered by the system, collected his warehouse receipt copy, received a loan approval, and walked away with his grain safely stored at the Cargill site and a loan to purchase further inputs.

[21] See: https://www.satradehub.org/food-safety-and-production/154-warehouse-receipts-system-launches-in-mozambique

In Sri Lanka, the Warehouse Receipts Financing Project, under World Bank financing, has facilitated access to finance and quality storage by farmers during the whole cycle of production through electronic and negotiable instrument via warehouse receipt financing. The arrangement was restructured to entail financing of construction smallholder farmers and national warehouses.[22]

In Mexico, the Secretary of Economy created the National Registry of Warehouse Receipts and Merchandise (RUCAM), which includes public records and digital media operating in one national database. The Registry began operations in January 2015, and is the first major update in credit operations of this important Mexican industry—warehousing and distribution. Today, the Registry is an important tool in providing greater legal certainty to the financial market participants that rely on certificates of deposit and pledge bonds. Within this system, anyone can view the certificates, obtain the information electronically, and quickly record or document actions.

4.2.4 Awareness and capacity in the use of commodities as collateral

Efforts to increase awareness and capacity is important and should aim at various stakeholders, including producers, producer organizations, cooperatives, traders, and agricultural processors, as well as at the financial institutions that would be developing suitable lending products and procedures related to use of commodities as collateral.

In Tanzania, WRRB, through its various projects and programmes, like the WIC Project advises farmers to join, establish and strengthen their VICOBA and SACCOS rather than relying solely on private and public financing institutions like NMB, CRDB, TADB and TIB as sources of capital, saving and lending services. NMB has been the major WRS financing in Tanzania, especially for coffee and cashew primary cooperative societies. Since it was difficult to obtain audited financial records of these societies, the bank placed much of its reliance on the financing structure. Thus, the following requirements were established by the bank:[23]

a) The borrower must be a primary cooperative society that produces a certain crop at a substantial volume
b) Registered and licensed warehouse operators must be used
c) Loan disbursal is made against commodities delivered in controlled warehouses
d) Buyers pay directly to a designated bank account
e) Assurance must be provided that the previous quantity of crop produced and sales proceeds are realized, and

[22] See: http://projects.worldbank.org/P124091/sl-warehouse-receipts-financing-project?lang=en

[23] See http://vinodkothari.com/wp-content/uploads/2017/08/Research-Paper-on-Regulatory-Aspects-of-Warehouse.pdf

f) Financing is capped at a pre-specified loan-to-value (LTV) ratio set for each crop according to price volatility and marketing arrangements, typically in the range of 50 - 90%.

WRRB has also being advising farmers to aggregate and deposit their commodities in warehouses as a group using, for example, their primary cooperative societies to take advantage of economies of scale. This would not only help them get loans from WRS financing institutions but also enhance their bargaining power through collective marketing, and lower the unit cost of operating the system (including the transaction costs, fumigation, insecticide, transport, warehouse staff fees and other costs).

In addition, the WRS Supervision Committees are required by the 2016 Warehouse Regulations to promote WRS in their administrative areas, clarify issues that arise during the implementation of WRS in their areas of jurisdictions (Regulation 11 b and c).

5. PERFORMANCE OF WRS IN TANZANIA

5.1 Operational Bottlenecks

This section presents a discussion of operational bottlenecks and overall assessment of the WRS performance in Tanzania as identified during the study. The interviewees in this study were asked to list and rank what they perceived to be the key WRS operational bottlenecks and overall performance respectively. The overall performance was evaluated and ranked using nine predetermined performance criteria as shown in the summary on results in Table 8. The operational bottlenecks were listed and presented as weighted percentages (Table 9).

Table 8: Results of WRS performance ranking by different stakeholders

Criteria	Kilombero	Mbarali	Mbozi	Morogoro	Karatu	Financiers	Overall
1. Administration	3	3	3	3	2	3	3
2. Licensing and oversight of warehouses	3	3	3	2	3	4	3
3. Performance guarantees for warehouses	4	4	3	3	2	3	3
4. Contractual rights and obligations of the parties	4	4	3	4	3	4	4
5. Warehouse receipt (legal status, content, form and registration)	4	4	3	3	3	4	4
6. Negotiation and transfer of warehouse receipts	3	4	3	2	2	3	3
7. Settlement and release of stored commodities	4	4	3	3	5	3	4
8. Execution and priority obligations	3	3	3	3	5	3	3
9. Offences and penalties	3	3	3	0	1	2	2
Average	3	4	3	3	3	3	3

NOTE: Performance ranks of 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good

Overall the performance of WRS was ranked as moderate (3). The highest average performance rank was reported in Mbarali District. The following subsections present a detailed discussion of the operational bottlenecks and performance of WRS as pointed out by different stakeholders in the study districts.

Table 9: Perceptions of interviewees on WRS operational bottlenecks

	Bottlenecks	%
1)	Lack of suitable WRS infrastructure (e.g. warehouses, state of the art warehouse equipment, agro-processing mills, feeder loads)	24
2)	Cumbersome/long lending procedure and high interest rates (lending priority for most formal banks is not to smallholder farmers)	18
3)	Unreliable markets, volatility in producer prices and regular bans in grain exports	14
4)	High WRS operational and transaction costs	12
5)	Lack of awareness and poor understanding of WRS (farmers were not effectively consulted and informed of the system)	11
6)	The main regulator (WRRB) lacks the resources to effectively conduct it full range of regulatory functions	10
7)	Political interference (e.g. conflicting interests between village leaders and farmer groups in warehouse infrastructure)	8
8)	Others	3
	Total	**100**

5.1.1 Perceptions of smallholder farmers

Interviews with representatives of smallholder farmers in the study districts indicated WRS financing as one of the major bottlenecks in implementation of WRS, at least in the context of smallholder farmers in the country. The interviewees viewed the existing financial institutions as very bureaucratic, complex and involving a long lending procedure which narrows the opportunity for smallholder farmers (AMCOS and farmers associations) to secure funds and benefit from the WRS. They viewed the first priority of many of financing institution as traders or business firms and not smallholder farmers, and that banks were charging very high interest rates that add to the total cost of WRS operation, which in turn erodes a huge share of farmers' profit margins.[24]

Just as important, the WRS was introduced prematurely as many stakeholders, especially the smallholder farmers were not well informed of the requirements, costs and benefits associated with the implementation of the system. Many stakeholders, for example, did not understand why a licensed warehouse operator is needed when organized farmers are using community or cooperative society's warehouses. The law requires that a warehouse operator should be a different entity from depositors to avoid conflict of interests. The new WRS regulations of 2016

[24] The National Microfinance Bank (NMB) charges interest rates off 19 – 20% for WRS bank overdrafts and a loan processing fee of 1.5%.

specify the duties of depositors (Regulation 33), as well as the respective rights of warehouse operators and depositors (Regulation 34 and 35).[25]

According to the 2016 WRS Regulations (Regulation 31), the services of warehouse operators are to: a) sample and grade commodities and issue official grade document; b) weigh commodities and issue scale tickets; c) issue print out in hard or electronic form of goods received or delivered to the depositors; d) store commodity in line with their grade specifications; e) maintain quality control and inventory management according to procedures prescribed in the regulations and any other additional exchange guidelines; and f) separate old stocks from new to avoid mix up.

As for the collateral manager or warehouse operator has the right to be paid lien which is described in the respective warehouse receipts and other charges as described and approved by WRRB (Regulations 34 and 13 of 2016). Some farmer groups have employed their own technical staff (e.g. the Madibira AMCOS in Mbarali district). Others, like the Mang'ula 'A', Vijana Mbasa, Katurukila, and Mbingu in Kilombero district have shown good progress and practicing WRS and collective marketing (market linkage). Unfortunately, most of these, especially in Kilombero district (e.g. Kikwawila, Mang'ula A, Mkasu, Vijana Mbasa, Mbingu) have suffered from the syndrome of politicking or conflicts over warehouse use and ownership with their respective village government leader.

Such conflicts have not only discouraged members of farmer groups, but also affected the operation of WRS and weakened the efforts by different stakeholders to support the construction and rehabilitation of warehouses used by farmer groups and associations.

Old warehouses (the by then cooperative warehouses) were rehabilitated by farmer groups with support from other stakeholders but the village governments take over them and rent them to private operators (e.g. the Vijana Mbasa case in Ifakara). In some cases these conflicts are heightened by the differences in political ideology and promises to voters as one of the leaders was quoted by FGD participants at Mang'ula "A" during his campaign:

> "… *When you vote for me, I will make sure that the village warehouses are taken from the ownership of MAFA and rented out to a private individual who will pay us more money* …."

Several stakeholders (e.g. the central government and LGAs; NGOs, like RUDI; and other donor agencies) have provided support and facilitated the construction and rehabilitation of community warehouses. In some places, farmers, through their organizations and individual contributions, have used their own fund to rehabilitate the facility. The Kikwawila warehouse in Kilombero District, for example, was rehabilitated in 2007 using a loan of TZS 756,280 from

[25] Note that, according to the 2016 WRS Regulation 15 (1) three types of licenses have to be applied for: warehouse operator license, collateral manager's license, and inspection license.

Vijana Mbasa, IPA SACCOS saving account (TZS 800,000), AKIRIGO Apex (TZS 200,000), and contribution from the then AKIRIGO manager (TZS 50,000). The total cost of rehabilitation amounted to TZS 1,806,280. When these facilities are not used for the purpose they were intended for (i.e., WRS operation), these support and efforts are abused. This has discouraged farmers, weakened the farmer groups making them less competitive. Community owned facilities have faced tough competition from warehouses owned by private individuals due to such conflicts.

Many of the private warehouses were reported to have operated at full capacity in 2016/17, even when the storage charge was higher e.g. TZS 2,000 – 3,000/bag, both in Kilombero and Mbarali districts). Unfortunately, many of these warehouses, especially those located in villages and some big centres, are often not regulated.

The study findings also show many stakeholders, especially the smallholder farmers had, little understanding and knowledge about the operation of WRS. For example, The WRS regulations and WRRB guidelines require the depositor to sign Form 16 obtained from the warehouse operator but none of the interviewed depositors indicated to recognize or to have used this form. Interviews with staff of the District Agriculture, Irrigation and Cooperatives (DAICO) in Karatu, also indicated that although some training seminars were conducted in the district by ACT/TAP in 2011, many stakeholders are still not aware of the system. More training is needed especially in the concept itself, WRS operation and management, preparation of business plans for application of loans.

Many stakeholders who were interviewed by the study team underscored the need to support the development of suitable WRS infrastructure and storage facilities as well as introducing tailor-made WRS financing mechanism that are suitable for smallholder farmers. Smallholder farmers, through their AMCOS and associations, need to be linked to lucrative markets by supporting the aggregation of their grains, facilitating collective marketing and introducing a reliable marketing information system to address the problem of information asymmetry.

Collection of grains stored in small volumes from spatially-scattered warehouses constituted one of the difficulties in implementing WRS. Just as important, when the grain is moved from the warehouses to the point of destination, transporters have incurred several costs, including some hidden costs like official and unofficial fines. In remote villages, roads are rough and hardly passable. All these increase the cost of transporting the grains.

Huge deposits of grain are required for the warehouse operators and depositors to generate reasonable/positive net returns. When little grain is stored both the warehouse operators and depositors are likely to make losses.

5.1.1.1 Interviews with smallholder farmers in Kilombero District

The FGD and interviews with smallholder farmers in Kilombero district were conducted in different villages involving both farmers organized in associations and AMCOS under the umbrella of AKIRIGO - the Association of Kilombero High Quality Rice Growers or *Shirikisho la Wakulima wa Mpunga Wenye Ubora wa Hali ya Juu Wilaya ya Kilombero* in Swahili (Table 10) and their counterpart farmers who were not members of farmer groups or associations. Specifically, the FGDs and interviews were conducted with representatives of the Katurukila Farmers Association, Mangu'la 'A' Farmers Association (MAFA), Mbingu Farmers Association and Vijana Mbasa Farmers Group.

Table 10: Farmer groups and associations under the umbrella of AKIRIGO apex

Name of Farmer Group/Association	Ward/Division
Mang'ula A (F/A)	Mang'ula/Mang'ula
Vijana Mbasa (F/G)	Ifakara
Mkasu (F/G)	Kiberege
Katurukila (F/A)	Mkula/Mang'ula
Mbingu (F/A)	Mbingu/Mngeta
Bokera (F/A)	Mang'ula/Mang'ula
Sonzo (F/G)	Mkula/Mang'ula
Kikwawila (F/G)	Ifakara

AKIRIGO was established in 2004 with 20 farmer groups and the number increased to 45 groups by 2015. Initially in 2006/07, the apex included farmer groups from three divisions namely: Ifakara, Mngeta, and Mang'ula and later, in 2015 groups from two more divisions of Mlimba and Kidatu joined the apex. In the implementation of WRS, the AKIRIGO farmers have received support from different NGOs and international organization, including among others RUDI, Norges Vel, NORAD through the ACT/TAP programme, USAID, and the Alliance For a Green Revolution in Africa (AGRA) just to mention few. WRS financing institutions have included the NMB (National Microfinance Bank) and FBME (The Federal Bank of the Middle East). In addition the AKIRIGO farmers were linked to individual buyers, like the JSC Techniques, a company operated by Mr. John Mbatia who financed them in 2008 charging a relatively lower interest rate of 10% than that of formal financing institution which was reported at 18%. The JSC Company purchased rice and sold it in Kilimanjaro region.

In Kilombero District FBME was the first bank to finance WRS in grains in 2007/08. Following sensitization by RUDI, the AKIRIGO farmers were able to deposit more paddy than the value of bank loan. The bank overdraft from FBME was therefore inadequate to cater for the initial payments.[26] NMB was the second WRS financing institution in the district which started

[26] A bank overdraft is a limit on borrowing on a bank current account. With an overdraft the amount of borrowing may vary on a daily basis as opposed to a bank loan which is a fixed amount for a fixed term with regular fixed repayments. The interest on a loan tends to be lower than an overdraft.

financing WRS in grains since 2009 when a loan write up was submitted by AKIRIGO. The AKIRIGO farmers received technical assistance for writing business plan and loan application from RUDI.

According to the personal conversation with the RUDI Officer at Mang'ula (Mr. Ibrahim Mgono), the loan application required the applicants to attach their warehouse licenses, AKIRIGO registration certificates, business licenses, and warehouse insurance.

In 2010/11, members of AKIRIGO deposited a total of 273,335 kg (273 Tons) (valued at TZS 246 per kg) into four warehouses as shown in Table 11. The deposited paddy was finally sold at TZS 413 per kg – making the total value of sale to be TZS 112,819,680. The depositing of paddy for that particular season started on 4th September 2010 and selling commenced on 3rd March and ended on 25th March 2011.

Table 11: Amount of paddy rice deposited by AKIRIGO farmers under WRS in 2010/11

Warehouse	Deposited (kg)
Kikwawila (Mbasa)	18,726
Mang'ula	81,083
Katurukila	54,226
Mbingu	119,300
Total	**273,335**

Source: AKIRAGO Office records

At Katurukila village, the NORAD - ACT/TAP programme in collaboration with the Kilombero District Council, and the Katurukila community has supported the construction of a community warehouse which has a storage capacity of 350 tons (Plate 1).

The Katurukia village warehouse is operated by members of the Katurukila Farmers Association which was established in 2008 with only 56 members, registered in 2009 and officially inaugurated on 18th July 2017. At the time of survey the association was reported to have a total number of 155 members.

The new warehouse at Katurukila village had operated for three seasons with actual storage capacity of 14 tons, 40 tons, and 108 tons respectively by end of 2017. Before construction of the new warehouse (in 2009 – 2010), the association used to store their grains in the village warehouse which has walls and roof made of corrugated iron sheets, a type of warehouse nicknamed as "full suit" warehouse. The old "full suit" warehouse has a storage capacity of 100 tons though initially (at the start of WRS in 2008/09) only 70 tons were stored. RUDI has also supported the Katurukila farmers by linking them to suppliers and sellers of inputs like Mr. Ramadhan Kiumbile.

The old "full suit" warehouse at Katurukila was rehabilitated through the DALDO's office and RUDI supports. RUDI also provided backstopping support, such as following up with warehouse

registration, WRS management training, and facilitation of access to WRS financing as a guarantor. The Katurukila Farmers received its first WRS loan from NMB in 2008/09 worth TZS 50 Million for depositing 70 tons of grains. However, the local market prices for that particular season continued to decline following the export ban imposed by the government for national food security reasons.[27] It was a disastrous and quite discouraging WRS experience for the farmers and facilitators, like RUDI who had to cover some bank repayments worth about 8 million. This has also affected the amount of grain (paddy) deposited at the Katurukila village warehouse in the subsequent years: for example, only 17 and 40 tons were deposited in 2010/11 and 2011/12 respectively.

Plate 1: Katurukila village warehouse in Kilombero district

The Katurukila farmers' association operates both WRS and collective marketing systems. The association is led by Chairperson, Vice chairperson, Secretary and Treasurer. Its new warehouse is operated by a board constituting four people: a warehouse manager and three members. To cater for administrative costs farmers paid TZS 2,000 per bag of 100 kg. While the representatives, leaders and members of the association demonstrated to be competent with

[27] Similar experience was reported by interviewees in other study districts. In Mbozi district for example, producer prices for maize declined to only TZS 5,000 per tin (debe) of about 20 kg in 2016 from the highest of TZS 16,000 – 17,000 per debe in the previous season due to export ban.

quality assessment, such as the use of moisture meter (Plate 2) many were not aware of the exact costs incurred in registering and obtaining a license for their warehouse, as well as the cost of purchasing various warehouse equipment because most of these costs were covered through supports from organizations like RUDI and others. During the interview with representatives of the Katurukila Famers Association, it was only the warehouse manager who was able to provide some estimates (e.g. TZS 2 million and TZS 400,000 in 2009 for moisture meter and weighing balance/scale respectively).

Plate 2: Representatives of Katurukila Farmers' Association in Kilombero district demonstrating the use of moisture meter in rice

The Mang'ula Farmers Association (MAFA) was established in 2007 with 33 members from three farmer groups namely; Jiendeleze, Umoja ni Nguvu and Juhudi na Maarifa under RUDI's facilitation. At the time of interview, MAFA reported to have 150 members operating two warehouses with storage capacities of 3,000 and 2,000 bags of 100 kg respectively and rice milling machine project installed through support by USAID/COMPETE (Plate 3).

Farmers are charged TZS 1,500 per bag of 7 tins (debe) to store their paddy in the MAFA's warehouses, and TZS 40 - 50/kg for rice milling. At the time of interview only 1,778 bags of 100 kg (7 debes) were stored at the MAFA's warehouses versus the total storage capacity of 5,000 bags implying underutilization of the available storage facilities. The members of FGDs at Mang'ula 'A' attributed this to the existing conflicts related to warehouse ownership between MAFA and the village government which has discouraged many depositors to use the warehouses. In addition, the sturdy competition from the private warehouses has also contributed the underutilization.

It is important to note that the MAFA's warehouses do not qualify storage facility under the WRS but they have been used as collection centres. Farmers who deposited their grains in these collection centres had incurred some additional cost of transporting the grains to

qualified warehouses (for MAFA and other farmer groups in Kilombero District the qualified WRS storage facility was located in Ifakara township). MAFA rehabilitated the old "full suit" cooperative godown using members' contribution and financial support from RUDI (for WRS in 2008/09). RUDI also provided training in WRS management to MAFA members via the umbrella of AKIRIGO.

Plate 3: Warehouse and rice milling machine operated by MAFA in Kilombero district

MAFA started to operate the formal WRS in 2008/09 which continued for only two seasons (2008/09 and 2009/10) due to the operational bottlenecks already mentioned in previous paragraphs. In particular, the problems of high transaction costs, including high interest rates and cumbersome bank procedure leading to delays in overdraft and first payment were singled out by participants of FGD at Mangula 'A' as the major bottlenecks that have affected the implementation of WRS introduced in 2007 in the Kilombero District.[28] Often, the depositors have received their first payment very late in September instead of May or June which constrains the chances for them to spend the money in urgent needs, including the need for paying the cost of land preparation and purchasing inputs for the next cropping season. In

[28] Buyers and traders (e.g. in Karatu District) also complained about the cumbersome bank procedures which delay the collection of certificates of pledge and release of warrant from financing institution after finance is made against the commodity.

many cases farmers have also complained about delayed distribution of agricultural inputs (subsidized agro-inputs) and encounter of fake inputs.

The poor performance of WRS was also attributed to the lack of understanding and negative attitude and beliefs in WRS for some farmers. For example, the participants of FGD and KII at Katurukila village in Kilombero District indicated that some farmers, though few, did not deposit their paddy in the community warehouses because they do not want other farmers to know how much grains they produce.

The Mbingu Farmers Association was established in 2003 and registered in 2004 with 105 members. During the survey, the members had declined to a total of only 74. The association used a rehabilitated old community warehouse which was constructed in 1986/87 (with storage capacity of 300 tons) (Plate 4). The warehouse was rehabilitated in 2009 under the RUDI/USAID-COMPETE support by installing gates and windows as well as reinforcing its floor by cement.

Plate 4: A warehouse used by the Mbingu Farmers Association to store paddy in Kilombero district

The Mbingu Farmers Association was among the early group farmers to be involved in the initial WRS under the umbrella of AKIRIGO and facilitation from RUDI. According to the information gathered during FGD and KI interview at Mbingu village, the association operated WRS for only three seasons starting from 2010 to 2013 with depositors paying TZS 1,500 per bag of paddy as storage charge.

As for the other previous interviews, the majority of interviews at Mbingu village were unable to explicitly state the investment and operational costs of WRS – as most of these were covered

by facilitators like RUDI in an attempt to introduce the system.[29] Only few, especially those who happened to be members of the warehouse board were able to recall some costs.

The operation of WRS at Mbigu village has also suffered from conflicts over warehouse use right and ownership between farmers association and village leadership. In 2012, the village government used the warehouse to store grains and other items that were offered as 'food aid' for victims of floods. After then, the association was allowed to use the warehouse till when it was snatched back by the village government leadership in 2015. At the time of interview in December 2017, the warehouse was already rented out to private company (Olam Tanzania Ltd) for storing cocoa. The company has its head office in Dar es Salaam but it operates in different regions in Tanzania. Its subsidiary AVIV was established in 2011 to grow world class Arabica coffee by implementing environmental and social standards.[30]

Interviewees at Mbingu village also ranked the lack of reliable markets as one of the major challenges that influenced the operation of WRS. Mbingu farmers could benefit from local institutional markets, like St. Francis University, Ifakara Health Institute, Government hospitals and schools like the Machipi Secondary Schools but there are challenges: cannot compete with private companies and win the tenders, let alone the problem of delayed payments – institutions have to abide by several procurement procedures before they make the payments which takes time and farmers may find it difficult to wait.

5.1.1.2 Interviews with smallholder farmers in Mbarali District

Interviews in Mbarali District have involved different stakeholders, including the staff of the District Agriculture, Irrigation and Cooperative Office (DAICO) in Rujewa, smallholder farmers, leaders of AMCOS and farmers associations, warehouse operators and buyers of grains. Like in Kilombero District, WRS in Mbarali District has involved the farmers' Apex body namely the Association of Mbeya High Quality Rice Producers Co. Ltd (AMBERICO). The Apex was registered as a company limited by guarantees in 2005 with more than 30 members. In 2008/09, the Apex started to serve as a guarantor for WRS financing through NMB. However, the initial introduction of WRS in paddy has faced several operational challenges in the district mainly springing from financing-related bottlenecks, which discouraged farmers and weakened their Apex (AMBERICO) though it was thereafter revived in 2013 with only 6 active member associations mainly as a guarantor for input loans, collective marketing and farmers' training.

The number of active members increased to 26 farmer associations in 2017 with more than 14,000 farmers (60% being males and 40% females). Through the Apex members are able to

[29] This implies that farmers were not adequately informed of, not only how the system works, but also the costs of operating a WRS and if they could afford operating the system in the absence of donors and supporters/facilitators like RUDI. In general, the introduction of WRS was viewed by many interviewees as adopted more of a 'top-down' rather than 'down-up' agenda.

[30] See: http://olamgroup.com/locations/east-africa/tanzania/

access funds from the bank (NMB). At the time of interviews, the Apex was processing a bank overdraft for the third season after successfully getting overdrafts of TZS 500 million in 2015/16 and TZS 500 million in 2016/17 at an interest rate of 19.5%. Hidden costs were estimated at about 20%. The status of loan reimbursement for the two seasons is shown in Table 12. According to personal discussion with the AMBERICO Secretary, loan repayment by farmer groups and associations was proceeding generally very well, except for the Mbuyuni farmer group which had an outstanding loan of 80 million for Mbuyuni at the time of survey. To the large extent, the outstanding loan was attributed to reduced paddy yields: the 2016/17 season was generally not a good, but dry year for the Mbarali District (paddy yields decreased from 25 - 34 bags per acre in normal years to the average of only 15 and less bags per acre in 2016/17.

Table 12: Status of NMB bank overdraft by AMBERICO members, 2015/16 – 2016/17

Member /scheme	(Million TZS)
Mbuyuni	300
Chosi	75
Matebete	67
Herman	107
Total	**549**

Note that: The smallholder Madibira scheme is not listed here as it gets loan from a different financial institution (CRDB).

To get the loan from NMB, the AMBERICO Apex was required to fulfil the following obligations:

a) Prepare a business plan and cash flow for the Apex – budget/estimates based on the performance in the previous year
b) Submit to the bank the constitution, CV of board members, minutes of the meetings, application letter, and certificate of registration with RITA[31]
c) Identify the potential buyer who should enter in contract with the Apex (Rapha Group was the company who entered into contract with the Apex). The contract should show the margin price versus market price, and the commitment to purchase all the grains as specified in the contract
d) Launch the loan application with the bank
e) After the application is processed the bank informs the Apex whether its application for the bank overdraft is honoured or not. Note that the bank indicates the amount of bank overdraft honoured.
f) The Apex's board members are then required to sign the bank loan agreement together with board members of individual farmer groups or irrigation schemes as the money is deposited into their respective scheme bank accounts. Note that the individual farmer groups or irrigation schemes are required to submit some title deeds, if any or similar

[31] RITA (registration, Insolvency and Trusteeship Agency) or Wakala wa Usajili, Ufilisi na Udhamini was officially launched on 23rd June 2006 to replace the Administrator Generals Department in the Attorney Generals Chambers, Ministry of Justice and Constitutional Affairs. RITA is an Executive Agency under the Attorney Generals in the Ministry of Justice and Constitutional Affairs.

ownership document for few plots and sign the respective transfer forms (*fomu za kuhaulisha mashamba*).

When fund is disbursed and deposited into the Apex bank account, the cost of inputs is deducted and paid to the supplier of inputs who transports and distributes the inputs to the specific farmer groups as required. The balance is then advanced to farmers in three instalments: i) 1st instalment to enable farmers undertake some land preparation and planting activities (about TZS 500,000 per acre); ii) 2nd instalment for weeding (about TZS 150 – 200,000 per acre); and iii) 3rd instalment for the remainder of farm activities, including bird scaring, harvesting and transportation (the remainder of the total loan per acre, that is, TZS 1 million per acre minus the cost of advanced inputs).

In 2016/17 the repayment margin price was pegged at TZS 500 per kg. Farmers who received the loan were to deposit 20 bags of paddy (128 kg each) for an acre as a security for the loan of TZS 1 million per acre. If the 20 bags are valued at the repayment margin price of TZS 500 per bag then the total value of repayment would be equal TZS 1,280,000 (20 bags x 128 kg/bag x TZS 500 per kg). Using the market producer price for paddy (SARO 5 variety) of TZS 970 per kg in 2016/17 the farmer would get gross revenue of TZS 2,483,200 (20 x 128 x 970) and hence net income of TZS 1,483,200 per acre.

The Secretary of the Apex works closely with the Warehouse Clerks. They agree on the dates when the farmers will be depositing their grains and when the buyer wants to remove the grains from the warehouse. Both the Secretary of the Apex and the Warehouse Clerks have separate own padlocks and keys and have to be available during the depositing and removal of commodities from warehouses. They are also responsible for sampling and inspecting the grains before deposited to check for quality. After the grain is deposited the depositor receives a receipt which he/she keeps and presents when the grain is removed from the warehouse by the buyer. The buyer weighs the deposited paddy and makes payment in respective farmer group or scheme bank accounts, from which the money (balance after loan deduction) is then deposited into individual farmer accounts. Once the repayment of bank overdraft is completed the Apex writes a letter of cancellation of the bank overdraft to avoid additional interest charges.

One of the key challenges in implementation of the WRS in Mbarali, as in many other districts in Tanzania, is the lack of registered warehouses. The discussions with representatives of the AMBERICO revealed that only few community warehouses were registered, including the Mbuyuni, Motombaya and Ipatagwa warehouses. The registration process for these warehouses was facilitated by the NMB bank. The idea is to use these facilities in WRS starting from the 2017/18 season. AMBERICO plans to use collateral managers and warehouse operators registered as companies. These will be required to sign a contract with individual farmer groups or irrigation schemes.

The operator will use the warehouse on the rental basis and depositors will pay TZS 2,000 per bag as a storage charge (out of which, the respective farmer groups and schemes will be paid

TZS 500 per bag) and the remaining (TZS 1,500 per bag) will cover the cost of operation (including fumigation, insurance, wages for security guards, and warehouse manager (*Msimamizi wa ghala*).

The study team was also able to visit and conduct interviews with representatives of smallholder farmers at Mbuyuni irrigation scheme. In the past the Mbuyuni warehouse was used by only three villages of Mabadaga, Nyangulu and Mbuyuni. The Mbuyuni farmer group was registered as a Water User Association in 2000 and thereafter as an Irrigators Organization in 2017 (under the National Irrigation Commission).[32] The current number of members is 1,200. About 600 other farmers (non members) rented plots and cultivated crops in the Mbuyuni irrigation scheme for the season 2016/17. The scheme has a total area of 1,500 ha used to cultivate paddy, horticultural crops and maize.

The irrigation scheme has a water permit of abstracting 4,000 cubic meters (abstracting water from 1st November and returning it to the river by 30th May). Farmer paid TZS 7.2 million to the water basin office/board as water use fee in 2016/17 which has recently been increased from 1.2 million they paid in 2014. They irrigate 1,500 ha in the rain season and about 60 ha in the dry season. Productivity has increased from 8 – 12 bags/acre in the past to the 18 – 25 bags per acre (SARO 5).

The study team also visited representatives of the Uturo irrigation scheme which was established in 1985 as a traditional irrigation scheme. An improved intake at the scheme was constructed in 2006/07 and selected farmers trained in irrigation water management at MATI – Igurusi in 2008/09. The scheme is operated by about 3,000 farmers. As of 2016/17 members of the scheme increased to 160 from only 75 in 1985. The Uturo Water User Association got its temporary registration in 2005 before becoming fully or permanently registered in 2008/09.

Average yield at the scheme increased from below 15 bags per acre in the past to 20 – 25 bags per acre in 2016/17 (SARO 5). Farmers of the Uturo irrigation scheme were trained in WRS operation and management in 2011 by RUDI. They started practicing WRS for three years: nothing was deposited in the first year because the association did not receive any bank overdraft. During the second and third year farmers deposited 306 and 1,156 bags of paddy rice respectively. After the training in WRS operation and management, farmers became highly devastated by the good stories they were told about WRS of which they were unable to experience during the three years of engagement in the system.

Before the rehabilitation of the old warehouse by ACT-TAP in 2010 and construction of a new warehouse by the government, under the BRN initiative, farmers of the Uturo Irrigation

[32] The National Irrigation Commission is a body corporate established under the National Irrigation Act No. 5 of 2013.The Commission through its Governing Board is responsible for coordination, promotional and regulatory functions in the development of Irrigation sector in Tanzania. The Act gives National Irrigation Commission a mandate to register all irrigators in the country and to maintain that register, including individual irrigators.

Association used the old warehouse at the village which was constructed in 1970 and operated by the then National Milling Corporation.

The representatives of the Uturo Irrigation Association reported the main buyers for their WRS collective marketing as RAPHA group (who bought paddy in the past but plans to install a rice milling machine at Madibira) and Mtenda (who bought milled rice only). In 2013 another buyer (Susan Rice from Dar es Salaam) bought rice from Uturo village of about 2 – 3 tons. Because of limited numbers of big buyers farmers did not see the difference between the WRS and pre-WRS periods as the buyers continued to exercise more powers in determining the final price of deposited grains.

While still in Mbarali District, the study team visited another warehouse at Mahongole village which is used by smallholder farmers from six villages (i.e. Ilaji, Ilongo, Igalako, Mahongole, Mapogolo and Mhwela) who cultivate at the Ipatagwa irrigation scheme. The scheme commenced as a traditional irrigation scheme locally called "*skimu ya wazawa*" which was started by their fathers and grandfathers. The same was upgraded into an improved irrigation scheme in 1997 and an irrigators association with 350 founder members was established. At the time of interview the number of members had increased to about 900 farmers. The Ipatagwa scheme gets its water from the Mlowo (through the Motombaya irrigation scheme) and Ipatagwa Rivers.

The size of land under irrigation in the scheme is 540 ha developed in two phases: 250 ha during Phase I and 290 ha in phase II. The Phase I (for Ilongo and Ilaji villages) project was implemented by an Indian company; and Phase II (for Mahongole and Mhwela villages or collectively called "*Tambukaleli*") was implemented by a Chinese company.

Farmers at Ipatagwa irrigation scheme engaged in formal WRS operation for only one year (2006/07) using the Mahongole warehouse as a collection centre before transporting their grains for storage at the Chimala SACCOS warehouse. The association was financed by PRIDE under facilitation from AMBERICO/DAI-PESA. Because of distance and WRS operational challenges, as discussed in the previous cases, the association could only transport 440 bags to the Chimala warehouse. The outcome was quite discouraging for farmers as they sold their paddy at loss (TZS 330/kg versus the indicative price of 800/kg). In addition, the warehouse was unable to store the entire paddy which was transported to the Chimala warehouse resulting into subsequent losses in quantity and quality of the grain, as some bags were packed outside the warehouse.

In general, the changes in producer prices for grains over the season have been difficult to predict. This problem has been not unique to only paddy, maize and other grains but also common in many other agro-commodities. Discussions with various staff of NMB indicated that in 2010/11, the indicative price of cashew, as announced by the Cashewnut Board of Tanzania

(CBT)[33] was TZS 1,000 per kg but the price continued to decline further over the season to levels which were far below the indicative and conservative prices of TZS 1,000 and 700 per kg, respectively.[34] In some cases, the warehouse operators face the challenge of outstanding stocks or having last season's unsold commodities carried forward to the next season.

5.1.1.3 Interviews with smallholder farmers in Mbozi District

In Mbozi district the implementation of WRS was facilitated by the Technoserve through the SAPPHIRE (Storage and Proper Post-Harvest Improvements for Resource Efficiency) programme, funded by AGRA and UKaid/DFID. Technoserve worked with eight farmer groups in Mbozi district with one of these being the Msamba 1 AMCOS, Msamba village in Kilimapimbi ward in Vwawa Division). The warehouse at Msamba 1 village (Plate 5) was built in 1978 for storage of coffee by farmers of the Mbozi Cooperative Union (MBOCU).[35] The warehouse was rehabilitated in August, 2009 - 2010 as part of the ACT/TAP activities in the district. In addition, ACT/TAP also supported the AMCOS with a weighing balance/scale - which was stolen in September 2014. As a replacement, Technoserve facilitated the purchase of another weighing scale/balance for the warehouse.

Plate 5: A warehouse operated by Msamba 1 AMCOS in Mbozi district

WRS at Msamba 1 was practiced in 2011 after the establishment of the AMCO starting with 60 members and then went up to 255 members (with temporary registration) before dropping

[33] The Cashewnut Board of Tanzania (CBT) is a corporate body established by the Act No. 18 of 2009. It is entrusted with the responsibility of regulating the development of the Cashew Industry in Tanzania.

[34] Note that, NMB pegged its conservative prices for cashew in store at 70% of the indicative price.

[35] MBOCU is one of the smaller unions in Mbozi district in the southern highlands, which together with the Isansa and Iyula Cooperative Union (ISAYULA), were able to grow from the defunct regional union, the Mbeya Co-operative Union (MBECU).

down to only 91 by December 2017. The WRS involved two grains (maize and rice) though did not work well. In 2011 about 2 tons of rice were deposited in the warehouse and sold in-store to buyers from Ileje (Mbembe village) who sold it to Tunduma. In 2012, about 2 tons of rice and 1 ton of maize were deposited in the warehouse but the market was not reliable – rice was sold in-store to different buyers at low prices and maize was sold to NFRA (*Wakala wa Taifa wa Hifadhi ya Chakula*) at the Agency's storage facility in Vwawa, Mbozi district (Plate 6).

Plate 6: NFRA's storage facility in Vwawa, Mbozi district in the southern highlands

After a consequential failure to access reliable market for their grains, most members of the Msamba 1 AMCOS became discouraged and did not deposit any grain in 2013, except in 2014 and 2015 when the farmers deposited 243,271 kg and 100 tons of maize which were sold to NFRA at TZS 530 and TZS 530 per kg respectively. According to the FGD at Msamba 1 village, farmers have benefited from a revolving fund for inputs which was operated by ARI-Uyole in 2014. This enabled farmers to access input loans in advance and repay them after harvesting at an interest rate of 20%. However, the selling prices for maize were too low to cover the production costs. Transportation constituted another handicap as there was a delay in transporting the grain from the warehouse (which is located in a remote area) to the NFRI storage facility in 2015. Since farmers were required by NFRI to sell maize which is not treated by any storage chemicals, the delays in transportation (the maize harvested and deposited in 2014 remained in the warehouse at Msamba 1 till February 2015) which lead to grain damage by storage pests, especially insects, like grain borer, and hence additional loss on the side of depositors. Consequently, farmers became discouraged and did not deposit any grain in 2016 and 2017. Farmers also complained of mismatch or decline in weight of their deposited grains compared to the weights given/recorded by the NFRI staff and delayed payments. On average, farmers reported a difference (loss) of about 2 kg per bag and they were paid lately in May 2015 instead of December 2014.

Participants of FGD at Msamba 1 discussed issues of export bans and the requirement of exporting value added products versus unprocessed grains but they need to be enabled to own the processing plants. Dependency on mills operated by private companied will never make a

difference for smallholder farmers! In some areas, very few maize processing mills exist (e.g. the Unyiha (Wiza Sembe) at Mlowo and Shiwanda at Chimburila in Mbozi District.

Maize from Zambia also competes with maize produced in Mbozi. According to the interview with representatives of farmers at Msamba 1 village, the price for maize imported from Zambia was relatively lower than that of locally produced maize. Very often, traders purchased maize from Zambia and transported to as far as Mwanza and other areas for sale. There normally seasonal and annual variation in the prices of maize (e.g. by end of December 2017 the price was TZS 5,000 per debe of 18 kg whereas by the same time, the price ranged from TZS 11,000 - 12,000 per tin (debe) in 2016. The highest price was TZS 18,000 per debe in April 2017.

Overall, the SAPPHIRE programme has worked to capitalize on the potential of maize to increase incomes for farmers through increasing productivity and improved aggregation in Mbeya, Songwe and Ruvuma regions. Technoserve has conducted training on improved agronomic and post-harvest practices and also supported agricultural marketing cooperative societies in credit applications and contracts with an input distributor to help provide farmers with access to improved inputs. It has also worked with these same agricultural marketing cooperative societies to improve their capacity to market maize whilst navigating with the complex maize marketing environment.

Interviews with the staff of DAICO in Mbozi indicated that the history of cooperatives in Tanzania has also affected the performance of WRS, especially among the smallholder farmers. Cooperatives in Tanzania have a long history, dating back to the late 1920s, but more recently their image has become a negative one. For many people in Tanzania, coops are seen as stuck in the past, unable to cope with modern economic realities. Far from being models of member self-empowerment, their image is tarnished by poor administration and leadership, poor business practice, and by corruption.

The applicability of WRS in the traditional food crops (e.g. rice, maize and other grains) is also challenging compared to cash crops (e.g. coffee, cashew nuts etc) requiring the smallholder farmers to store and wait for good money at right time. In addition, the traditional food crops lack independent crop boards as compared to traditional crops like coffee where the commodity outlet is largely through the board making it easier for the bank to channel the loans through the boards. The willingness of financial institutions to lend farmer groups operating WRS in traditional food crops was mentioned as one of the key challenges. According to the interviews with representatives of AMCOS in Mbozi District, for example, the existing financial institutions in the district were readily/willing to finance WRS for coffee rather than maize and common beans.

The National Food Reserve Agency (NFRA) has operated as a major buyer of maize in Mbozi District, but the buying prices were reported by interviewed smallholder farmers as lower than that offered by private traders who export maize to neighbouring countries. NFRA also faces stiff competition from middlemen who buy maize early during the harvesting season (June –

July) at low prices, store and sell it at high prices in September – October. Maize is normally sold at the highest price in April.

In few cases however, interviewees have reported high producer prices (e.g. in 2016/17 where maize farmers, especially those organized in groups like AMCOS, were paid a producer price of TZS 500 - 530 per kg).[36] The producer prices for maize in 2016/17 were higher than those in the previous three seasons. NFRA also provided support in terms of sacks or bags of 90 kg and weighing balance/scale, but the interviewed farmers Mbozi District complained about delayed payments in some seasons, especially in the 2013/14 and 2014/15. In 2016/17 payments by NFRA were done timely (within three days after selling of maize) and the LGA levies were paid within one and half a month. According to the interviews with the staff of Mbozi District Council, the district charged levies of 3% for maize, and 5% for coffee (which has recently been reduced to 3%).

Input availability was also reported by smallholder farmers in Mbozi District as another challenge especially for remotely located villages like Msamba 1. Agrochemical dealers are not interested in supplying agro inputs in remote areas despite the differences in indicative prices at regional, district and village levels. For example, at the time of survey, the indicative prices for per bag of UREA (50 kg) were TZS 39,921 and TZS 41,400 at the district and village levels.

The AMCOS at Msamba 1 village has been engaging in WRS initially for maize and paddy and latter for maize only because paddy was not a common crop in the area. Paddy used to be produced in a nearby irrigation scheme known as Sasenga (with 580 acres) which produced SARO and a local variety known as *India Rangi*. At the time of survey, only about one quarter of the area) was used to grow paddy because of limited water flow from the intake caused by siltation. According to the discussion with District Irrigation SMS, the intake, which abstracts water from River Nantesya, has been damaged and requires refurbishing with costs of rehabilitation estimated at about TZS 30 million.

The study team had opportunity to visit the warehouse operated by the Upendo Group (Senjele) AMCOS in Mbozi district (Plate 7). This storage facility is used by six villages in Nanyala ward (i.e. Senjele, Nanyala, Songwe/Mlangali, Lusungo, Namlonga, and Luanda/Idibira). The warehouse was rehabilitated by ACT/TAP in 2011. The Upendo Group (Senjele) AMCOS was established in 2012 with 25 members (134 males and 12 females), and registered (temporary)[37] in 2016. Members of the AMCOS were trained in good agricultural practices and WRS management by the SAPPHIRE programme.

In 2012 the farmers deposited 4 tons of maize sold at the price of TZS 630 per kg to NFRA as the main buyer. In 2012/13 farmers deposited 50 tons (above the warehouse capacity, some maize

[36] According to DAICO, Mbozi district had 80 AMCOS and 10 SACCOS by the end of 2017.

[37] The representatives of members of the Upendo Senjele reported to spend about TZS 500,000 for temporary registration (including the annual registration fee of TZS 40,000) with District Cooperative Officer

was stored outside) and sold the crop at TZS 520 per kg – which, according to the interview with representative of the AMCOS, was lower than the price initially agreed between NFRA management and the AMCOS.

Plate 7: Warehouse operated by the Upendo Group (Senjele) AMCOS in Mbozi district

In 2013/14 the number of members of the Upendo Group (Senjele) AMCOS increased to 150 but farmers deposited only 30 tons because of delays: the agreement was signed in June but payments by NFRA were delayed due to lack of sisal bags and pallets at the Mbozi NFRA's warehouses. In 2013/14, farmers were paid TZS 4760 per kg and TZS 440 per kg (after deductions) for AMCOS members and non-members respectively. The unreliability in price and volume of maize demanded by NFRA were said to have contributed to discourage many potential farmers to become full members of the AMCOS. At the time of survey the Upendo Group (Sanjele) AMCOS was led by a board of 7 people (including the Chairperson, Deputy Chairperson, Secretary and other representatives farmers).

For beans the main buyer in Mbozi District was Rapha Group. Beans are harvested in April – May and by end of May farmers communicate with the buyer. Farmers started to deposit beans in 2013/14. In 2015/16 and 2016/17; 29 and 34 tons of beans were deposited by farmers. For the past four seasons (2013/14 – 2016/17 farmers sold their beans at TZS 1,100; 1,150; 2015/16 1,150; and 1,180 per kg respectively.

Interviews with DAICO staff in Mbozi also showed that the districts has been benefiting tremendously from maize demand in neighbouring countries. For example, in 2013/14 there was high demand for maize in the Kenyan market, maize from Mbozi was exported to Kenya and farmers received better prices for their maize. When there is an export ban in food grains the income of farmers is highly affected as they are forced to sell their grains at very low prices.

Plate 8 shows a warehouse operated by the HASAMBO AMCOS Ltd with registration number MBR 287. The cooperative has its first priority in Arabica coffee though when opportunities exist the warehouse is used to store maize for collective marketing, e.g. through the NFRA as a

buyer. Arabica coffee is a traditional cash crop in Mbozi district grown since independence and HASAMBO has a direct sales contract with Taylor Winch Limited, a multinational coffee buying company.[38] At the time of the survey, the AMCOS was reported to have 248 members. Both members and non-members of AMCOS sell their coffee through the HASAMBO AMCOS Ltd.

Personal conversation with the Secretary of HASAMBO AMCOS Ltd indicated that in addition to the problem lack of reliable buyers, the initial WRS did not take off well partly because farmers were not well informed about concept of WRS.

Plate 8: Warehouse operated by the HASAMBO AMCOS LTD in Mbozi district

Plate 9 shows a warehouse operated by the Isangu village in Hasanga ward in Mbozi district. According to the village chairperson, the warehouse was constructed in 1983 through the GTZ financial support for storing coffee and other grains (especially maize and beans). The warehouse has been recently rehabilitated (in May 2016) using financial support from the Ministry of Agriculture Livestock and Fisheries. The warehouse is currently used for storing cereals only and conducting meetings when idle. The warehouse is no longer storing coffee since 2005 following massive coffee rot and decline in price from TZS 1,500 per kg (before the mid 1990s) to TZS 300 per kg (from the mid 1990s to early 2000s). The village plans to register as an AMCOS. Currently, the Shalomi Coffee Group collects coffee processed at home (coffee in parchment)[39] and sells it via the Moshi market through the coffee board.

[38] Taylor Winch (Tanzania) Limited operates as a subsidiary of Volcafe Holding Ltd.

[39] The coffee or 'green bean' lies within the fruit and is surrounded by the parchment membrane, pulp or mucilage and outer skin. Coffee beans must be dried before the parchment can be removed and beans roasted.

Bean production has gone down especially due to pests and maize has therefore remained the only grain which most farmers would wish to store it in the warehouse.

Plate 9: A village warehouse at Isangu in Mbozi district

5.1.1.4 Interviews with smallholder farmers in Morogoro Rural District

Morogoro District has received various supports from different donor programmes and projects including FAO, which supported the construction of several warehouses in 1980s; ACT/TAP which supported the rehabilitation of the Magogoni warehouse in 2009/10; and the District Agriculture Development Programs (DADPs) which funder the construction of warehouses in 2011/2012.

The district has also benefitted from the Global Agriculture and Food Security Program (GAFSP) funded project namely Expanding Rice Production Project (ERPP).[40] ERPP is implemented in Kilombero, Kilosa, Mvomero and Morogoro Districts of Morogoro Region in Tanzania Mainland and Pemba and Unguja Islands in Zanzibar. The development objective of the project is to increase rice produced and marketed in the Morogoro Region in the Tanzania Mainland and in Zanzibar, leading to improved rural incomes and food security. The project has four main components: (i) Sustainable seed systems; (ii) Improving crop productivity through better irrigation and crop management; (iii) Innovative marketing strategies; and (iv) Project management, monitoring and evaluation.

The FAO established warehouses were initially meant to store cash crops such as cotton. Latter on the lack of warehouse for grains and decrease in cotton production necessitated that use of

[40] ERPP runs from 2012 to April 2020

these facilities to store grains. According to office records at the District Agriculture, Irrigation and Cooperative Office (DALDO) in Morogoro Rural District, the key grains produced in the district include maize, paddy, sorghum, and pigeon peas. Production of grains has been increasing over years but suitable storage facilities are lacking. The few available warehouses also miss some of the necessary facilities and equipments such as fire extinguishers, weighing balance, cleaning machines, moisture meter, fumigations kit, and pallets just to mention few. Morogoro District has received various agricultural supports from different donor programmes and projects including FAO, which supported the construction of several warehouses in 1980s; ACT/TAP which supported the rehabilitation of the Magogoni warehouse in 2009/10; and the District Agriculture Development Programs (DADPs) which funder the construction of warehouses in 2011/2012.

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Interview with participants of FGD at Milengwelengwe village in Morogoro Rural District indicated that depositors used a warehouse owned by a farmer group. The warehouse is managed by a committee constituting the chairperson, secretary, treasurer, and four members and has a storage capacity of 130 tons. The warehouse is located in such a way that it is easily accessed by most farmers when wish to deposit their crops. However, farmers with farms located in distant areas where the road infrastructure is poor had experienced difficulties in moving their crops from the farm to the warehouse. The roads are generally hardly passable during the rainy season making the aggregation of grains from such area to be quite challenging.

[41] ERPP runs from 2012 to April 2020

Mikese village in Morogoro Rural District had three warehouse namely Mtego wa Simba, New land and Fulwe. The study team visited and held discussion with key informants and members of the Mtego wa Simba warehouse committee. According to the interview conducted with committee members, the Mtego wa Simba warehouse was establish in 2000 by group members facilitated by the Women Organization for Poverty Alleviation in Tanzania (WOPATA). The warehouse is one of the storage facilities rehabilitated by ACT/TAP in 2015. The warehouse is managed by a committee constituting a chairperson, secretary, treasurer, warehouse manager and four members.

The study team also visited another warehouse at Kiroka village in Morogoro Rural which was established by the MKIMAKI (Mtandao/Umoja wa Kikundi cha Mashine Kiroka) Group in 2016 (Plate 10).

Plate 10: The Kiroka village warehouse established by MKIMAKI Group in 2016

As for other study district, many farmers were also not familiar with WRS though few, especially those who were members of farmer groups attended training facilitated by ACT/TAP in 2008

and 2013. Producer prices have been highly fluctuating and unpredictable making it difficult for farmers to determine the right time to sell their grains.

The interviewed farmers in the district, were also not aware of CPB (*Bodi ya Nafaka na Mazao Mchanganyiko Tanzania*) which could help them in the operation of WRS by setting the main backbone of the marketing systems and its channels for deposited crops, give no objection to the implementation of WRS, ascertain the compliance of Warehouse Operators on quality of crops certification, verify quality to buyers, and arbitrate disputes between buyers and sells. The farmers were also not aware of the existence of the Rice Council of Tanzania (RCT) which represents different private stakeholders in the value chain of rice in Tanzania, which include paddy farmers, processors, traders, researchers, seed producers, importers and suppliers of inputs, service producers, financial institutions like the banks engaged in financing the rice subsector and NGOs. Many farmers in the district sell their crops on individual basis, very few aggregate and sell their crops under collective marketing.

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5.1.1.5 Interviews with smallholder farmers in Karatu District

The major crops grown in the villages which were visited by the study team in Karatu District were maize, pigeon pea, common beans, wheat and barley. According to the interview with DAICO staff the total production for all food crops in 2016/17 was estimated at 90,729.

The FGD participants at Rhotia ya Kati village in Karatu District reported that most farmers in the village intercrop maize with pigeon pea and common beans with average productivity of 12 bags of 120 kg (maize), 1.2 bags of 100 kg (pigeon pea) and 20 kg of common beans per acre. The village had two warehouses: one owned by the village government (Plate 11) and another

one by the Roman Catholic Church. The village warehouse was constructed by FAO in 1984/85 with storage capacity of 3000 bags while the Roman Catholic Church's warehouse was constructed in 1978 with storage capacity of 1500 bags. Both are operated at full storage capacity. The village warehouse is managed by a chairperson, secretary, treasurer, and 24 members of committee. During the FGD at Rhotia Kati village, some participants indicated to have attended a seminar on WRS which was facilitated by ACT/TAP but they have not yet used the knowledge in a formal WRS. In general, most of interviewed smallholder farmers in Karatu District were not aware of the WRS as the system was not well established in the district.

Plate 11: Rhotia Kati village warehouse in Karatu district

In Karatu District, the Diragw AMCOS in Mbulumbulu ward is one of the well organized farmer groups and coops. Its organization structure constitutes a Chairperson, Secretary, Treasurer, Warehouse Operators and four Committee/Board members. The functions of the board are:

a) To oversee all the operation of warehouse, including quality inspection for commodities brought for storage
b) To oversee all matters related to the AMCO's finance, including the preparation of income and expenditure reports
c) To prepare a team and annual report for the assembly committee.
d) To seek the buyers of commodities stored in warehouse.

Interview with representatives of the Diragw AMCOS at Kambi ya Simba village indicated that about 200 tons of maize; 100 tons of pigeon peas; 300 tons of common beans, and 500 tons of barley were stored in 2015/16. Beans were stored in June and July; wheat and barley in August and September; and maize from September to October. The storage cost was TZS 2,500 per bag, for all crops. The warehouses are utilized by both smallholder farmers and traders. The warehouse at Kambi ya Simba (Plate 12) was built in 1985 under support from FAO and rehabilitated by ACT/TAP in 2011/12.

Plate 12: Kambi ya Simba village warehouse in Karatu district

Though unacquainted, the smallholder farmers in Karatu District had in practice participated in some form of WRS and collective marketing, especially for pigeon pea using rented warehouses facilitated by the Kilimo Markets Ltd Company. The Kilimo Markets Ltd Market Brokerage Service is private company registered in 2010 and licensed as a warehouse operator to manage grain as collateral as well as broker contracts with smallholder farmers in Northern Tanzania.[42]

The Kilimo Markets Ltd operated in the country's WRS in partnership with a national bank (e.g. NMB) as financier, capitalizing the value chains and Farmer Marketing Associations (FMAs) as depositors of grains. The market brokerage services complement the other agribusiness services provided by the company to enhance grain productivity and use of quality inputs. The company provides access to market to smallholder farmers working in partnerships with FMAs, tailor-made finance solutions in partnership with leading financial institutions in Tanzania.

[42] See: https://www.kilimomarkets.com/attorneys

In 2015/16, Kilimo Markets Ltd purchased a total of 1,634,491 kg of pigeon pea and common beans. Interviews with the management of the company indicated that it has managed to purchase a maximum of 3000 – 4000 tons of pigeon peas per annum. The company paid TZS 200,000 per month as storage charge, normally for 3 – 4 months in a year. However, the storage period in some years (e.g. 2015/16), would extend to as long as 13 months due to unfavourable market conditions. They collect the grain from villages like Qaru and Endabashi in Karatu and export it mainly to India.

NFRA is another buyer of grains in the district. The agency is well known by many farmers and purchased maize directly from farmers. In 2016, NFRA purchased maize at TZS 500 per kg, which was relatively far below the producer price which was offered by private traders (i.e. TZS 600 per kg). NFRA also did not own any warehouse for storing grains in Karatu District. It is important to note that smallholder farmers and other stakeholders in different areas have viewed the decision of NFRA to offer low producer prices and the government impose export bans in grains as translating into smallholder farmers explicitly subsidizing food security for other consumers in the country.

Smallholder farmers in Karatu have also received support from different stakeholders including the Quality Food Product Ltd (QFP),[43] which assisted in delivering improved bean seeds, Tanzania Breweries Limited (TBL), which entered into contract farming with barley farmers and provided seeds, fertilizer, pesticides and loans.

Interviews in Karatu District noted some success stories in WRS operation to include that of the Kilimanjaro Native Cooperation Union (KNCU), Rift Valley Cooperation Union (RIVACU), and Arusha Cooperation Union (ACU). WRS in cashew was cited as doing better because it has helped farmers in Lindi and Mtwara regions to sell their cashew at higher producer price (TZS 4,000 per kg) than TZS 500 per kg which they used to get in the past.

The Cereals and Other Produce Board of Tanzania (CPB) or *Bodi ya Nafaka na Mazao Mchanganyiko* Tanzania, is not known by many stakeholders of the cereal and legume subsectors. Crop boards, like CPM, are required by the law to a) set the main backbone of the marketing systems and its channels for specific crops; b) Give no objection to the implementation of WRS; c) Ascertain the compliance of the Warehouse Operators on quality of crops certification; d) Verify quality to buyer; and e) Arbitrate in case of dispute between buyer and seller.

[43] QFP is a farming services, crop processing, and marketing company based in Arusha which started its operations in 2002. QFP is involved in contracting, financing, and servicing farmers around Arusha to enable mechanized crop production. It purchases crops from contracted farmers, processes the crops and exports final products to Kenya, Europe and China. Currently, the company deals with maize, dry beans, sunflower, and safflower.

5.1.2 Perceptions of other stakeholders

The perceptions of other stakeholders, such as employees of the Local Government Authorities (LGAs), warehouse operators, transporters, support NGOs like RUDI, guarantors, buyers and other stakeholders reflected the perceptions of smallholder farmers. For example, interviews with staff of the Kilombero District Council in Ifakara indicated that the operational costs of WRS were too high and prohibitive for smallholder farmers to afford. Many smallholder groups, like AMCOS and farmers' associations, lack the financial resources to own and operate their own storage facilities. Through different projects and programmes, the central government and LGAs as well as NGOs have supported the construction and rehabilitation of some public or community warehouses but the rights and duties of owners and users are not clearly spelled out leading to conflicts between farmer groups (the users) and owners (village/political leaders).

Besides the costs related to WRS financing, depositors also incur a wide range of costs including the costs of transporting their crops from the farm to the warehouse, storage costs, payment of warehouse operator's lien, levies and taxes and other charges which are approved by WRRB. The system involved high transaction costs, including wages for security guards. The high operational costs imply a denial of smallholder farmers to benefit from WRS in cereals and legumes. Where piloted, the huge component of operational costs is covered by supporters.

Non-farmer stakeholders also underscored the problem of unreliable markets and price volatility. Interviews with staff of the Kilombero District Agriculture, Irrigation and Cooperative Office indicated that producer prices are normally the lowest during harvesting time, especially in July and August but they increase substantially in December to January. In 2016/17 however, the producer prices for paddy in Mbarali district have increased from TZS 850/kg (for SARO 5) and TZS 1,000/kg for local varieties to the highest of TZS 970 and 1,075 - 1,100 per kg respectively.

In general, significant changes have occurred in certain years (e.g. 2007) with producer prices continuing to decline in December and January instead of increasing due to several factors including the lack of reliable markets, export bans and lack of an efficient marketing information system. This has disappointed farmers to effectively engage in a profitable WRS.

To address the problem of marketing information asymmetry, RUDI is currently promoting the use the East Africa Grain Council (EGC) G-SOKO platform (*Soko la Kimtandao*) through the Food Trade Project. This helps farmers to sell their grains at higher prices: the price of paddy in Kilombero district for the week ending on 24th December 2017 was TZS 915 per kg compared to prices of lower than TZS 800 per kg at the local market. However, evidence gathered from the interviews with smallholder farmers in Mbarali District suggests that, the prices offered at the regional market through the G-Soko are sometimes lower than the existing producer prices at local markets (cf. TZS 1,000 per kg at the regional market versus TZS 1,075 per in kg at the local market by end of December 2017).

The pilot WRS in cereals and legumes has suffered from unsustainable support from both the government and NGOs as this has mainly been in form of short term projects and programme. Often, when the project and programme which supported the operation of the system ends the same system is also bound to collapse.

In Kilombero, Mbarali and Mbozi districts, farmer groups and associations are also encouraged to solicit capital from other sources, including own funding through crop contributions. In Kilombero district, for example, members of the Vijana Mbasa Farmer Group have already started to contribute and have purchased a plot for constructing their own warehouse facility. The group was formed in 1995 and registered in July 1997. The group has also benefited enormously from good WRS practices they have learnt from field exchange visits in various areas, including the visits in Usangu plains; and in Malawi where farmers have even adopted the Kilombero rice variety.

Transparency and trust between members and management of farmer groups and association are crucial for effective operation of a WRS. The performance has been impressive where members of the groups or associations are regularly updated about the status of their cash flows (revenue and expenditure).

Many stakeholders also pointed out that WRRB as the key regulator of WRS, lacks both the human and financial resources to effectively conduct its full range of regulatory activities. Currently, the board is staffed with only 11 permanent employees and 2 drivers employed on a contract basis. In addition, the location of WRRB's office in Dar es Salaam adds costs to WRS operators as they apply for registration and licenses. Since cereals and legumes are produced in several areas in the country the interviewees recommended that the Board be helped to establish some sub-offices at least at the zonal level). This will simplify the process of registration and licensing for WRS operators.

Stakeholders also underscored the need for WRS operation to be linked to, and complemented with other related initiatives like the Marketing Infrastructure, Value Addition and Rural Finance Support Programme (MIVARF).[44] The principal objective of the national-wide MIVARF programme has been to reduce rural poverty and accelerate economic growth on a sustainable basis through enhanced rural incomes and food security. The specific objective of the ADF component was to enhance rural incomes and food security through improved market access (feeder roads, market centres and storage, community management of infrastructure), increased share of value added of small- and medium-scale producers and processors including training and matching grants for equipment.

[44] MIVARF was a follow-up to the Bank and IFAD financed Agricultural Marketing Systems Development Programme (AMSDP). MIVARF, a 7 year (2011-2017) support programme which focused on improving access to financial and market services for the rural, economically active, poor (the beneficiaries) while emphasizing on financial and commercial viability and sustainability. The programme was implemented by the Government of the United Republic of Tanzania in collaboration with the International Fund for Agriculture Development (IFAD) and the African Development Bank (AfDB)

Some stakeholders attributed the poor performance of WRS for grains like cereals and pulses to the lack of specific crop boards and entity that would set some indicative prices like for cotton, cashew nut, coffee and other traditional cash crops. Of recent however, the Rice Council of Tanzania Ltd (RCT) has been established as an apex body representing private sector rice stakeholders (farmers, input suppliers, processors, traders, other service providers, financiers, researchers, consumer organizations and NGOs) in Tanzania.

RCT was registered in June 2014 to spearhead, coordinate and lobby activities of the rice industry in Tanzania. RCT evolved from the Tanzanian Rice Partnership (TARIPA) which was established in 2011, soon after the launch of the SAGCOT as a first step in the development of the national rice value chain. Initially TAPIRA focused on developing the Kilombero Rice Cluster, followed by the Dakawa Cluster (in Mvomero District) and Mbarali Cluster. TARIPA was dropped to avoid confusion of roles, functions and legitimacy and focus on the development of RCT and its original mandate become conceptualized within the operational plan of RCT. However, the majority of interviewed farmers were not aware of RCT with exception of the FGD participants at Mbingu village in Kilombero district, who indicate to be informed of the existence of RCT and reported to have a representative of RCT from their village.

Discussion with staff of Rural Urban Development Initiative (RUDI) at Mang'ula, Mr. Ibrahim Mghonu, who was also coordinating COMRICE project (commercial rice project – Norges Vel) and Food Trade Project (Farm Africa) indicated that the initiative has participate immensely in supporting operation of WRS in Tanzania, especially in Kilombero and Mbarali Districts. RUDI is a private sector development organization based in Dar es Salaam and one of the local NGOs dealing with empowering micro-small enterprises (MSE) and farming communities through improved market linkage and distribution channel for their products. The activities of RUDI are targeted to building strategic partnership and strong business associations especially within farming communities that can formulate and advocate policy reform measures, improve market linkage through information sharing, facilitate access to credit, and expand crop/product production through business skills management training.

Other projects that RUDI has implemented include the BRITA (Building Rural Enterprises Through Associations; SHOP (Smallholder Horticulture Outgrower Promotion), Staples Value Chain – NAFAKA under the US Government's Feed the Future (FtF) initiative, and MAIL (Market Access for Increased Incomes and Improved Livelihoods) for Farmers of Southern Highland Districts of Tanzania.

BRITA was a follow up project after the end of PESA (Private Enterprise Support Activities) which was funded by USAID and implemented by Development Alternative Inc (DAI) for five years (October 2002 – September 2007). DAI-PESA managed to support the formation of 189 associations out of which 168 were producer associations and 12 were trader/processor associations. BRITA was implemented in three phases ending in 2009, 2012 and December 2015 respectively. The project supported 10 apexes in six regions (year 1) and reduced its support to only 3 regions in the second year. It also promoted WRS as one of the project outputs.

SHOP was a two year project which started in October 2007 under USAID support. The project concentrated its activities in the northern highlands of Arusha and Tanga regions implemented in collaboration with ACD/VOCA, which is an American agribusiness development organization and other stakeholders, including exporters of horticultural products. The objective of the project was to build the capacity of smallholder farmers in these areas to integrate into profitable export markets for high-value vegetable (HVV) products. The role of RUDI in this project was to build capacity of farmer associations in business practices, leadership and accountability.

RUDI also served as one of the subcontractors who implemented the NAFAKA Staples Value Chain Activity, which is a six-year Task Order issued by the United States Agency for International Development (USAID) under the Tanzania Feed the Future (FtF) Initiative and administered by ACDI/VOCA.

NAFAKA integrates agricultural, business, gender, environmental, and nutritional development efforts to improve smallholder farmer productivity and profitability within the rice and maize value chains in Morogoro (Kilombero and Mvomero districts), Dodoma (Kongwa district), Manyara (Kiteto district), Mbeya (Mbozi, Mbeya Rural, Mbarali, and Rungwe districts), and Iringa (Iringa Rural and Kilolo districts) on the mainland, as well as Pemba and Unguja in Zanzibar.

RUDI has conducted farmers training in good agricultural practices, like SRI which has resulted into significant increase in rice yields from average yield of 3.6 bags per acre to 25 – 30 bags per acre. Farmers who have adopted SRI get up 37 – 48 bags per acre using improved varieties, like SARO *nyekundu* (TXD 307) and SARO TXD 306.

The goal of the FtF initiative is to sustainably reduce global poverty and hunger. Specifically the initiative works to a) increase agriculture productivity; b) maintain the natural resource base and promote adaptation to climate change; c) stimulate the private sector; d) increase trade; e) support policy reforms and good governance; f) ensure underserved groups benefit from growth; and g) expand knowledge and training by supporting research and development.

In Kilombero District, NAFAKA is engaged in developing associations and increasing productivity in 56 villages (20 in Ifakara North, 16 in Mlimba, and 20 in Mang'ula), focusing mainly on rainfed production.[45] NAFAKA also continues to facilitate KPL outgrower schemes in 10 villages. In Mbarali and Mbozi Districts, NAFAKA works with over 11,178 paddy rice farmers in more than 60 villages in Mbarali.

MAIL was a three years project which commenced on 1st August 2012 and ended on 31st July 2015. The project was funded by the Alliance For a Green Revolution in Africa (AGRA) and

[45] See http://pdf.usaid.gov/pdf_docs/PA00MBQM.pdf

sought to enhance farmers' access to markets thereby providing an opportunity for low capacity to sustain an effective marketing system, helping farmers reduce post-harvest losses by demonstrating the benefits of using WRS/Collective Marketing. RUDI participated in the implementation of MAIL with its motto of "*Maghala Kwanza*" or "Warehouses First."

The RUDI staff at Mang'ula office also indicated price volatility as one of the factors that has discouraged farmers to effectively engage in WRS. In 2010 for example, the producer prices for paddy successively declined from TZS 580 per kg to TZS 500 and to the lowest of TZS 333 per kg which was extremely lower than the indicative price used in the application of bank overdraft facility.

Two avoid burglary; the arrangement was for each warehouse to have three padlocks – two for members (manager and member) and one for RUDI. RUDI has served both as a facilitator and a guarantor for the bank overdraft for the AKIRIGO Apex body in Kilombero District and has also participated in verifying the deposited grains, entering the amount in the bin cards and recording it into the store ledger, as well as checking with the bank if the disbursements are effected accordingly into the respective accounts of farmer groups or association. Once the money was paid by the buyer, through the financing bank, the depositors could only access the money when the buyer gets a release order from the bank. Thereafter the transaction could proceed and the interest deducted by the bank. Ideally, a Bank officer was supposed to be available to verify and sign relevant documents when the buyer takes the grains from the warehouse.

Interview with the RUDI staff also indicated that the bank lending procedures were very cumbersome involving high transaction costs. Bank interest rates of 14 – 15% plus 1.5% loan processing fee were reported. The disbursement of the bank overdraft could take eight months from the date of application and submission of business plan (February – October). The application letter had to be sent to the Head office of the bank for further consideration and some time was spent for inspection of the warehouses and for board meetings. Note that the bank overdraft application required that copies of license, insurance and inspection certificates are attached. RUDI has helped the farmer groups and associations to write their business plans for bank overdraft application.

In Kilombero District, RUDI facilitated the registration of 10 warehouses for WRS and through USAID/COMPETE purchase and distribution of rice milling and grading machines to four farmer associations (Mang'ula A, Mkasu, Ifakara and Mbingu) in 2010 (Plate 13). According to the RUDI staff at Mang'ula, the cost of registration for a farmer association through the Ministry of Home Affairs (MoHA) was TZS 150,000. This excluded the cost of writing and printing the constitution (about TZS 300,000) and bus fare to the DC/DAS office in Ifakara town. The DAS lawyer reviewed the constitution section after section to ensure that it complied with legal requirements. The constitution was then attached together with the application letter before it

was sent to the Ministry of Home Affairs for consideration.[46] The applicant had also to fill the Civil Society Application forms (*Fomu za Kuomba Usajili wa Chama cha Kijamii*) (S.A I and S.A II) indicating the particulars of leaders of the association, signed with their passport sizes attached. Four copies of the constitution of an association were submitted to the DC's office, out of which 3 were submitted together with the application for registration to the MoHA - two were retained and one was given to the applicant with all pages stamped.

Plate 13: Rice grading machine at Mang'ula 'A' warehouse facility

5.2 Costs and Benefits

5.2.1 Producer costs and margins

Grain farmers in the study districts incurred a wide range of production costs. This subsection presents the cost and margin structures for selected crops. In Kilombero District, a typical smallholder farmer (member of Vijana Mbasa Farmer Group) who produced paddy was estimated to incur a total cost of about TZS 1.5 million per acre (Table 13). This was comparatively higher than the production cost of TZS 988,625 per acre for an average smallholder farmer who adopted the System of Rice Intensification (SRI) at Igomelo smallholder irrigation scheme in Mbarali District (Table 14).

[46] Civil Society Organizations are currently registered under five different government acts. The majority are registered under the Society Ordinance of 1954, regulated by the Registrar of Society in the Ministry of Home Affairs. For registration under this ordinance the organization concerned must have a Constitution, a minimum of 15 members, a Steering Committee/or Board and regular meeting of the Committee/Board. An NGO can register with the Ministry of Home Affairs if it is an association; Ministry of Justice and Constitutional Affairs if it is Trustee incorporation; or the Ministry of Trade and Industry if it is a Company depending on its objectives.

Table 13: Production cost for smallholder paddy farmers – members of Vijana Mbasa Farmer Group in Kilombero District, 2016/2017

Item	Cost (TZS/acre)
Land renting	50,000
Land clearing	40,000
Seeds	24,000
Planting	100,000
Ploughing/tilling (*Kukatua*)	50,000
Bund making (*kutengeneza matuta*)	40,000
Grass picking (*kuokota majani*)	20,000
Harrowing/puddling (*kuvuruga*)	50,000
Levelling (*kusawazisha*)	45,000
Fertilizer application (*mbolea ya kupandia*)	140,625
Fertilizer application (*mbolea ya kukuzia*) x 2	120,000
Herbicides	50,000
Pesticides	25,000
Spraying	10,000
Transport (fertilizers)	3,000
Weeding	100,000
Second weeding	50,000
Bird scaring	100,000
Harvesting/slashing	50,000
Assembling of slashed paddy	30,000
Threshing (*kupiga mpunga*)	75,000
Winnowing (*kupepeta*)	50,000
Purchase of bags (*kununua maloba*)	25,000
Sun-drying	25,000
Loading into bags and sewing	17,500
Transportation cost (from farm to home)	125,000
Loading and offloading	25,000
Storing into warehouse (*kupanga gunia stoo*)	12,500
Management costs (*gharama za usimamizi kwa jumla*)	50,000
Total	**1,502,625**

Table 14: Rice production costs for SIR at Igomelo smallholder scheme (per acre), 2016/17

Activity	TZS
Land preparation/clearing	30,000
Ploughing/tilling (*kukatua*) using ox plough	60,000
Harrowing/puddling (*kuvuruga*) using power tiller	70,000
Purchase of seeds (5 kg)	15,000
Nursery preparation (*kutengeneza kitalu*)	8,000
Seed soaking 24hrs (*kuloweka*), rancid 48 hrs (*kuvundisha*)and sowing (*kusiha*)	10,000
Seedling transplanting (after 8 days)	110,000
Application of fertilizer I (YARAMILA SERIAL) (75 kg) after 6 days	85,500
Cost of labour for application of fertilizer I	10,000
Application of herbicide (14 - 20 days) 1 litre of 2,4-D/YARAVITA CEREAL BOOST)	10,000
Cost of labour for application of herbicide	10,000
Sprayer hiring (TZS 5,000 per day)	5,000
Application of fertilizer II - 50 kg of YARAVERA AMIDAS (3 days after application of BOOST)	57,000
Application of pesticide (Tricyclazole) 1 litre (21 days after transplanting)	20,000
Cost of labour for application of pesticide	10,000
Thinning/weed removal (*kung'olea na kuondoa magugu*)	50,000
Application of fertilizer III - YARALIVA NITRABOR (25 kg)	32,000
Bird scaring (50,000 x 1.5 months)	75,000
Harvesting – manually	
Slashing (*kufyeka*) of mature/dry rice panicle and spikelets	50,000
Assembling of slashed panicle and spikelets	50,000
Threshing (*kupiga mpunga*)	70,000
Winnowing (*kupepeta*) - 30 bags each TZS 1,000	30,000
Purchase of bags (*kununua maloba*) - 30 bags each TZS 1,000	30,000
Purchase of sewing threads/ropes (*kununua kamba za kushonea*)	1,000
Loading into bags and sewing (*kupakia kwenye gunia na kushona*) - 30 bags each TZS 1,500	45,000
Transportation cost (from farm to home) - 30 bags each TZS 1,000	30,000
Cost of repacking into bags if sold at home - 30 bags each costing TZS 500	15,000
Total	**988,500**

Production costs for a maize and pigeon pea intercrop in Karatu District were estimated to range from TZS 350,000 – 400,000 per acre. The producer prices for different grains and cropping seasons in 2015/16 are shown in Table 15.

Table 15: Average producer prices for different cereals and legumes in Karatu District, 2015/16

Type of crop and season	TZS per kg
Beans	1,400.00
Yellow Soya	1,450.00
Red Canadian wheat	1,200.00
Combat wheat	1,100.00
Barley - Grade I	900
Barley - Grade II	1,000.00
Maize (Short season)	420
Maize (Mid season)	600
Maize (Last season)	1,200.00
Pigeon peas (Short season)	720
Pigeon peas (Mid season)	950
Pigeon peas (Last season)	1,100.00

The FGD farmers at Rhotia ya Kati village in Karatu District estimated the production cost to average at TZS 600,000 per acre. They mentioned price volatility and market unreliability as one of the key challenge: in 2015/16 season for example, farmers at Rhotia ya Kati village expected to sell their pigeon peas at TZS 700 per kg but producer prices went down to as low as TZS 200 per kg, which discouraged the producers.

Participants of FGD at Milengwelengwe village in Morogoro Rural District reported production costs to average at TZS 800,000 and 500,000 per acre and average yields of 20 and 15 bags of 120 kg for paddy and maize respectively.

5.2.2 WRS related costs

Different actors incur different costs in operating WRS. At the smallholder farmer level the system required that the commodity is aggregated and stored into a suitable warehouse and operated by a registered operator. This implies that a substantial amount of money was required to cover the costs of warehouse rehabilitation or construction as well as the costs of warehouse registration and licensing.

According to the interview with RUDI staff, the procedure registering and applying for warehouse operation license required that the Board (TWLB by then) of the Ministry of Trade, Industry and Investment inspects and certifies that the warehouse meets the required criteria for warehouse (e.g. height of 1 – 1.5 m foundation, availability of warehouse equipment, like pallets, weighing balance/scale, moisture meter, etc). After the warehouse operator has filled in the respective forms depending on the warehouse grade and the warehouse has been qualified for WRS operation then the applicant was licensed. By then, the warehouse operator had to pay TZS 750,000 for acquisition of the license. Other cost elements included crop

insurance (TZS 900,000 per warehouse); cost of purchasing a moisture meter (TZS 2.2 million), digital weighing balance/scale (TZS 2.5 million), fire extinguisher (TZS 85,000), canvas sheets (*maturubai*) (TZS 30,000 – 80,000); pallets (each TZS 106,000 – 110,000 – 120,000); fumigation cost (1 month before storing the grains) was estimated at TZS 145,000 per warehouse, including the cost of chemical (e.g. Fendona, 300 ml) which was TZS 60,000 per warehouse.

The depositors have incurred three main types of WRS operational costs:

a) Transportation and logistical costs associated with bringing the goods to the warehouse;
b) Storage fees charged by the warehouse operator for handling and storing services (including any grading, drying, cleaning, fumigating fees that may be required to store the commodity properly);
c) Financing costs (i.e., interest and fees) charged by the bank for financing the goods in storage in case the warehouse receipt is used as collateral for a loan.

The interviewees at Mbingu reported transportation cost of TZS 2,000 per bag of paddy in 2010/11, when the commodity was budged from the farm to the warehouse using a bicycle. This increased to TZS 5,000 in 2017 or TZS 6,000 per bag if transported using a bicycle or motorbike respectively.

The old Mbingu village has recently been divided into two villages namely Vigaeni and Mbingu. In addition to transport and warehouse operational costs farmers cultivating paddy at Mbingu (the new village) pay a levy (as part of the village government revenues). Farmers who resided in the village paid TZS 2,000 per acre and those who came from other areas paid TZS 5,000. This added to the total cost of producing paddy. The buyers paid TZS 400 – 500 per bag of paddy as village levy and TZS 3,000 per bag of milled rice as District Council's levy. Some of these levies have, of recent being abolished by the government, especially for when the transported grain has weight of less than a ton.

Storage costs for depositors have ranged from the lowest of TZS 1,000 per bag (e.g. at Mang'ula and Mbingu) to the highest of TZS 3,000 per bag. The WRS storage charges for the AKIRIGO warehouses in Kilombero District ranged from TZS 10/kg in 2007 to TZS 15/kg and TZS 20/kg in 2008 and 2009 respectively. When a buyer wanted to process the paddy into rice, he/she had to incur an additional cost (milling cost) of TZS 50 per kg and warehouse administration or management charge of TZS 15 per kg.

Elsewhere in Morogoro Rural District, depositors of grains at Mtego wa Simba paid a storage charge of TZS 3,000 per bag of 100 kg for 10 months which differed from storage charges applied elsewhere in the district, e.g. at Milengwelenge where the depositors were charged TZS 2,500 per bag of 120 kg for a storage period not exceeding 6 months; and MKIMAKA Group warehouse in Kiroka village where the storage charge was TZS 2,000 per bag of 120 kg stored for not more than 6 months.

According to interviewees at Mbingu and Katurukila villages, farmers associations had literally incurred additional costs, though some were covered through different supports. These have

included the expenses of purchasing warehouse equipments like fire extinguishers at TZS 100,000 per unit; weighing balance/scale at TZS 400,000; moisture meter at TZS 2 million; and eight pallets valued at TZS 400,000 to 600,000 in 2009.

Examples of financing costs for AKIRIGO farmers are presented in Table 16 (for the period 2007 – 2009) and Table 17 (for 2012/13 season). In 2012/13, the AKIRIGO Apex applied a bank overdraft facility of TZS 135,000,000 from NMB for WRS operation. Out of the overdraft, only 13,091,233 were spent for WRS financing because of the operational bottlenecks discussed elsewhere in the previous sections: this resulted in total repayment of TZS 16,648,643.

Table 16: Rice WRS financing, storage, prices and operating costs for AKIRIGO farmers, 2007 - 2009

Year	Bank overdraft TZS Million	Quantity of paddy deposited (kg)	Selling price (TZS/kg)	Payments (TZS/kg)		WRS Operating cost (TZS/kg)	Net payment (TZS/kg)
				1st	2nd		
2007	30	137,600	374	150	224	31	343
2008	36	101,100	558	200	358	36	522
2009	235	312,000	475	300	125	42	433

Source: AKIRAGO Office records

Table 17: WRS storage, financing, repayment and operating costs of paddy for AKIRIGO farmers, September, 2012 – March 2013

Warehouse (Month)	Quantity deposited (kg)	Management cost (TZS 20/kg	Loan Fee (TZS)	Interest (19%)	Bank cost (TZS)	Loan repayment (TZS)	1st Payment (TZS)	Total deductions (TZS)
Mang'ula A (Sept 2013)	20,280	405,600	430,650	542,819	20,304	2,178,000	4,897,620	5,891,393
Mbasa (Sept 2013)	21,000	420,000	430,650	562,091	20,304	3,400,000	5,071,000	6,084,545
Katurukila (Sept 2013)	10,029	200,580	430,650	153,394	20,304	2,600,000	2,422,003	3,026,352
Mbasa (Dec 2013)	2,905	58,100	-	44,340	-	-	700,105	744,445
Mkasu	-	-	430,650	-	20,304	-	-	450,954
Mbingu	-	-	430,650	-	20,304	-	-	450,954
Total	**54,214**	**1,084,280**	**2,153,250**	**1,302,644**	**101,520**	**8,178,000**	**13,090,728**	**16,648,643**

Source: AKIRAGO Office records

Interviews with representatives of farmers at Mabadaga listed the warehouse costs in 2016/17 to include among others, registration fee (TZS 150,000), insurance (TZS 1,500 per bag of 100 kg), warehouse operator (TZS 2,000/bag), warehouse (TZS 500 per bag), Fire (TZS 500,000), transportation from farm to warehouse (TZS 2,000 per bag). Poor infrastructure in the scheme contributed to high transportation costs (many blocks/plots cannot be reached by vehicles which necessitated the use of porters or animals like donkeys) at TZS 10,000/bag to transport

the bag to a passable road, TZS 1,000 for loading, TZS 2,000 for transportation, and TZS 1,000 per bag for off-loading. Note that an empty bag was purchased at TZS 1,000. The cost of milling paddy into rice was reported to average at TZS 2,000 per bag. For reasons which could not be stated milling prices at Uturo could go as high as TZS 6,000 to 7,000 per bag.

WRS financing institutions also charged high interest rates which discouraged farmers from engaging in effective WRS. For example, interest rates of 18% and 19% were charged by financing institution for AKIRIGO and AMBERICO farmers. Interviews with representatives and leaders of AKIRIGO suggested more interest charges, for example when the bank overdraft was channelled through the IPA SACCOS in Ifakara: this SACCOS was charging an addition interest rate of 6% for the service. Interviews with representative and leaders of the Katurukila Farmers Association in Kilombero District indicated that the association paid a loan application fee (*ada ya mkopo*) or establishment fee of 1% (which amounted to TZS 400,000) in 2009.

A private warehouse owner in Karatu District (Mr. Pius Bilauri Deleku) who has recently started to store maize, pigeon peas, beans, wheat/barley in 2016 reported to pay TZS 2.5 million as fumigation cost and TZS 2.4 million as salaries for two operators per annum. He reported the investment cost of the warehouse which has a storage capacity of 100 tons (10,000 bags) to amount to TZS 140 million.

Interviews with transporters (Winner Kitembe and Qorro Plutic) in Karatu District indicated that on average, each was able to transport about 200 – 250 tons of maize, pigeon pea, common beans, wheat and barley per season at an average cost of TZS 7 million per season (including driver's and assistant's wage, lorry service costs, payment for other charges such as insurance, levies, and taxes). The transporters were paid TZS 5,000 per bag of grains (100 kg) as service charge. They complained about high levies and taxes of TZS 200,000 per trip and TZS 1,005,000 respectively, double payments of LGAs' levies (at the storage site and area of destination), high costs of fuel, and delayed payments from the warehouse operators.

Overall, WRS costs have varied from one season to another and WRRB has continued to review and approve new cost structures as mandated by the Act Number 10 of 2005 (Section 6(1)(a). According to the interview with staff of WRRB, warehouse operators are required to charge a lien of not more than TZS 25 per kg of the deposited grain. As of recent, WRRB has guided that the lien be paid by the buyer and not the depositor though the cost will always be imbedded in the final producer price and therefore still borne by the producer. The Board charges TZS 2 per kg as WRS administrative cost. An example of approved cost structure for 2014/15 season is given in Table 18 and the cost estimates of storing commodities for rented warehouses, as provided by WRRB for the 2016/17 season are presented in Table 19.

Table 18: Approved cost structure of WRS, 2014/15 (W.E.F: 1st April 2014)

Type of fee	Nature of fee	Payer	Unit	Amount (TZS)
1. Application Form	Warehouse Business License	Applicant	Form	10,000
	Warehouse Operation License	Applicant	Form	10,000
	Warehouse Inspector's License	Applicant	Form	10,000
2. Late Application Extra Charge	Grade "C" Warehouse Operation License	Applicant	Form	500,000
	Grade "B" Warehouse Operation License	Applicant	Form	750,000
	Grade "A" Warehouse Operation License	Applicant	Form	1,500,000
3. Warehouse Business License	Grade "C" Warehouse Business License	Applicant	Ton	100
	Grade "B" Warehouse Business License	Applicant	Ton	200
	Grade "A" Warehouse Business License	Applicant	Ton	200
4. Warehouse Operation License	Grade "C" Warehouse Operation License	Applicant	License	50,000
	Grade "B" & "A" Warehouse Operation License	Applicant	License	500,000
5. Warehouse Administration Fee	Grade "A", "B" & "C" warehouses	Applicant	kg	0.5
6. Warehouse Inspector License Fee	Warehouse Inspector's License	Applicant	Year	200,000
7. Warehouse Inspection	Requested/Appeal Inspection	Requestee	Lot	As approved by the management
8. Training Charges	Applicant at Head Office	Applicant	Person/Day	As per training policy
9. Warehouse Operation Lien+*	Lien	Depositor/Buyer	kg	14
10. Warehouse Operation Lien+*	Lien	Buyer	kg	10
11. Storage of the commodity after expiry date in receipt+*	Depositor/Buyer	Depositor/Buyer	Ton/Day	300
12. Minimum Performance Bond (10% of the value of the business)	Cash deposits	Warehouse Operator	Grade "A"	20,000,000
			Grade "B"	5,000,000
			Grade "C"	1,000,000
	Banker guarantee	Warehouse Operator	Grade "A"	20,000,000
			Grade "B"	5,000,000
			Grade "C"	1,000,000
	Landed properties (Title/Certificate)	Warehouse Operator	Grade "A"	50,000,000
			Grade "B"	12,500,000
			Grade "C"	2,500,000

+ VAT Inclusive
* The storage period is as described in the warehouse receipt
*** The recovery for any loss which shall be caused by warehouse operation should start six months after date Form number 7 was dully signed and filed by the two parties
Source: http://www.wrs.go.tz/downloads/forms/fee.pdf

Table 19: Estimated costs of storing 12 million kilogramme of grain for rented warehouses in 2016/17

Item	Nature of cost	Units	Rate (TZS)	Monthly cost/Income	Frequency	Total Value (TZS)
A) HANDLING CHARGES (VAT INCLUSIVE)	Lien	2,000,000	25.00	50,000,000.00	6	300,000,000.00
B) STORAGE CHARGES (VAT INCLUSIVE)	Lien	6,000,000	1.50	10,500,000.00	6	63,000,000.00
C) PENALITIES CHARGES AFTER 183 DAYS (VAT INCLUSIVE)	Demurrage	2,400,000	3.00	18,000,000.00	1	18,000,000.00
SUBTOTAL INCOME		**183**	**31.75**	**78,500,000.00**	**6**	**381,000,000.00**
A) HANDLING COSTS						
Manager	Salary	1	750,000.00	750,000.00	12	9,000,000.00
Warehouse Supervisor	Salary	1	500,000.00	500,000.00	12	6,000,000.00
Documentation Clerk	Salary	1	450,000.00	450,000.00	12	5,400,000.00
Assistant Accountant	Salary	1	450,000.00	450,000.00	12	5,400,000.00
Quality Controller	Salary	1	450,000.00	450,000.00	6	2,700,000.00
Quality Controller Assistant	Salary	2	350,000.00	700,000.00	6	4,200,000.00
Tally Clerks	Salary	2	350,000.00	700,000.00	6	4,200,000.00
Clerk - Weight Measurement	Salary	1	350,000.00	350,000.00	6	2,100,000.00
Driver/Shuttle Services	Salary	1	350,000.00	350,000.00	6	2,100,000.00
Staff Welfare	Food, Accommodation	11	5,000.00	55,000.00	150	8,250,000.00
Casual Labourers (Loading and Offloading)	Wage/Bag	125,000	400.00	50,000,000.00	2	100,000,000.00
Casual Labourers (Quality, Cleaner, Diggers etc)	Wage/Bag	125,000	160.00	20,000,000.00	1	20,000,000.00
Repair and Maintenance - Weigh bridge	Bill	1	5,000,000.00	5,000,000.00	1	5,000,000.00
Board of Directors Meeting	Fee	4	100,000.00	400,000.00	3	1,200,000.00
Warehouse Operation License Application Fee	Fee	1	20,000.00	20,000.00	1	20,000.00
Fidelity Insurance	Premium	4	1,000,000.00	4,000,000.00	1	4,000,000.00
Electricity	Bill	1	300,000.00	300,000.00	12	3,600,000.00
Water	Bill	1	50,000.00	50,000.00	12	600,000.00
Security - During Season	Bill	1	1,000,000.00	1,000,000.00	6	6,000,000.00
Sundries and Stationeries	Lumpsum	1	100,000.00	100,000.00	30	3,000,000.00
Medical Care	Charges	1	300,000.00	300,000.00	6	1,800,000.00
External editors Fee	Fee	1	2,000,000.00	2,000,000.00	1	2,000,000.00
Communication (Telephone, fax, Postal, etc)	Bill	1	150,000.00	150,000.00	6	900,000.00
SUBTOTAL		**183**	**16.46**	**88,075,000.00**	**6**	**197,470,000.00**
B) STORAGE CHARGES						
Repair and Maintenance – Pallets	Bill	1	1,000,000.00	1,000,000.00	1	1,000,000.00

Item	Nature of cost	Units	Rate (TZS)	Monthly cost/Income	Frequency	Total Value (TZS)
Repair and Maintenance – Buildings	Bill	1	1,000,000.00	1,000,000.00	1	1,000,000.00

Source: WRRB

Other WRS costs relate to levies and taxes charged by the Tanzania Revenue Authority (TRA). In WRS TRA is mandated the role of administering Value Added Tax (VAT) on service provided by warehouse operators; charging Withholding Tax on rent of the warehouses; and administering Stamp Duty of the annual rent of the lease agreement of the warehouses. With the exception of agricultural based warehouses, the authority is also charges the Service Development Levy (SDL) on gross salaries and wages of the warehouse operator's employees. SDL is levied at 6% of the payroll emoluments, of which 2% goes directly to the Vocational Education and Training Authority for the purposes of providing skills to the workforce that employers require.

A warehouse business person is also required to pay Corporation Tax. The Corporation Income Tax is a tax levied on corporation taxable profits for all companies registered and/or doing business in Tanzania. The applicable Corporation Income Tax rate in Tanzania is 30%, and is usually paid in two stages: as provisional tax paid based on the taxpayer's own estimates at the beginning of the business year; and final tax paid after the official assessment of the total income in the respective year of income.

VAT is a consumption tax charged on taxable goods, services immovable property of any economic activity whenever value is added at each stage of production and at the final stage of sale. VAT is charged on both locally produced goods and services and on imports. Value Added Tax is charged by persons registered for VAT only. VAT is charged on any supply of goods, services and immovable property of any economic activity in Mainland Tanzania where it is a taxable supply made by a taxable person in the course of economic activity carried by him. The importation of taxable supply from any place outside Mainland Tanzania is charged VAT and normal Customs Laws and procedures apply. All supply consumed or enjoyed outside Mainland Tanzania is zero-rated upon proof. VAT is chargeable on the taxable supplies of goods and services. The rates are 18**%** for standard rated supplies, and 0% for exports of goods and services.

Another charge is the Withholding Tax, also called the Retention Tax. This is a tax which a payer of an item of income withholds or deducts from the payment, and pays it to the government. It is the amount of tax retained by one person when making payments to another person in respect of goods supplied or services rendered by the payee. Withholding tax applies to specific payments including payment that is to be included in calculating the chargeable income of an employee from the employment, payment of investment return including dividend, interest, natural resource payment, rent or royalty, payment in respect to service fee and contract payments and payment in respect to supply of goods to the government and its institutions. In Tanzania, Withholding Tax applies mostly to income from employment. An example of this is a tax on salary or income of an employee (PAYE). Section 81 of the Income Tax Act requires an employer to withhold tax from the payments made to an employee. The employer is required by Section 84 (1) to pay the tax withheld to TRA within seven days after the end of each calendar month.

5.2.3 WRS benefits

Depositors will be willing to engage in WRS if the costs of the system are offset by the benefits of:

a) Lower potential post-harvest losses due to inadequate local or self-storage
b) Delayed sale during oversupply market conditions and possible price increases after harvest season
c) Opportunity to have products graded as part of the storage process
d) Availability of insurance coverage, and
e) Access to credit opportunities, using the warehouse receipt as collateral. It is important that storage fees charged as part of a WRS are regulated and standardized, and designed to be affordable for users, including the smallholder farmers.

From the perspective of warehouse operators, the volume of business and associated profit generated through the WRS need to be sufficient to cover the main costs (e.g., fixed costs like insurance cost or rental fees if the warehouse is leased and variable costs like staff or electricity costs) and ensure a return on the investments made (e.g., investments to build, buy or refurbish the warehouse and investments in grading, weighing and other equipment).

From the perspective of the WRS regulatory body, the income derived from the WRS (e.g., licensing and inspection fees paid by licensed warehouse operators or fees on warehouse receipts) cover the cost of organizing the WRS (e.g., office overhead and personnel costs for the WRS regulatory body's management and inspectors, creation and maintenance costs for the warehouse receipt registry). The benefits and challenges of WRS for different groups of user are narrated in Table 20.

Table 20: Benefits and challenges of the WRS for each type of users

Types of WRS users	Benefits	Challenges
Producers	• Meeting quantity and quality criteria imposed to participate • Offsetting transportation costs, storage and handling fees and financial costs	• Meeting quantity and quality criteria imposed to participate • Offsetting transportation costs, storage and handling fees and financial costs
Traders	• Increasing business opportunities through better access to credit • Monetizing warehousing space	• Managing increase in market transparency and the associated increase in competition for commodities
Processors	• Improving inventory management and lowering cost of working capital thanks to better access to long-term storage financing • Improving access to better quality raw materials	• Managing increase in market transparency and the associated increase in competition for commodities

Source: World Bank (2016)

5.3 Warehouse Capacity Utilization

5.3.1 WRRB-licensed warehouses and capacity

By 6th April 2018, WRRB had licensed only 28 warehouses (with total storage capacity of 151,700 tons) to operate under WRS for the 2017/18 season (Table 21). Of these, 60.7% were for cashew (with storage capacity of 120,000 tons or 79.1% of the total storage capacity WRRB licensed warehouses). Only one and five warehouses were licensed for maize and paddy respectively, with total storage capacity of 19,000 tons or 12.5% of the total capacity for WRS licensed storage facilities. The distribution of licensed storage facilities by regions and districts is show in Table 22. According to the discussions with staff of WRRB, the storage facilities registered to operate WRS in grains are relatively very few, especially for maize because the risky nature of crop. The crop can easily be damaged by harmful insects and rodents when in store and hence the risk of crop losses if not properly handled. A similar case, for example, was reported in 2016/17 season for the Handeni (Nduguti) warehouse though the actual figure of loss was not readily available at the time of interview.

Table 21: Proportion of WRRB licensed warehouses by crops, 2017/18 season

Crop	Number	% Number	Capacity (Tons)	% Capacity
Maize	1	3.6	3,500	2.3
Paddy	5	17.9	15,500	10.2
Coffee	5	17.9	12,700	8.4
Cashew	17	60.7	120,000	79.1
Total	**28**	**100**	**151,700**	**100**

For paddy, a few warehouses were licensed in Mbarali district (including the Madibira warehouses) and in Mvomero District (the Dakawa warehouse construct under the MIVARF project). Silverlands Tanzania Ltd also is underway to license its silos (40 tons) under WRS, mainly for soybeans. The company has already started to discuss with WRRB about the plan.

With its Head office and production facilities at Makota Farm, Ihemi Village in the Iringa region the company commenced its operation with day-old-chick and poultry feed production in 2014 for commercial and small-scale chicken farmers in Tanzania. At the beginning of 2017, the company has commissioned new infrastructure for feed production and raw material storage. Its fully computerised feed mill can produce 40 metric tonnes of quality chicken feed per hour.[47] Together with the increased storage capacity of 32,000 metric tons, the company is now operating one of the largest feed production plants in Eastern Africa (*ibid*).

The company has also partnered with the World Poultry Foundation to implement the African Poultry Multiplication Initiative programme in Tanzania. Through the distribution of SASSO day-old chicks, the company will provide improved genetics to the small-scale rural farmer together

[47] See: http://silverlands.dudumizi.com/about-us.html

with technical assistance and training, and offer them access to markets that may not have been possible before.

Table 22: WRRB licensed warehouses, 2017/18 season

Region	District	Crop	Capacity
Iringa	Itunundu	Paddy	3,000
Katavi	Mwamapuli-Mpimbwe	Paddy	1,000
Kilimanjaro	Moshi	Coffee	500
Kilimanjaro	Moshi	Coffee	1,000
Kilimanjaro	Moshi	Coffee	700
Lindi	Lindi Urban	Cashew	10,000
Lindi	Lindi Rural	Cashew	5,000
Lindi	Nachingwea	Cashew	10,000
Lindi	Kilwa	Cashew	1,000
Lindi	Liwale	Cashew	3,000
Mbeya	Mbeya Rural	Coffee	500
Mbeya	Mbarali - Madibira	Paddy	5,000
Mbeya	Mbarali	Paddy	3,000
Morogoro	Mvomero	Paddy	3,500
Mtwara	Newala	Cashew	10,000
Mtwara	Mtwara Urban	Cashew	10,000
Mtwara	Nanyumbu	Cashew	2,000
Mtwara	Masasi	Cashew	10,000
Mtwara	Newala	Cashew	10,000
Mtwara	Masasi	Cashew	7,000
Mtwara	Mtwara Urban	Cashew	10,000
Mtwara	Newala	Cashew	10,000
Mtwara	Tandahimba	Cashew	15,000
Ruvuma	Tunduru	Cashew	5,000
Ruvuma	Tunduru	Cashew	1,000
Ruvuma	Tunduru	Cashew	1,000
Ruvuma	Mbinga	Coffee	10,000
Tanga	Handeni	Maize	3,500

Source: WRRB records, 6th April 2018

5.3.2 Warehouse capacity and utilization in selected areas

Warehouse capacity utilization differed from one area to another depending, among other things, on the production level (largely determined by weather), location of warehouse from the farm, level of aggregation and leadership for warehouses operated by group farmers, and competition from private warehouse service providers.

In other places, organized smallholder farmers (e.g. at Herman and Matebete irrigation schemes) do not own community warehouses. They therefore have to hire the facility from private dealers. In many cases, such hired facilities are not enough to store all the produce. For example, in 2016/17 farmers at Matebete scheme hired a private warehouse (Dan Kiaga) with a capacity of only 158 versus 200 tons which were produced. Farmers at Herman scheme also hired a warehouse owned by a private person (Kyando) with the capacity of storing only 316 tons. Table 23 presents the status of storage capacity utilization for selected warehouses in Mbarali District. More details about the storage capacity (of both public/community and private warehouses) in the study districts are provided in Appendix 5 through Appendix 9.

In 2016/17, the total storage capacity in Kilombero District was 83,375 tons: 88.1% (73,425 tons) under warehouses operated and owned by private people and only 5.8% (4,830) for those operated by public/village or cooperative societies. About 6% of the total capacity was under the warehouses which were un-operational for different reasons including the lack of commodities to store, ownership/user conflicts or warehouses being under rehabilitation or construction. The total storage capacity in Mbarali District was 72,330 tons: 75.5% (54,630 tons) under private warehouses and only 24.5% (equivalent to 17,700 tons) under the public and community storage facilities.

In 2016/17, the available warehouses in Mbozi District had a total capacity of storing 22,640 tons of commodities though about 2% (420 tons) of the capacity was not operation. The public/village and cooperative warehouses (rehabilitated through the BRN initiative) had capacity of 13,700 tons or 60.5% of the total storage capacity in the district. The operational private warehouses had capacity of 8,520 tons or 37.6% of the total storage capacity in the district. The warehouses were used to store mainly coffee, maize, common beans, millets/sorghum and simsim.

Table 23: Capacity utilization for selected community warehouses in Mbarali District

Name of warehouse	History	Capacity (Tons)	Actual storage (Tons)		Remarks
			2015/16	2016/17	
Mbuyuni (BRN)	Build under BRN initiative (2015 - Feb 2017)	3500	Under construction	400	2016/17 was a bad year. Interviews with different stakeholders suggested that could attain it full storage capacity as it is used by many farmers (more than 3,000)
Mbuyuni (ACT-TAP)	Rehabilitated in 2011 under TAP Programme	350	Full capacity		
Majengo	Built by AMCOS in 1980's and rehabilitated by RUDI	350	Full capacity	53.8	2016/17 as a bad year and competition from privately owned warehouses
Motombaya	Build under BRN initiative. Before the facility farmers were using the Nsonyanga warehouse	3000	Under construction	106	2016/17 as a bad year and competition from privately owned warehouses
Nsonyanga	Rehabilitated by RUDI through AGRA in 2014. The warehouse has been utilized by farmers from Motombaya, Ipatagwa and Nyasakapyo till 2015/16. Used during the introduction of WRS	300	Full capacity	Under capacity	2016/17 as a bad year and competition from privately owned warehouses
Ipatagwa	Build under BRN initiative	3000	Under construction	225	2016/17 as a bad year and competition from privately owned warehouses
Azimio-Mswiswi	Old warehouse	300	Full capacity	85	2016/17 as a bad year and competition from privately owned warehouses
Uturo (BRN)	Build under BRN initiative	3500	Under construction	Not used	There were technical problems related to construction (warehouse requirements) which delayed its operation

Name of warehouse	History	Capacity (Tons)	Actual storage (Tons)		Remarks
			2015/16	2016/17	
Uturo (Old)	Rehabilitated by ACT-TAP Programme	350	Full capacity	Rented to a private dealer	NIL
Kongolo – Mswiswi	Build under BRN initiative	3000	Under construction	Not used	Not used in 2016/17 due to delayed completion/farmers did not make prior preparations. Farmers continued to use a privately owned warehouse facility (Kaponda who owned 3 warehouses)
Madibira	Three warehouses constructed in 1980s by the Ministry (MALF) - ownership still not yet transferred to the AMCOS at the time of study	4500	Full capacity	Full capacity	The Madibira farmers produced 5,460 tons of paddy/rice in 2016/17 (the rest, about 960 tons were stored in private warehouses)
UFACO (Chimala)	Old warehouse operated by the Usangu Farmers Cooperative	3000	Full capacity	Full capacity	NIL

In Mbozi District, the interview with DAICO indicated that 46 warehouses were rehabilitated through the UNDP/BRN initiative in 2013 – 2015 in two phases (26 and 20 warehouses with storage capacity of 8,700 tons and 5,100 tons in the first and second phases respectively). The costs of rehabilitation were reported to amount to TZS 1,556,692,279 and TZS 1,165,784,122 for phases I and II respectively.

In Karatu District there are several community warehouses constructed through support from different organizations and programmes, such as, the Food and Agriculture Organization (FAO) in 1980s, the Participatory Agriculture Development Empowerment Project (PADEP) in 2003/2004, the District Agriculture Development Programs (DADPs) in 2011/2012, and ACT/TAP in 2011. Most of these are owned by the village governments and cooperatives. The list of village warehouses visited by the study team in Karatu District and their respective storage capacity and, conditions and type of crops stored are shown in Table 24. The list of all warehouses in the district and their respective storage capacities is shown in Appendix 9.

Table 24: Visited community warehouses in Karatu District

Ward	Village/Warehouse	Capacity (T)	Condition/Status	Crops	Owner
Mbulumbulu	Upper Kitete	200	Good/operational	Grains	Village
	Slahhamo	200	Good/operational	Grains	Village
	Kambi ya Simba	200	Good/operational	Grains	Village
Rhotia	Kilimatembo	200	Good/operational	Grains	Village
	Chemchem	200	Good/operational	Grains	Village
	Kilimamoja	200	Good/operational	Grains	Village
	Rhotia Kati	200	Good/operational	Grains	Village
	Rhotia Kainam	200	Good/operational	Grains	Village

Appendix 8 presents a list of existing warehouses in Morogoro District. Overall the warehouse utilization in the district can be ranked as high but the districts has relatively fewer grain storage facilities than the other districts visited by the study team. Our visit and discussions with the management of Milengwelengwe village warehouse, for example, indicated that the warehouse has a maximum storage capacity of 300 which is fully utilized in good years. In 2016 annual storage volumes were 17.5 tons and 83.4 tons for maize and paddy respectively. Therefore a total volume of 100.9 tons of grains were stored in 2016, which were relatively smaller than the 131.1 tons stored in the previous year (2015).

Interview with the management of village warehouse at Mtego wa Simba in Mikese village, Morogoro Rural District indicated that; 478 bags; 10 bags and 2 bags of maize, paddy, and sorghum were deposited in 2015/16. These add to 490 bags of 100 kg for all grains deposited at the warehouse versus the maximum storage capacity of 600 bags per season.

5.3.3 Specifications of storage warehouses

This subsection presents some specifications of storage warehouses recommended for cereal and legume smallholder farmers in the study districts. These specifications are based on the thorough analysis of the situation of smallholder farmers in the study districts as well as the review of various technical guidelines for calculating storage requirements. The literature shows that: of the total warehouse's surface capacity only 70% should be considered as available for actual storage space.[48] The remaining 30% is used to ensure proper ventilation, passageways, handling space and repacking areas. Based on this understanding, the following formula was therefore used to estimate storage warehouse capacity:

[Length x Width x (Height – 1 m)] x 70% = approximate storage capacity of warehouse

It is technically recommended that storage capacity should be calculated at least a metre below the actual height of the warehouse ceiling. Moreover, few items should be stacked higher than 2.5m to avoid damage to the grains or the risk of stacks toppling over (*ibid*). In this study, the usable volume or space and warehouse storage requirements were estimated using the rule of thumb that one metric ton of grain and pulses requires approximately two metric meters of storage space, whether the bags are end to end or stacked in layers. From the analysis of existing situation of the smallholder farmers in the study districts, the following three types of storage warehouses and respective specifications are recommended (Table 25):[49]

a) *Medium storage warehouses*: These are storage facilities with capacities ranging from 200 – 799 metric tons and will mainly serve as collecting centres at the village level. Farmers located distant from the warehouses owned by AMCOS and/or Apex bodies will use these facilities as primary aggregation centres. Warehouse operators will need to have their staff right from this level. The typical specifications for an average medium storage warehouse in the study area were set for capacity of 210 metric tons;

b) *Large storage warehouses*: These are meant for mini AMCOS with storage capacity of 800 – 1,999. The specifications for large storage facilities were set for an average capacity of 840 metric tons metric tons; and

c) *Very large storage warehouses*: These are meant for mega AMCOS (like Madibira) and Apex bodies (like AKIRIGO and AMBERICO) which require huge storage facilities with capacities of more than 2,000 metric tons. The specifications for these facilities were set for an average capacity of 2,842 metric tons.

[48] See: https://dlca.logcluster.org/download/attachments/9405292/LOG-2-6-WAREHOUSE-SAMPLE-Calculating%20Warehouse%20space.pdf?api=v2

[49] Note that the categorization of these storage facilities is not necessarily universal but it was contextualized to smallholder situation in the study districts.

Table 25: Recommended specifications of storage warehouses for cereal and legume smallholder farmers in the study districts

Parameters	Type of godown		
	Collecting centres	**Mini-AMCOS**	**Mega-AMCOS/Apex**
Category (size)	Medium	Large	Very large
Length (M)	20	40	58
Width (M)	10	15	28
Height (M)	4	5	6
Usable volume (M^3)	420	1,680	5,684
Storage capacity (MT)	210	840	2,842

6. WAREHOUSE RECEIPT SYSTEMS AND COLLECTIVE MARKETING

6.1 Overview

The performance and challenges of implementing WRS in the country are discussed in details in the previous sections. In this section, the intention is to link the preceding discussion on performance of WRS and identify areas for improvement and opportunities for blending WRS with collective marketing to ensure an inclusive and effective WRS for the cereal and legume subsectors in Tanzania.

It is important to note that collective marketing is not a new practice in the study districts and Tanzania at large. Often, the previous and existing WRS programmes have engaged smallholder farmer groups and coops practising some forms of collective marketing by enabling farmers to bargain and sell their deposited crops to buyers as a group. However, farmers have continued to suffer from a syndrome of a weak framework that does not help smallholder farmers to reap substantially from these arrangements. For example, access to agricultural credits and professionalize agricultural storage, which are critical to reduce post-harvest losses; improve the stability of market prices; ensure food security; and encourage formalization of businesses in the agribusiness sector have not improved as expected, especially in the cereal and legume subsectors.

Overall, lessons from pilot WRS in Tanzania and many other countries in Africa indicate that, WRS have been simple on paper but quite difficult to successfully implement in practice.[50] In addition, the systems have generally suffered from the lack of suitable storage infrastructure, legal and regulatory issues, lack of requisite skills, missing or weak complementary market institutions, difficulties in attracting key stakeholders especially bankers, problems encountered in ensuring smallholder participation and disabling elements in the policy environment.

6.2 Success Stories in Africa

The review of literature in this study identified some 'success stories' in the implementation of WRS in Africa. The purpose in this subsection is not to present a comprehensive list of success stories in Africa but a few that are extensively cited in the literature. One of these is the South Africa's silo receipt system which underpins the operation of the most mature commodity exchange in Africa. In fact, the South African Futures Exchange is widely viewed as one of the most successful Exchanges in Africa.[51] In this

[50] See: https://www.agrifinfacility.org/sites/agrifin/files/Webinar_presentation_TC_Warehouse%20Receipt%20Financing%20Reform%20Initiatives%20in%20Africa.pdf

[51] file:///C:/Users/user/Downloads/Report-of-TC-on-Commodity-Ecosystem-2.pdf

system, lenders tend to interlock agricultural production credit with crop marketing through the receipt system. This minimises the risk of loan default by ensuring that producers can obtain better prices which enable them to service the loans but also lenders have greater control over the main security, which is the deposited crop.

The Faso Jigi (in Mali) and the *Union des Groupements pour la Commercialisation des Produits Agricoles* (UGCPA) in Burkina Faso are also distinguished as providing some good examples, especially of how and where the WRS and Collective Marketing (CM) can work in synergy as more pragmatic systems to help smallholder farmers in the cereal and pulse subsectors.[52]

The Faso Jigi and UGCPA have developed into professional and efficient Farmers' Organization (FOs) with the capacity to collectively market their members' cereals through a wide range of services and a strong organizational structure (IFAD, 2016). In addition to collective marketing, they also provide farmers with advance payments, fertilizers bought in bulk and technical advice on improving yields. Faso Jigi and UGCPA have adopted organizational and management tools that use technical committees at the farmers' group level. These committees facilitate the marketing of members' produce through several steps: (i) assessment and validation of members' commitments on quantities; (ii) assessment of input needs; (iii) receiving and distribution of inputs; (iv) aggregation of production at the local level, checking quantity, quality, packaging and tracing the products; (v) credit recovery support; (vi) authorization of financial institutions to make advance payments (AP1 and AP2) into farmers' bank accounts; and (vii) providing farmers with information on the balance at the end of the marketing period and the level of dividends (IFAD, 2016).

Appointed by the general assembly, the marketing committee is responsible for: (i) handling funding requests coming from the technical committees; (ii) setting the selling price at the beginning of the farming season (based on the past three years) and at the end (based on market price and trends for the marketing period); (iii) supervising and coordinating all marketing-related activities; (iv) marketing products by responding to calls for tenders; (v) providing the executive committee of the FO with the balance of the marketing campaign, propose the rate of dividends and present the balance during the general assembly; (vi) ensuring good communication on the marketing system among members.

Ethiopia is identified as the most successful example of the International Finance Corporation (IFC)'s Warehouse Receipts Financing Initiative in Africa - an initiative which has been helping expand access to financing for farmers, traders, and cooperatives and develop agricultural commodities market since 2009.[53] Funded by donors, including Japan, the Netherlands, Belgium and Spain and co-sponsored by the Ethiopia Commodity Exchange (ECX), IFC's initiative

[52] IFAD (2016) defines collective marketing system as "a means of aggregating farmers' surpluses through their organizations and increasing their negotiating power."

[53] https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/whr-symposium-ethiopia

has increased the availability of WRS financing in the country. Small-scale producers are the target beneficiaries of the WRS.

Rural storage initiative can be undertaken through marketing cooperatives. Large and multi-tiered cooperative marketing structures sometimes do not have a very good record, but there is some evidence that primary societies or groups can work effectively in bulking commodities or goods for marketing through public warehouses. An alternative approach involves rural storage financed by a local micro-finance institution (MFI). A highly successful experience in Madagascar suggests that this can work well where the local MFI is integrated into a structured microfinance (MF) network that can provide necessary management and financial support (Mahanta, 2013).

6.3 Opportunities and Areas for Improvement

Based on the discussion presented in the previous subsections the following opportunities are identified for improvement of WRS in Tanzania. Firstly, there are already farmers groups and AMCOs practising some forms of WRS-collective marketing. These can serve as pilot groups for reforming WRS in the country. Important areas for improvement should include the strengthening the synergy between the two (i.e., WRS and collective marketing). To ensure the WRS-Collective marketing success, the key areas of improvement include the provision of market transparency and clear outlets for stored goods; promotion of adequacy of the storage infrastructure and trust of market players in storage. Vested interests need to be overcome and a wide variety of stakeholders need to be mobilized to gather support for reform.

Secondly, the country has already a WRS legal and regulatory framework which needs only reforming and strengthening to address the WRS-Collective marketing synergy and insulate the regulatory authority from political control. In particular it is important to address the potential to compromise in enforcing the laws and regulations as a result of control by any dominant interests. It is a great opportunity to engage stakeholders, build their understanding of WRS and get them keyed up while also creating legal instruments and practices to make the system secure. This is important in assuring the integrity of the WRS-Collective marketing.

Thirdly, there are already programmes and stakeholders (e.g. NGOs like RUDI) who support and are interested to provide WRS supports. It is important that these stakeholders as well as their practices and programmes are recognized and complimented. Practices which are an incentive to implement more comprehensive programs and combine forces with others include components on sensitization and training, assistance to the banking and warehousing industries and trading platforms into WRS reform projects. Examples of training needs include that for smallholder groups, which have to bulk and market collectively in order to meet quantity and quality requirements under the WRS-Collective marketing arrangement, as well as training for bankers to enable them shift from the “traditional” balance sheet-based financing to inventory-backed structured financing. Most of the previous WRS programmes had training and capacity building components but it is also important to

develop institutional capacity to deliver the required training on a sustained basis at national and regional levels.

Attracting participation by bankers in WRS has generally proved very challenging as a result only few bankers have participated. In fact, most bankers are charging high interest rates and their tightened prudential regulations have resulted into deepening of risk aversion in the banking industry and they have little or no incentives to finance WRS stakeholders, especially the smallholder farmers. However, lessons from the pilot WRS in Tanzania show that it is reasonable to start in the beginning with a few willing banks, usually local banks which enjoy greater scope in innovating and other banks will tend to respond by free riding on the positive experiences of the early up-takers.[54]

Lastly but not least, there are already grain storage facilities owned by villages or AMCOs, though most of these are old and not suitable for WRS. With government investment and financial supports from different stakeholders, these facilities can either be reconstructed or rehabilitated. In fact, a network of secure, well-run warehouses which are accessible to various depositors is an essential pre-requisite for a successful WRS. Their role in the grain market for example, is important as they can facilitate operational and financial arrangements and encourage investors' confidence in WRS as credible counter-parties.

[54] See: https://www.agrifinfacility.org/sites/agrifin/files/Webinar_presentation_TC_Warehouse%20Receipt%20Financing%20Reform%20Initiatives%20in%20Africa.pdf

7. PROPOSED MODEL OF WAREHOUSE RECEIPT SYSTEM

Based on the key infrastructural, financial, legal and regulatory challenges, the study recommends a ring-fenced WRS-Collective marketing and financing model for smallholder cereal and pulse farmers, especially those organized in groups. Ring-fencing means putting restrictions on a grant or fund, so that it can only be used for a particular purpose.[55] It refers to making an agreement, contract, etc in which the use of money is restricted to a particular purpose or the isolation of a particular project or investment in order to protect it from outside risk factors.[56] The model should initially be applied on a pilot basis involving farmers' apex bodies which have proved to be active and recorded satisfactory commitment and narratives in the operation of WRS, such as the AKIRIGO and AMBERICO in Kilombero and Mbarali Districts. Depending on outcomes of the pilot project, the model could then be extended to other farmer groups and associations. Ideally, the model aims to integrate the financing of WRS infrastructure and multifunctional facilities using a ring-fencing model; input financing through contract farming and facilitation of collective marketing.

Where suitable warehouses and processing infrastructure is non-existence, financial institutions, like NMB, CRDB, TADB and TIB, and other institutions, like PSSSF can inject funds for construction and installation of WRS infrastructure and working capital.[57] Then, the Bank and borrower (farmer group, AMCO or organization) enter into an agreement of a business which ensures that the two entities are benefiting from mutual engagement. The financial institution will also help provide the necessary technical backstopping and recruit qualified staff for the management and operations of the warehouse and processing facilities with repayment being operation – dependent and the management operations and cash flows closely monitored by the financier till when the project pays back for the loan facility. NMB has already indicated its willingness to participate in the ring-fencing model for a 5 year repayment period. The borrower will however be required to pledge 25% of the total loan facility. The bank is already conducting farmers training in warehouse governance, record keeping and selected agronomic practices - through the Rabo Foundation of the Netherlands. The Rabobank of Netherlands is one of the NMB shareholders with a current stake of 34%.[58] The Government of Tanzania (GoT) owns 31% of the total stake and the remainder is owned by other shareholders.

[55] https://www.collinsdictionary.com/dictionary/english/ring-fence

[56] http://www.businessdictionary.com/definition/ring-fence.html

[57] This is intended to address the challenge of inadequate scope of assets that can be used as collaterals for financing WRS.

[58] When NMB was privatised by the Tanzanian government in 2005, Rabobank acquired a 35% stake. As part of NMB's Corporate Social Responsibility policies, NMB joined forces with Rabobank Foundation in 2009 to create the NMB Foundation for Agricultural Development (NFAD) that aims to develop and support sustainable cooperatives that offer relevant training and support to farmers.

Some of the key requirements in the proposed model include the use of approved service providers to ensure quality control, for example, in the construction of the storage facilities and associated infrastructure. The borrowers should also have some own initial capital in their bank account to cover for the 25% pledge. Some farmer groups and AMCOS have already started to build their own capital through crop contribution. A typical example is the Vijana Mbasa farmer group in Ifakara: each member has contributed 5 bags of paddy in 2017/18 season and the same will continue in the following seasons. From such contributions, the group has managed to purchase a plot for construction of own warehouse to address the problem of conflicts between the group and village leadership over use and ownership of the existing storage facilities.

The proposed model puts emphasis on the use of new and existing platforms for collective marketing, such as the EAGC G-SOKO platform. The Eastern Africa Grain Council facilitates regional and national trade in grain using a network of village aggregation/grain bulking centres (VACs) linked to certified warehouses. G-SOKO comprises a network of village aggregation/grain bulking centres (VACs) linked to certified warehouses installed with a software automating the grain intake and grain warehousing and management process connected to a virtual trading platform with a clearing and settlement process, all regulated and administered by EAGC, under the law of contract and operating under defined set of protocols, procedures, rules and regulations. Table 26 shows examples of certified warehouses that benefit from the G-SOKO platform. The platform has adopted the EAC quality specifications for different grains as given in Appendix 4.

Table 26: Examples of G-SOKO certified warehouses in Tanzania

Name	District/Location	Capacity (MT)
Kibaigwa Flour Supplies Ltd	Kibaigwa	1000
Magozi	Ilolo	3000
Tungamalenga	Iringa Rural	850
G2L Company Ltd	Makambako	1000
Motombaya AMCOS	Mbarali	3700
Unyiha Associates Ltd	Mbozi	1000
Mtazamo Warehouse 2	Songea	800
Musoma Food Co. Ltd	Shinyanga	200
Union Service Stores Ltd	Moshi	2000

The multifunctional nature of the proposed WRS will also enable depositors to process their crops before selling to buyers and therefore add value to their crops. Just as important, the model will also help overcoming the drawback with NGO-sponsored inventory credit (warrantage) systems with regards to sustainability as it will foster a warehousing scheme that strengthens both horizontal (capital financing and aggregation) and vertical (linkage to markets). A similar ring-fencing model for proceeds of agricultural sales, funded by the private

sector has worked well in Zimbabwe, especially for tobacco, and to some extent cotton.[59] The proposed model will develop trust among actors through the use of robust certification, licensing and inspection systems while at the same time enhancing trust with financial institutions. Farmers will be able to use their infrastructure as bank security and trust with banks will be enhanced. Every financial institution looks for some reasonable assurance in source of repayment for any financing as part of the risk mitigation measures during credit assessment. Risk on lending increases when there is no security or collateral as a fall back in case of default. Ring-fencing the investment and operation of WRS can serve as a risk mitigated lending product line for financial institutions and will assist most farmers to access credit for both investment in group owned warehouse infrastructure and financing farm activities and household expenditure, while waiting for better prices on the market. Equality important on the side of producers or depositors is the existence of reliable and structured market for their deposited commodity. The financial institutions will also have reasonable assurance of recovery prospects through this structured market and hence increase their exposure to the sector.

The financial institutions will be attracted to extend credit to depositors of commodities through their groups, AMCOs or farmers' organizations or apex bodies who will serve as collateral managers, having custody of the commodity and manage the same, until the commodity is sold through the market and proceeds paid through the institution concerned. By virtue of having commodity that is tied to a reputable and structured market, the financial institution will be assured that either way, prospects of loan recovery are high. More so with the fact that such facilities are already discounted – the margin taking care of interest costs and price fluctuations on the commodity.

Participating banks will work with farmers groups, AMCOs or organizations to develop specifications for forward contracts, in which case, depositors taking up forward contracts could require short-term financing, awaiting delivery of their contract and settlement of the same. The banks will extend financial assistance to commodity depositors through their groups, AMCOS or organization against pledge of agricultural commodities.

The financial service providers would benefit not only in terms of increased assurance in source of repayment but also by having an increased number of new clients on their books, increased deposits from proceeds from sales, increased loan book and exposure to sector that drives the economy of the country, as well as goodwill for supporting an otherwise marginalized section of the economy (the smallholder farmers) through a strategic financial inclusion endeavour.

The model is also suitable for use in the commodity exchange market where buyers will be required to deposit their money in a settlement account before participating in a trade. However, this might not be possible with international trade which is usually the main target of the exchange. International trades are often sponsored by the vehicle of Letters of Credit which is not an immediate payment. Meanwhile, the exchange will need to pay the depositor

[59] https://www.pressreader.com/zimbabwe/the-herald-zimbabwe/20150923/281487865152364

immediately. The parties will discuss a possibility of participating Bank to create a product from which the exchange members could tape to settle trades that are paid through Letters of Credit and other related forms of payment. The purpose of this facility will be to provide liquidity through a financial structure that, in addition to the creditworthiness of the buying client, is based on the contractual obligations of the end buyers, whose creditworthiness and commitments through an irrevocable letter of credit provides additional collateral. The key characteristic of the model is that the exposure of the lenders to the general commercial risks associated with the borrower is mitigated by the lenders taking security over cash flows due to the borrower under confined orders from pre-agreed off-takers under export contracts.

8. CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS FOR POLICY MAKING

8.1 Conclusion

Overall, the performance of WRS in Tanzania was ranked as moderate but facing several operational bottlenecks, including: a) the lack of appropriate WRS infrastructure (e.g. suitable warehouses, state of the art facilities and equipment, agro-processing mills, and year-round passable feeder loads); b) inadequate financing, cumbersome and long lending procedure characterized by high interest rates: the lending priority for most banks is not to smallholder farmers; c) unreliable markets, volatility in producer prices and regular bans in grain exports; d) high operational and transaction costs; e) lack of awareness and poor understanding of WRS (farmers were not effectively consulted and informed of the system); and political interference as well as conflicting interests between village leaders and farmer groups over WRS infrastructure. In addition, the main regulator (WRRB) lacks the resources to effectively conduct its full range of regulatory functions.

WRS was introduced prematurely as many stakeholders, especially the smallholder farmers were not well informed of not only the system itself but also the requirements, costs and benefits associated with its operation. In addition, the lack of a reliable markets and volatility of producer prices had discouraged smallholder farmers to engage in effective WRS operation. WRS operators faced stiff completion from mushrooming warehouses in rural areas which are owned and run by private individuals most of whom being informal operators less or not regulated by any official institutions.

Overall, the unreliability of markets, especially the limited number of buyers, makes it difficult for smallholder farmers to generously benefit from WRS. NFRA, for example has operated as a major buyer of grains in many parts (e.g. in Mbozi District), but farmers complained about the lower producer prices offered by the agency – NFRA prices were often lower than that offered by private traders who exported maize to neighbouring countries. This has particular implication especially when the government imposes export bans in grains: the producer prices and income decline substantially. In this way, farmers have been subsidizing food security for consumers in Tanzania. The producer prices for grains have been fluctuating and becoming unpredictable making it difficult for farmers to determine the right time for deposited crops to be sold. In general the operation of WRS in the traditional food crops (e.g. rice, maize and other grains) has been more challenging than in cash crops (e.g. coffee, cashew nuts etc), partly because the traditional food crops lack independent crop boards as compared to traditional cash crops like coffee where the commodity outlet is largely through the board making it easier for the bank to channel the loans through the boards. The Cereals and Other Produce Board of Tanzania (CPB) is not known by many stakeholders, especially the smallholder farmers. This notwithstanding however many smallholder farmers have continued to operate some own forms of WRS and collective marketing systems, though not very formal (i.e. not licensed by WRRB).

8.2 Recommendations and Implications for Policy Making

Based on the study findings and discussion presented in the previous sections, the following key recommendations and implications for stakeholders and policy making are drawn:

a) Since many smallholder groups, like AMCOS and farmers' associations, lack the financial resources to own and operate their own storage facilities, they need support that will enable them engage in sustainable WRS operation. A sustainable WRS will require investment in key infrastructure that entails provision of multifunctional units (e.g. suitable storage, sorting, grading and processing facilities) that enable them to aggregate huge volume of grains, process and sell it through a collective marketing system.[60] Banks and institutions like the newly formed PSSSF (Public Service Social Security Fund),[61] can be encouraged and motivated to invest in grain storage and processing infrastructures (e.g. in the construction of silos to be rented out to warehouse operators). In addition to the financial institutions that are currently financing WRS, like NMB and CRDB, other community banks, like VICOBA and SACCOS can be strengthened and used to complement the existing WRS financing institutions. The Madibira AMCOS for example, is financing not only input loans but also collective marketing of rice and has built trust among members which renders it to emerge as an active and one of the most successful SACCOS in the country.

b) In the line with preceding proposition we recommend a ring-fenced WRS-Collective marketing model which entails a tailor-made financing facility for smallholder farmers' or community/AMCOS owned storage facilities. Financing institutions, such as, NMB, CRDB, TADB, TIB and others, like PSSSF can diversify their product lines to include services that are targeted to support WRS for smallholder farmers. A "ring fencing" financing model for example, can be used to finance warehouse infrastructure and facilities for organized smallholder farmer groups, AMCOS, and farmers associations under the umbrella of their respective apex bodies, like AKIRIGO and AMBERICO in Kilombero and Mbarali Districts respectively. Some banks, e.g. NMB have already indicated interest in providing these services under condition that the applicants pledge 25% and the bank provides 75% of the total loan facility. The infrastructure constructed under this loan facility can then be hired out to licensed warehouse operators and the deposited crops sold using collective marketing arrangement. After loan repayment (usually five years for NMB) the infrastructure and associated facilities become the property of the respective farmer groups. This will enable farmers to earn revenue that will be used to expand and diversify their businesses. The idea is to instil a sense of ownership among the smallholder farmers, of not only the infrastructure and facilities but also the WRS itself by making it a smallholder sensitive and inclusive system.

[60] It is also important to invest in passable feeder roads to ensure that grains are easily collected from the farm to the storage facilities.

[61] PSSSF recently established public service social security fund formed after the merger of the PPF Pension fund, Public Service Pension Fund (PSPF), Local Authorities Pension Fund (LAPF) and Government Employees Provident Fund (GEPF)

c) The development of new product lines for WRS financing should be accompanied by the provision of training to banks and bank regulators to explain the use of commodities as collateral for lending and design of appropriate financial products and procedures; identification of business development leads among value chains through commissioning of market studies to show opportunities for lending.

d) Grain farmers should be helped to organize themselves into strong farmer groups and associations. They should be enabled to become autonomous and possess their own warehouse facilities as opposed to the current practice where the facilities are considered as belonging to the village governments and in many cases used by some political elites to embrace their power. This implies retreating from the vitality of WRS politicking which was listed as one of the key bottlenecks in the existing WRS.

e) From the evaluation of capacity utilisation in the study districts three types of storage warehouses are recommended: a) the grain collection centres which are suitable at the village level with medium-size warehouses (200 – 799 metric tons); b) large storage warehouses (with capacities of 800 – 1,999 metric tons) for AMCOS able to aggregate amount of grains falling in this range; and c) mega (very large) storage warehouses for AMCOS, like Madibira and Apex bodies, which can aggregate 2,000 or more metric tons of cereals and/or legumes per season.

f) The main WRS regulatory body in Tanzania (WRRB) is understaffed and ill-equipped. It requires substantial facilitation in terms of the number of staff, financial resources, vehicles, and other resource which are necessary to enable it undertake regulatory tasks, promotion, and surveillance inspections. At the time of the study the Board had only 11 staff employed on the permanent basis and two drivers employed on contract basis. The Board has only two vehicles. The Board needs to promote the concept of WRS as many stakeholders were not aware about, its operation procedure, the associated costs and benefits. Some stakeholders, for example, did not understand why commodity samples are taken and kept after sampling: they need to be educated. The Board needs to ensure that it is widely known in the country and shifts from its current centralized form of operation (with its office only based in Dar es Salaam) and establish zonal and regional offices. In addition, WRRB should establish a unit for Research and Development. This is important to inform decision making and promotional activities by the Board. It is also important to note that private warehouse operators should be advised and encouraged to as formal entities. The study observed many private warehouses which were not regulated. It is important to note that licensing a warehouse under the WRS was not obligatory but discretionary for private operators, which render it difficult for licensed WRS operators to compete with unregulated or less regulated operators. Just as important, transportation agents under WRS were not adequately regulated which incentivized them to cheat. They should be required to have securities in transporting WRS commodities. This is important, especially for export commodities, and for building trust and maintaining the image of importers and the country at large. Above all, the Board should be enabled to create awareness, promote,

and conduct WRS advocacy activities to all stakeholders, including the smallholder farmers, warehouse owners and operators, transporters, and agribusinesses just to mention few. The development and dissemination of industry standards for cereals and legume warehouses, collateral management companies, stock monitoring companies, inspection and licensing procedures, is important. In addition, it is important to promote the use of professional collateral management services and stock monitoring services; strengthen the industry association for collateral management and stock monitoring companies; and provision of dedicated training (e.g., through an academy) and licensing/certification for warehouse operators and stock monitoring staff to ensure high professional standards and procedures that would instil trust in the system.

The operation of WRS is currently dominated by the use of unautomated systems involving too much paper works and making the system to be less efficient. The study recommends the shift from paper-based to electronic warehouse receipts, certificates of deposit, and receivables/invoices along with associated platforms in operation of WRS. In fact, there are already some steps made towards that direction. The interview with the management of WRRB indicated that the use of electronic warehouse receipts was planned to commence in May 2018. Just as important, NMB has moved far ahead in terms of automation of its WRS financing process, currently using its eKili platform for the Mount Meru Millers Tanzania Ltd and the Pyrethrum Company of Tanzania Ltd (PCT).[62] The Mount Meru Millers Tanzania Ltd is one of the biggest seed crushers in East Africa planning to increase its crush rate of seeds to produce 450,000 MT of oil and double the sunflower production to 800,000 MT and increase soybean production to 50,000 MT.[63] According to the discussion with the staff of NMB, if adopted, the automation of warehouse receipts is also likely to help address the problem of collusion between untruthful operators and depositors who cheat on weights of deposited commodity. The government has also establishment of the Tanzania Mercantile Exchange (TMX) which is a commodity exchange platform that is put in place to help various farmers to access the domestic and global markets better and obtain a fair price in selling of their produce.[64] As the country breaks through the agri-commodity export markets via the TMX platform, the digitization and automation of WRS is indispensable. This implies the shift from use of rudimentary techniques to the adoption of state of the

[62] The Pyrethrum Company of Tanzania Ltd (PCL) is a subsidiary of an international company engaged in agriculture and agro-processing business. The company promotes the growing, processing and exporting pyrethrum products.

[63] Singida factory was inaugurated by the President of Tanzania, Hon. Dr John Pombe Joseph Magufuli on 11 March 2018 (See: https://www.mountmerugroup.com/group-presence/tanzania/mount-meru-millers-tanzania-ltd/)

[64] The TMX was incorporated on 25th August 2014 under Companies Act, 2002 to perform the business of a commodity exchange in the country and has been established as a public private partnership company. The first four shareholders of the company are the Treasury Registrar, TIB Development Bank, Public Service Pension Fund (PSPF) and the Tanzania Federation of Cooperatives (TFC). The TMX was licensed by the Capital Markets and Securities Authority (CMSA) on 6th December 2016 in accordance with the COMEX Act 2015 and COMEX Regulations, 2016 (See: www.cmsa.go.tz/index.php/).

art record keeping, licensing operating technology (e.g. the use of hightec sampling tools and equipment like Carter-Day Dockage Tester and Vibration Grader to ensure that every bit of grain is sampled and graded).

g) Effective implementation of WRS needs adequate capacity building and appropriate training. It is recommended that the University agribusiness curricula should cover topics of Warehouse and WRS Management, Storage and Quality Control to produce graduates who can work as warehouse managers, warehouse quality officers, and other related careers.

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APPENDICES

Appendix 1: Terms of reference (ToR) for the study

Project: Advocacy on Warehouse Receipt System (WRS): A challenge or Opportunity to Tanzanian Smallholder Farmers

Location	SAGCOT and Northern Zones
Duration:	30 days
Starting date:	October, 2017
Ending date:	November, 2017

1.0 ABOUT ACT

Agricultural Council of Tanzania (ACT) is the agricultural private sector apex organization in Tanzania. It was established in 1999 as the Tanzania Chamber of Agriculture and Livestock (TCAL) and officially launched in 2000. It is registered as a company limited by guarantee and having no capital. In 2005, the organization changed its name to Agricultural Council of Tanzania to reflect its democratic nature and to act as a forum for free dialogue between actors.

ACT is a membership organization representing a wide spectrum of actors in the Tanzanian agricultural sector. Members include groups and associations of farmers (crops, livestock and fish producers), suppliers, processors, transporters, researchers and other stakeholders dealing in agri-business. ACT recognizes the unique challenges that the small scale farmers face as well as the medium and large agribusinesses and strives to lobby and advocate for conducive policies while proactively developing innovative and sustainable approaches for them, provide services and support to all groups to enable them move forward.

ACT has built relationships with a number of local, regional, and international organizations for the purpose of improving service delivery to its members. ACT is a member of the Tanzania Private Sector Foundation (TPSF), the umbrella private sector organization, and the Agricultural Non State Actors Forum (ANSAF). Regionally, it is affiliated to the Eastern Africa Farmers Federation (EAFF), Eastern Africa Business Council (EABC) and Southern Africa Confederation of Agricultural Unions (SACAU). Internationally, it is a member of the Royal Agricultural Society of the Commonwealth. It also enjoys partnership and collaboration with related private and public sector institutions locally, regionally and internationally.

2.0 NEED FOR THE STUDY

ACT through Tanzania Agricultural Partnership (TAP), is implementing a second phase of the programme with the Goal to contribute to improved food security and poverty reduction in rural areas through commercially oriented activities and investments. The purpose of the programme is to accelerate agricultural growth in the programme areas. In order to achieve the programme Goal, 5 strategic objectives were set i.e. *(i) increased agricultural productivity and profitability; (ii) smallholder farmers access to market improved; (iii) increased financing and investment in agriculture; (iv) increased Advocacy and Networking; (iv)Cross-cutting issues mainstreamed.*

Through the implementation of the programme, it has come to TAP's attention that in most cases the operation of the Warehouse Receipt Systems (WRS) has become a challenge, especially for smallholders in the rural areas rendering them to failure to access such services as financial services, improved agricultural inputs and good prices for their produce. Moreover the inadequate functioning of the warehouse storage facilities in the rural farmers' settings has denied them opportunities for future investments as a result of risks and uncertainties during the harvesting seasons, as they succumb to percentage losses due to poor storage and handling of produce after harvest; and hence they are forced to sell their produce at relatively lower prices. As a consequence, the incomes of smallholder farmers particularly those involved in cereal and legumes continue to diminish.

Based on these state of affairs, ACT/TAP seeks to investigate the causes for improper functioning of the Warehouse Receipt Systems in smallholder farmers in the rural areas. The study was conducted in regions where ACT/TAP is implementing its phase II programme. The results of the study is intended to be used to advise the Government on the proper models that reflect the real farmers' needs in Tanzania, and in particular the cereals and pulses subsectors, to enable them take advantage of the available opportunities in the WRS.

3.0 OVERALL OBJECTIVE OF THE STUDY

The general objective of this study is to investigate the Capacity utilization of Storage Warehouses and challenges behind the improper functioning of the Warehouse Receipt System within the Cereal and Legumes Smallholder farmers' environment.

3.1.0 SPECIFIC OBJECTIVES

i. Analyze the legal and regulatory frameworks governing the operations of the Warehouse Receipt System Vs the level of implementation on the ground, with specific emphasis on the cereals and legumes smallholder farmers' environment.
ii. Identify the number of warehouses in the selected districts, looking into whether their establishments were driven by farmers' needs, the time frame since they were established, how often they are utilized, size of the warehouse Vs the real storage volumes during on-season.

iii. Analyze the smallholder farmers' situations with respect to operational procedures of the WRS - production and income levels, organizational structures, leadership capacity, knowledge/understanding/awareness, their levels of engagement in the establishment of storage warehouses, ownership of storage facility, issues of location Vs farmers' fields (transport facilities)

iv. Assess the practical application of the WRS in comparison with Collective Marketing in smallholder farmers' environment and identify the areas where the two systems can work in synergy to come up with a system that is practical to smallholder farmers especially for cereals and pulses.

v. Identify whether there are Best Practices in WRS operations for smallholder farmers within the EAC and SADC regions with regards to Cereals and Pulses.

vi. Investigate other institutional frameworks that may be constraining the operations of WRS in smallholder farmers apart from legal and regulatory frameworks which if holistically taken care of will contribute to improvements of WRS.

vii. Based on the assessment of farmers' situation, suggest on the estimated average specifications of the storage Warehouses Appropriate for Cereals and Legumes Smallholder farmers so as to take advantage of the available opportunities.

viii. Recommend on the practical and beneficial system for cereals and pulses taking into account the situation of Tanzanian smallholder farmers.

4.0 AREAS AND COMMODITIES UNDER THE STUDY

The proposed research will be conducted in five selected Districts and their respective commodities in the SAGCOT region and Northern zone. Also three commodities have been selected for investigations, namely **Morogoro Rural** (Maize and Paddy), **Mbozi** (maize), **Mbarali** (paddy), **Kilombero** (Paddy), and **Karatu** (pigeon, maize).

5.0 DELIVERABLES/EXPECTED OUTPUTS

1. Inception Report
2. Comprehensive and well articulate report of the study
3. Policy brief for ACT to advance the advocacy work on the WRS issues.
4. A directory of stakeholders in the WRS including their contacts attached to the main report

6.0 TIME FRAME OF THE STUDY

The study will be carried out by the consultant for 30 working days.

7.0 REPORTING

The consultant will work closely with the ACT Secretariat. The report shall be submitted to the ACT Secretariat on the dates agreed in the contract. It will be reviewed by ACT and the resulting feedback and commentary will be communicated through ACT Secretariat. The draft report will be submitted as soft copy whilst the final report will be submitted as a soft copy and hard copy.

8.0 REQUIRED COMPETENCIES

The study will be commissioned to Consultant (s) affiliated to a reputable research institution or organization with vast experience in carrying out similar tasks. In this regard the Consultant (s) must have to show proven competence, professional capability and experiences in the following aspects:

a) Skills in research design and implementation, data analysis and modelling, preferably in relation to regulatory impact assessments; as well as marketing of agricultural products/Output Marketing and trade
b) Understanding of the legal and regulatory frameworks as applied in the WRS and all the key players, both business and Government
c) Knowledge of best practice in WRS regionally and internationally
d) Ability to analyze research findings to draw conclusions and make appropriate recommendations for reform
e) At least one team member or all researchers must be able to speak Kiswahili

Appendix 2: List of Consulted Individuals

Name	Position/Organization/Scheme/Place	Contacts
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Appendix 3: Interview guide

Challenges and Opportunities for Implementation of Warehouse Receipt Systems in Smallholder Agriculture

A) PARTICULARS OF ACTORS AND ECONOMIES OF SCALE

1. Type of Actors (use CODES provided below)*	
2. Name of business/firm/company/organization/ association/authority/Institution/Ministry	
3. Location (area of operation)/District/Village: 1 = Morogoro Rural (for maize and paddy) e.g. Kiroka/Milengwelengwe village; 2 = Mbozi District (for maize, common beans) AMCOS, Raphael, Senjele, BRN; 3 = Mbarali District (for paddy) e.g. Uturo, Mabadaga villages; 4 = Kilombero District (for paddy) e.g. Karturukira, Ifakara mjini; 5 = Karatu District (for pigeon peas and maize)[65]	
4. Areas of operation	
5. Year started operation	
6. Types of cereal/pulse commodities produced/stored	
7. Annual production/purchase/storage volume for each product (last season)	
8. Highest annual production/storage capacity achieved for each product	
9. Production/marketing costs/storage charge for each commodity (last season)	

Actor CODES*

Code	Type of Stakeholder	Occupation/Title/Place	Contacts
1	Farmers/Depositors		
2	Warehouse Operators		
3	Traders/Buyers		
4	Financial Institutions		
5	Regulators (Regulatory Boards, Central, Regional and Local Government)[66]		

[65] Consider cases where the storage facility is used for other/unintended commodities or uses e.g. Kambi ya Simba in Karatu District

[66] These are all government institutions, stakeholder forums which have a legal mandate to advocate, recommend, approve, and enforce issues related to policies, regulations, standards and guidelines regarding smooth operation of the WRS (*ibid*). TWLB is the main regulator. The functions of the Board are defined in section 5 of the WRS Act. The additional functions are also mentioned in Regulation 4. TWLB has patient role of promoting the system which ensure quality and quantity in receipts and delivery of the stored commodity. It also has the moral obligation to build trust among actors of the system. This shall be done by providing efficient and effective warehouse operation through safeguarding the interests of all stakeholders. Under these auspices the TWLB is the final regulator of this system. Other regulatory bodies include institutions like Crop Boards, Tanzania Bureau of Standards, Weight and

6	Warehouse Inspectors		
7	Insurance Companies[67]		
8	Transporters		
9	Suppliers		
10	Information and Communication Companies		
11	Research and Academic Institutions		
12	Donor Organizations		
13	Non-governmental Organizations		

B) LOCAL GOVERNMENT AUTHORITIES (DED, DAICO, CROP MARKETING & COOPERATIVE OFFICERS)[68]

- Ask them to provide you with the list of warehouses in the district, years of establishment, size or capacity of the warehouses – Total (Tons), utilization status, and types of warehouse financing (Community Inventory Credits, Private Warehouses, Public Warehouses), ownership of storage facilities, contacts of owners and financiers, and investment costs for public/community warehouses?
- Ask them to mention the donor or project/program that financed the construction/rehabilitation of the warehouse, if applicable (e.g. BRN, ACT/TAP, etc)
- Actual storage volumes for the last two seasons – actual storage by cereal/pulse commodities (Tons)
- Potential storage capacity/requirements or specifications for the cereals or pulse in district (based on crop production figures)
- Were the establishments of these warehouses driven by farmers' needs
- Organizational structures and leadership capacity – capacity of operators. Are the required skills available? What type of skill (s) is missing?
- Are the farmers familiar with how the WRS works?
- Are the suitable storage infrastructures available?

Measures Agency, Tanzania Food and Drugs Authority, Tanzania Revenue Authority, Tanzania Ports Authority and Tropical Pesticides Research Institute. All these institutions operate under specified laws which give them mandates to regulate specified activities that strengthen and develop WRS implementation (*ibid*).

[67] This is a legal company, agent or broker registered and regulated by Tanzania Insurance Regulatory Authority (TWLB, 2013). The main function of insurance companies in this system is to offer insurance policies to the main actors. The insurance policy in this system among others includes fire, burglary and fidelity (*ibid*).

[68] The Local, Regional and Central Government refer to the administrative government institutions established by laws and operate in the United Republic of Tanzania (*ibid*).

- Are the existing supervisory institutions strong enough to create a suitable environment in attracting key stakeholder, especially the banks?
- Levels of engagement in the establishment of storage warehouses,
- Ask them to comment on the role and performance of the **National Food Reserve Agency** (***NFRA***) or *Wakala wa Taifa wa Hifadhi ya Chakula* in their district (weaknesses, success stories and areas for improvement)[69]
- Ask them if aware of the **Cereals and Other Produce Board of Tanzania (CPB)** or *Bodi ya Nafaka na Mazao Mchanganyiko Tanzania* – ask them to provide comments about the board[70]
- What regulatory bodies are operational in the district area?
- Are the means to regulate (the terms of commodities and types of warehousing) adequately available?
- Ask them to itemize the legal and regulatory requirements or aspects and considerations for **private** and **public** warehousing. Are these requirements/considerations fulfilled? If not, why?
- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?
- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	
Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

[69] The National Food Reserve Agency (NFRA) is a public institution established as an executive agency under the Ministry of Agriculture Food Security and Cooperatives of Tanzania for the purpose of guaranteeing national food security during food shortage. The agency was established by the Executive Agencies Act No. 30 of 1997 and came into effect on 1st July 2008. It took over responsibilities of the former Strategic Grain Reserve which was established in 1976 as a strategy for overcoming food shortages in the country – following the drought of 1973 – 1975 when the country was hit by acute food shortage.

[70] CPB is an important and newly established instrument to assist farmers to fetch good and fair prices for their crops – Also acts as an incentive to increase the volume of production while keeping post-harvest losses to a minimum. The Cereal Board had begun its operation after the Act of Parliament of 2009 that give it control over the National Milling Corporation (NMC)'s former asset. The board will be taking up all initiatives with regard to promotion of contract farming and safeguarding the interests of growers

- Ask if farmers in the district practice Collective Marketing in cereals/pulses. If not what are the reasons?
- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)
- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

C) REGIONAL AND CENTRAL GOVERNMENT

- Ask them about their role/functions in regulating the implementation of WRS
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Having general mandate pertaining to all policy issues on production, marketing, taxation, construction of public Commodity and poverty alleviation		
Developing marketing systems of various commodities in Tanzania through various interventions		
Supporting the TWLB in the development of system through formal and non-formal training		
Developing, rule and enforcing other regulations and act associated with the Warehouse Receipts Act		

- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?

- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
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Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their village, district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)
- Ask them to comment on the role and performance of the **National Food Reserve Agency** (***NFRA***) or *Wakala wa Taifa wa Hifadhi ya Chakula* in their district (weaknesses, success stories and areas for improvement)
- Ask them if aware of the **Cereals and Other Produce Board of Tanzania (CPB)** or *Bodi ya Nafaka na Mazao Mchanganyiko Tanzania* – ask them to provide comments about the board
- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

D) DEPOSITORS (FARMERS)

- Ask them how many warehouses are available in their village?
- Ask them to mention the donor or project/program that financed the construction or/and rehabilitation of the warehouse, if applicable (e.g. BRN, ACT/TAP, etc)
- When was each of these warehouses established?
- Size or capacity of the warehouses – Total (Tons)
- Storage volumes for the last two seasons – actual storage by cereal/pulse commodities (Tons)
- Potential storage capacity/requirements or specifications for the cereals or pulse in the village (based on crop production figures)
- Who owns the storage facilities?
- How often do they utilize these warehouses?

- Ask them to comment on issues of warehouse location from their fields in relation to transport facilities
- Ask them about the selling prices for the last season (TZS/kg)
- Ask them about the **production costs** (per acre)
- Were the establishments of these warehouses driven by their needs?
- Ask them to specify the types of warehouse financing that are operational in the village (Community Inventory Credit, Private Warehouse, or Public Warehouse). Who are these financiers?
- Organizational structures and leadership as well as operators' capacities. Are the required skills available? What type (s) of skill (s) is (are) missing?
- Are the farmers familiar with how the system works?
- Ask about their perceptions on suitability of the available storage infrastructures?
- Are the existing supervisory institutions strong enough to create a suitable environment in attracting key stakeholder, especially the banks?
- Levels of engagement in the establishment of storage warehouses,
- What regulatory bodies are operational in the district area?
- Are the means to regulate (the terms of commodities and types of warehousing) adequately available?
- Are the farmers familiar with how the system works?
- Ask them to itemize the legal and regulatory requirements or aspects and considerations for **private** and **public** warehousing (the aim here is to evaluate their understanding of WRS and the functions of depositors).
- Are these requirements/considerations fulfilled? Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	**Bottlenecks/Constraints/Problems**	**Proposed actions**
Collection, winnowing, drying, sorting, cleaning, primary grading and packaging according to approved standards		
Signing Form 16 obtained from the Warehouse Operator		
Transportation of the commodity to the Licensed Warehouse with the support of legal document such as Produce Delivery Note		
Observing all steps in quality certification, weighing and staking of the commodity		
Check the correctness of the issued document (Quality Certificate, Commodity Received Note and Warehouse Receipts) after the commodity has been received by the warehouse operator		
Agreeing on the content of the written Warehouse Receipts and sign therein Submit the Certificate of Pledge to the Financing Institution - in the event when finance is made against the stocks		
Looking for market, buyer and selling the		

deposited commodity as per Warehouse Receipts description (a final decision maker of where to sale the commodity)		
Providing bank account details to the buyer for which the money of the bought commodity should be paid for		
Paying Warehouse Operator's lien and other charges as approved by the TWLB and all levies and taxes		
Agreeing and complying to Warehouse operator's order to remove the commodity from the warehouse		
Being the custodian of the Warehouse Receipts (Certificate of Title and Certificate of Pledge) before selling		

- Ask them to itemize compliance requirements and the associated costs
- Ask about perceptions of their situation as smallholders farmers (in terms of production and income levels)
- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?
- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	
Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Ask them if they practice Collective Marketing in cereals/pulses. If not what are the reasons?
- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their village, district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)

- Ask them to comment on the role and performance of the **National Food Reserve Agency** (***NFRA***) or *Wakala wa Taifa wa Hifadhi ya Chakula* in their district (weaknesses, success stories and areas for improvement)
- Ask them if aware of the **Cereals and Other Produce Board of Tanzania (CPB)** or *Bodi ya Nafaka na Mazao Mchanganyiko Tanzania* – ask them to provide comments about the board
- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

E) FINANCIERS/FINANCIAL INSTITUTIONS[71]

- Ask them about their role/functions as main actors in the implementation of WRS
- Ask them about their experiences with financing of storage of cereal and/or pulse commodities in their areas (including the functionality of collateral registers, priority over competing creditors, registration times/delays)
- Ask them to itemize the legal and regulatory requirements or aspects and considerations for financing storage of cereal/pulse commodities
- Ask them to itemize compliance requirements and costs that they incur in complying with these requirements
- What are the existing bottlenecks, constraints and problems in performing their WRS functions as given in the following table? (Such as financial impediments to taking security, issues related to registration fees that discourage financiers to enter into secured financial arrangement or security regime)?

Function	Bottlenecks/Constraints/Problems	Proposed action
Being a payment point for all financial transactions made under WRS (in any case cash payment is strictly prohibited)		
Financing commodity trade under the system: The finance can be made to depositor, buyer, warehouse owner and warehouse operator by considering the particular nature of the business in question		
Providing training on procedure and requirement for any financing facility under this system		
Providing information to the Board as may be demanded from time to time		

- Ask them about their near term (low hanging fruits) and further storage financing initiatives – if any. What innovations that they seek (as financiers and specialist service providers – collateral managers) to develop new lending opportunities in the development of cereal and pulse value chains in the country

[71] The financial institution referred under this system, is any institution which is licensed by the Bank of Tanzania or Registrar of Cooperatives (TWLB, 2013).

- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	
Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Ask them to propose areas for improvement (modifications) in financing of storage of cereal/pulse commodities in Tanzania

F) WAREHOUSE OPERATORS

- Ask them about their role/functions as main actors in the implementation of WRS (the aim is to evaluate their understanding of the requirements for warehouse operators)
- Ask them about warehouse investment and operating costs
- Ask them to itemize compliance requirements (securing license for warehouse operation) and the associated costs and charges (e.g. fees, levies and taxes)
- Ask them about the storage charges (TZS/bag/season)
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	**Bottlenecks/Constraints/Problems**	**Proposed action**
Securing License for Warehouse Operation		
Certifying grading of the commodity before weighing		
Weighing the commodity		
Tallying the number of package		
Receiving, storing, and delivering the commodity as per Warehouse Receipts without discrimination		
Separating the commodity covered by each owner unless stated otherwise		
Displaying approved schedule of charges for services		
Ensuring the quality and quantity of the stored commodity is preserved during the time of storage		
Preparing all documents as required by the law		
Keeping in a secured place a complete and accurate set of all records and accounts for all		

transactions pertaining to the respective commodity in which Warehouse Receipts was issued		
Paying all fees, levies and taxes to the TWLB, local and central governments respectively		
Before license, filing with TWLB a bond of equivalent amount as may be prescribed by TWLB		

- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?
- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	
Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their village, district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)
- Ask them to comment on the role and performance of the **National Food Reserve Agency** (***NFRA***) or *Wakala wa Taifa wa Hifadhi ya Chakula* in their district (weaknesses, success stories and areas for improvement)
- Ask them if aware of the **Cereals and Other Produce Board of Tanzania (CPB)** or *Bodi ya Nafaka na Mazao Mchanganyiko Tanzania* – ask them to provide comments about the board
- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

G) TRADERS/BUYERS[72]

- Ask them about their role/functions as main actors in the implementation of WRS (the aim is to evaluate their understanding of the requirements for traders/buyers)
- Ask them about investment/capital costs, if any, plus the operating costs (e.g. payment of the warehouse operator's lien)
- Ask them to itemize compliance requirements (paying the different statutory charges as approved by the TWLB) and the associated costs and charges (e.g. fees, levies and taxes, if any)
- Ask them about buying and selling prices for the last season (TZS/kg)
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Agreeing on the content of the written Warehouse Receipts		
Making payment of the commodity purchased		
Acquiring Certificate of Title and Pledge from the depositor or agent		
Collecting the Certificate of Pledge and Release Warrant from the Financing Institution - in the event when finance was made against the commodity		
Submitting the supporting document of Release Warrant, Warehouse Receipts and Delivery Order to the Licensed Warehouse Operator		
Observing all steps in tallying, loading, weighing, quality verification upon receiving the respective commodity		
Checking the correctness of the issued document (Quality Certificate and Commodity Delivery Note) after the commodity has been delivered by the warehouse operator		
Paying the Warehouse Operator's lien and other statutory charges as approved by the TWLB		
Agreeing and complying with warehouse operator's order to remove the commodity from the warehouse		
Being the custodian of the Warehouse Receipts (Certificate of Title and Certificate of Pledge) after buying		

[72] According to TWLB (2013), a buyer is any licensed company, legal person who gives an offer and accept to purchase (contract) the commodity in the Licensed Warehouse. The offer should be issued through sales catalogue which is usually prepared by the Depositor or agent, whereas offer to purchase is done by the buyer who ultimately receives sales invoice of the referred commodity. Any buyer who holds outstanding Warehouse Receipts is the incumbent depositor of the respective commodity and has all proprietor's right. Before any Buyer is allowed to participate under WRS, s/he is required to fill in Form number 16 (*ibid*).

- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?
- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	
Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their village, district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)
- Ask them to comment on the role and performance of the **National Food Reserve Agency** (***NFRA***) or *Wakala wa Taifa wa Hifadhi ya Chakula* in their district (weaknesses, success stories and areas for improvement)
- Ask them if aware of the **Cereals and Other Produce Board of Tanzania (CPB)** or *Bodi ya Nafaka na Mazao Mchanganyiko Tanzania* – ask them to provide comments about the board (bottlenecks and proposed improvements)

Function	**Bottlenecks/Constraints/Problems**	**Proposed action**
Setting the main backbone of the marketing systems and its channels for the specific crop		
Giving no objection to the implementation of Warehouse Receipts System		
Ascertaining the compliance of the Warehouse Operators on quality of crops certification		
Verifying quality to buyer		
Arbitrating in case of dispute between buyer and seller		

- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

H) WAREHOUSE INSPECTORS[73]

- Ask them about their role/functions as facilitators of WRS (the aim is to evaluate their understanding of the roles)
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Assessment of the status of warehouse for which the license has been applied about its suitability for receiving, storing, delivering of commodity		
Inspection of all relevant documents with regards to the license of warehouse, warehouse operator, warehouse receipts, agreement and any document which may be necessary for compliance to the act, Regulations and Board's guidelines		
Advising on the appropriate measures required to rectify any established anomalies		
Advising the TWLB on all issues pertaining to warehouse business and operations		
Reporting to the TWLB on the progress of any assignment as per the terms of references which are provided by the TWLB		

- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?
- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	

[73] The Warehouse Inspector is a staff who is appointed or licensed legal person or company by the TWLB for the purpose of observing the receiving, storing, conditioning, shipping and handling of commodities. He is also responsible to inspect Warehouse, stored commodity, property and records used in the system (*ibid*).

Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their village, district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)
- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

I) TRANSPORTERS[74]

- Ask them about their role/functions as facilitators of WRS (the aim is to evaluate their understanding of the requirements for transporters)
- Ask them about investment/capital costs, if any, plus the operating costs
- Ask them to itemize compliance requirements and the associated costs and charges (e.g. fees, levies and taxes, if any)
- Ask them about their service charges for the last season (TZS/kg or TZS/bag – specify the weight par bag)
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Transferring commodity to the specified point		
Ensuring that all documents which are required for the movement of the commodity are dully and correctly filled by the owner of the commodity		
Ensuring security and safety of the commodity while on transit		
Delivering the commodity at the destination point whole and in good condition as was at the time of loading		
Observing all law and regulations governing transportation of commodities and all instructions from the warehouse operators		

[74] Is an institution or any person who owns a truck(s) or has the capacity to hire it, desire with ability and capacity to transfer commodity from the aggregation point(s) to the licensed warehouse and from the licensed warehouse to the buyer's delivery point(s) (*ibid*).

- What are their views regarding the role of government in WRS (supportive or otherwise?). Has politicking contributed to the distortion of the performance of WRS, for example, by allowing inclusion of personal interests for personal gains at their expenses? Has the government or political interference caused the WRS to be inefficient and less effective? If yes why?
- What is their overall assessment of the WRS/Operation procedures?

Criteria	**Performance ranks**: 0 = not operating at all; 1 = very poor; 2 = Poor; 3 = Moderate 4 = Good; 5 = Very Good
Administration	
Licensing and oversight of warehouses	
Performance guarantees for warehouses	
Contractual rights and obligations of the parties	
Warehouse receipt (legal status, content, form and registration)	
Negotiation and transfer of warehouse receipts	
Settlement and release of stored commodities	
Execution and priority obligations	
Offences and penalties	

- Focusing on cereals and pulses, ask them to mention any Success stories or Best Practices in WRS operation for smallholder farmers in their village, district or other places in Tanzania or even other EAC and SADC countries, if any. What are the key success factors?
- Ask them to mention the legal and regulatory requirements which hinder the smooth operation of WRS in their district (ask them to provide detailed explanation)
- Ask them to mention any other institutional factors that may be constraining the operations of WRS by smallholder farmers apart from the legal and regulatory frameworks (ask them to provide detailed explanation)
- Ask them to comment on the role and performance of the **National Food Reserve Agency** (***NFRA***) or *Wakala wa Taifa wa Hifadhi ya Chakula* in their area of operation (weaknesses, success stories and areas for improvement)
- Ask them if aware of the **Cereals and Other Produce Board of Tanzania (CPB)** or *Bodi ya Nafaka na Mazao Mchanganyiko Tanzania* – ask them to provide comments about the board (bottlenecks and proposed improvements)

Function	**Bottlenecks/Constraints/Problems**	**Proposed action**
Setting the main backbone of the marketing systems and its channels for the specific crop		
Giving no objection to the implementation of Warehouse Receipts System		
Ascertaining the compliance of the Warehouse Operators on quality of crops certification		
Verifying quality to buyer		
Arbitrating in case of dispute between buyer and seller		

- Ask them to propose areas for improvement (modifications) in the existing WRS for cereals and pulses in the country.

J) TANZANIA BUREAU OF STANDARDS (TBS)[75]

- Ask them about their role/functions in regulating the implementation of WRS
- Ask them about their service charges, if any
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Preparation, framing, modifying or amending National Standards of commodity		
Undertaking measures for quality control of commodities, services and environment of all descriptions and to promote standardization in industry and trade		

K) WEIGHTS AND MEASURES AGENCY (WMA)[76]

- Ask them about their role/functions in regulating the implementation of WRS
- Ask them about their service charges, if any
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Protecting consumers in trade, health, safety and environment in relation to weights and measures		
Controlling pre-packaging of products		

[75] TBS is mandated to undertake measures for quality control for products of all descriptions and to promote standardization in industry and commerce (*ibid*).

[76] WMA is a law enforcement agency that ensures all traders in weights and measures comply with the requirements of the Weights and Measures Act. (Cap 340) - in order to protect consumers against malpractices. Thus the Mandate of WMA is to verify and re-verify all weights, measures, weighing or measuring instruments used or intended to be used for trade in Tanzania Mainland.

L) TANZANIA REVENUE AUTHORITY

- Ask them about their role/functions in the implementation of WRS
- Ask them about their service charges, taxes, levies, etc
- Ask them to mention the bottlenecks, constraints and problems facing them when implementing different functions as required by WRS, and propose actions to address these issues

Function	Bottlenecks/Constraints/Problems	Proposed action
Administering Value Added Tax (VAT) on service provided by warehouse operators		
Charging Service Development Levy (SDL) on gross salaries and wages of the warehouse operators employees		
Charging Withholding Tax on rent of the warehouses		
Administering Stamp Duty of the annual rent of the lease agreement of the warehouses		
Charging Corporate Tax on the trading profit of the warehouse operation		

NOTE: The stakeholders are also obliged to pay all statutory levies, fees and charges which are legally imposed, including the Local government/municipal Service Levy of the annual turnover of the warehouse operation.

M) **CONSIDER OTHER STAKEHOLDERS:** Example: Communication Companies (e.g. Katurukira where ICT is used at the level of aggregation of inputs and planning output marketing), TFRF (Tanzania Fire & Rescue Force)

Appendix 4: EAC standards used by the EGCs G-SOKO platform

a) Specifications for maize

S/N	Characteristics	Maximum limits			Method of test
		Grade1	Grade2	Grade3	
i)	Foreign matter, %m/m	0.5	1	1.5	ISO605
ii)	Inorganic matter, %m/m	0.25	0.5	0.75	
iii)	Broken kernels, %m/m	2	4	6	
iv)	Pest damaged grains, %m/m	1	3	5	
v)	Rotten and diseased grains, %m/m	2	4	5	
vi)	Discolored grains, %m/m	0.5	1	1.5	
vii)	Moisture, %m/m	13.5			ISO711/712
viii)	Immature/shrivelled grains, %m/m	1	2	3	ISO605
ix)	Filth, %m/m	0.1			
x)	Total defective grains, %m/m	3.2	7	8.5	ISO605
xi)	Total aflatoxin (AFB1+AFB2+AFG1 +AFG2), ppb	10			ISO16050
xii)	Aflatoxin B1, ppb	5			
xiii)	Fumonisin, ppm	**2**			AOAC 2001.04

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70% of the sum total of individual defects.

b) Specifications for milled rice

S/N	Characteristics	Maximum limits			Method of test
		Grade1	Grade2	Grade3	
	Broken, %	5	15	25	ISO 605
	Heat damaged rice, %	1	1.5	2	
	Damaged rice, %	1.5	2	3	
	Chalky, %	2	4	10	
	Red or red streaked, %	2	6	12	
	Immature grains, %	1	1.5	2	
	Other contrasting varieties, %	1	2	3	
	Organic matter, %	0.1	0.2	0.5	
	Inorganic matter, %	0.1			
	Paddy grains, %	0.3			
	Live weevils in kg	Nil			
	Filth, %	0.1			
	Moisture content, %	14			ISO 711/ISO 712
	Total aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb	10			ISO 16050
	Aflatoxin B1, ppb	5			
	Fumonisin, ppm	2			AOAC 2001.04

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70 % of the sum total of individual defects.

c) Specifications for dry beans

S/N	Characteristics	Maximum limits			Method of test
		Grade1	Grade2	Grade3	
i)	Foreign matter, %m/m	0.5	0.75	1	ISO605
ii)	Inorganic matter, %m/m	0.1	0.2	0.3	
iii)	Other edible grains, %m/m	0.1	0.2	0.5	
iv)	Pest damaged grains, %m/m	1	2	3	
v)	Heat damaged grains, %m/m	0.1	0.2	0.5	
vi)	Contrasting varieties, %m/m	0.5	1	1.5	
vii)	Broken/split, %m/m	1	2	3	
viii)	Discoloured, %m/m	1			
ix)	Total defectives grains, %m/m	2	3.5	5.5	
x)	Filth, %m/m	0.1			
xi)	Moisture, %m/m	14			ISO24557
xii)	Total aflatoxin (AFB1+AFB2+AFG1 +AFG2), ppb	10			ISO16050
xiii)	Aflatoxin B1, ppb	5			
xiv)	Fumonisin, ppm	2			AOAC 2001.04

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70% of the sum total of individual defects.

d) Specifications for dry soybeans

S/N	Characteristics	Maximum limits			Method of test
		Grade1	Grade2	Grade3	
i)	Moisture, % m/m	14			ISO 711/ ISO 712
ii)	Test weight, kg/h (g/0.5L) min.	70(357)	68(347)	66(337)	ISO 605
iii)	Foreign matter, % m/m	1	2	3	
iv)	Inorganic matter, % m/m	0.1	0.3	0.5	
v)	Broken/split grains, % m/m	1	2.5	5	
vi)	Pest damaged grains, % m/m	0.3	0.8	1.5	
vii)	Rotten and diseased grains, % m/m	0.2	0.5	1	
viii)	Heat damaged grains %m/m	0.1	0.2	0.5	
ix)	Contrasting colours, % m/m	2	3	5	
x)	Immature/shrivelled grains, % m/m	0.1	0.2	0.5	
xi)	Filth, % m/m	0.1			
xii)	Total defective grains, % m/m	2	3	5	
xiii)	Total aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb max	10			ISO 16050
xiv)	Aflatoxin B1, ppb max	5			
xv)	Fumonisin, ppm max	2			AOAC 2001.04

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70% of the sum total of individual defects

e) Specifications for green grams

S/N	Characteristics		Maximum limits			Method of test
			Grade1	Grade2	Grade3	
i)	Moisture, % m/m max.		14			ISO 24557
ii)	Size grading, % m/m min.		98	98	n/a	
iii)	Purity, % m/m min.		99			
iv)	Defective, % m/m max		2	4	6	
v)	Immature grain, % m/m max.		2	3	4	
vi)	Contrasting classes, % m/m max.		0.5	1	2	
vii)	Classes that blend, % m/m max.		5	10	15	
viii)	Germination, % max. (excluding hard seeds)		90	n/a	n/a	
ix)	Sprout test		Suitable	n/a	n/a	ISO 605
x)	Foreign material, % m/m max	Organic	0.65			
		Inorganic	0.25			
		Filth	0.1			
xi)	Other edible grains, % m/m max. (any edible grains including oilseeds other than green grams)		0.1	0.5	3	
xii)	Insect/pest damaged, % m/m max. (grains per cent by count clean-cut weevil bored)		1	2	3	
xiii)	Total aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb max.		10			ISO 16050
xiv)	Aflatoxin B1, ppb max		5			
xv)	Fumonisin, ppm max.		2			AOAC 2001.04

f) Specifications for cow peas

S/N	Characteristics	Maximum limits			Method of test
		Grade1	Grade2	Grade3	
i)	Foreign matter, % m/m	0.2	0.6	1	ISO 605
ii)	Inorganic matter, % m/m	0.1	0.5	0.75	
iii)	Broken/split grains, % m/m	1	2	3	
iv)	Pest damaged grains, % m/m	2	3	6	
v)	Rotten and diseased grains, % m/m	0.5	0.5	1	
vi)	Discoloured grains, % m/m	1	1	3	
vii)	Immature/shrivelled grains, % m/m	1	2	3	
viii)	Filth, % m/m	0.1			
ix)	Total defective grains, % m/m	2	4	5	
x)	Moisture, % m/m	14			ISO 24557
xi)	Total Aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb	10			ISO 16050
xii)	Aflatoxin B1, ppb	5			
xiii)	Fumonisin, ppm	2			AOAC 2001.04

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70 % of the sum total of individual defects.

g) Specifications for chicken peas

S/N	Characteristics		Maximum limits			Method of test
			Grade1	Grade2	Grade3	
i)	Moisture, % m/m max.		14			ISO 24557
ii)	Size grading, % m/m min.		98	98	n/a	
iii)	Purity, % m/m min.		99			
iv)	Defective, % m/m max		2	4	6	
v)	Immature grain, % m/m max.		2	3	4	
vi)	Contrasting classes, % m/m max.		0.5	1	2	
vii)	Classes that blend, % m/m max.		5	10	15	
viii)	Germination, % max. (excluding hard seeds)		90	n/a	n/a	
ix)	Sprout test		Suitable	n/a	n/a	
x)	Foreign material, % m/m max	Organic	0.65			
		inorganic	0.25			
		Filth	0.1			
xi)	Other edible grains, % m/m max. (any edible grains including oilseeds other than green grams)		0.1	0.5	3	ISO 605
xii)	Inset /pest damaged, % m/m max. (grains per cent by count clean-cut weevil bored)		1	2	3	
xiii)	Total aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb max.		10			ISO 16050
xiv)	Aflatoxin B1, ppb max		5			
xv)	Fumonisin, ppm max.		2			AOAC 2001.04

h) Specifications for pigeon peas

S/N	Characteristics	Maximum limits			Method of test
		Grade1	Grade2	Grade3	
i)	Foreign matter, % m/m	0.5	1	2	ISO 605
ii)	Inorganic matter, % m/m	0.1	0.5	0.7	
iii)	Broken/split grains, % m/m	2	3	4	
iv)	Pest damaged grains, % m/m	2	3	6	
v)	Rotten and diseased grains, % m/m	0.5	0.5	1	
vi)	Discoloured grains, % m/m	1	1	3	
vii)	Immature/shrivelled grains, % m/m	1	2	3	
viii)	Filth, % m/m	0.1			
ix)	Total defective grains, % m/m	3	5	8	
x)	Moisture, % m/m	14			ISO 24557
xi)	Total Aflatoxin (AFB1+AFB2+AFG1+AFG2), ppb	10			ISO 16050
xii)	Aflatoxin B1, ppb	5			
xiii)	Fumonisin, ppm	2			AOAC 2001.04

NOTE: The parameter, Total defective grains is not the sum total of the individual defects. It is limited to 70 % of the sum total of individual defects.

Appendix 5: Warehouse storage capacity in Kilombero District

No	Name of owner	Status	Condition	Crops stored	Ownership	Capacity (T)
1	Gastor Kimario	Operational	Fair	Paddy	Private	40
2	Hamisi Ngangile	Operational	Fair	Paddy	Private	250
3	Mutuka Munene	Operational	Fair	Paddy	Private	50
4	Vitus Njiku	Operational	Fair	Paddy	Private	200
5	Masudi Minduson	Operational	Fair	Paddy	Private	50
6	Nyalibeshi Wilbert	Operational	Fair	Paddy	Private	600
7	Frigill Mario (Kiwi)	Operational	Fair	Paddy	Private	200
8	Salim Kanyanza	Operational	Fair	Paddy	Private	50
9	Jibeha Fimbo	Operational	Fair	Paddy	Private	1800
10	Matonela Abdalah (Mato)	Operational	Fair	Paddy	Private	1500
11	Buzelengule	Operational	Fair	Paddy	Private	700
12	Jumanne K. Lumande	Operational	Fair	Paddy	Private	400
13	J.Bengesi	Operational	Fair	Paddy	Private	150
14	Mbamba Rice	Operational	Fair	Paddy	Private	50
15	Kwatisa	Operational	Fair	Paddy	Private	100
16	Bakari A. Namapata	Operational	Fair	Paddy	Private	80
17	Kyalumbe Galilaya	Operational	Fair	Paddy	Private	80
18	Rahely Mohamed (Umoja)	Operational	Fair	Paddy	Private	150
19	Thomas Shayo (T.K)	Operational	Fair	Paddy	Private	100
20	Peter Shirima	Operational	Fair	Paddy	Private	60
21	Imma Mahenge (Angola)	Operational	Fair	Paddy	Private	50
22	Mpaji Mungu	Operational	Fair	Paddy	Private	40
23	Cosmas Luhendo (Nazrt)	Operational	Fair	Paddy	Private	100
24	Vedasto Kahungu	Operational	Fair	Paddy	Private	200
25	Mohamed Matuwila (Mach)	Operational	Fair	Paddy	Private	350
26	JULI NGAHAPA (2 WRS)	Operational	Fair	Paddy	Private	250
27	Gabriel Martin (Bichwa)	Operational	Fair	Paddy	Private	100
28	hashim Mtalam	Operational	Fair	Paddy	Private	30
29	Omary Rajab (Mandela)	Operational	Fair	Paddy	Private	50
30	Ephrasia Lugaela	Operational	Fair	Paddy	Private	100
31	Goodmorning	Operational	Fair	Paddy	Private	40
32	Exavel Lwambano (Tland)	Operational	Fair	Paddy	Private	40
33	Michael Mziray	Operational	Fair	Paddy	Private	100
34	Awazi Jalala (Dikky)	Operational	Fair	Paddy	Private	30
35	Jugilo Tanda (Kigoma RM)	Operational	Fair	Paddy	Private	100
36	Juma mkenga (Urafiki)	Operational	Fair	Paddy	Private	150
37	James J. Makwaya	Operational	Fair	Paddy	Private	150
38	Ngowi makenya	Operational	Fair	Paddy	Private	60
39	Muya Msulwa	Operational	Fair	Paddy	Private	50
40	Victor Mayunga	Operational	Fair	Paddy	Private	250
41	Alex Mwanambogoma	Operational	Fair	Paddy	Private	70
42	Ndelema Lucas	Operational	Fair	Paddy	Private	100
43	Abdalah Said (Bembea)	Operational	Fair	Paddy	Private	80
44	Maduki sozzi	Operational	Fair	Paddy	Private	400

No	Name of owner	Status	Condition	Crops stored	Ownership	Capacity (T)
45	Hassan Y. Ndembo	Operational	Fair	Paddy	Private	50
46	Victoria A. Swai	Operational	Fair	Paddy	Private	50
47	Shahadra John	Operational	Fair	Paddy	Private	100
48	NABILI NIZARI	Operational	Fair	Paddy	Private	40
49	Hassan Amiri (Obama)	Operational	Fair	Paddy	Private	200
50	Amani Suleiman (Bonge)	Operational	Fair	Paddy	Private	100
51	BOZINIA	Operational	Fair	Paddy	Private	20
52	ESTONIA RICE MILL	Operational	Fair	Paddy	Private	100
53	Said Mishiko	Operational	Fair	Paddy	Private	100
54	Ally M. Rashid	Operational	Fair	Paddy	Private	50
55	Carolina Ngoja	Operational	Fair	Paddy	Private	20
56	Christopher	Operational	Fair	Paddy	Private	20
57	Kilian Ndowo Shukuru	Operational	Fair	Paddy	Private	70
58	Masanja Aloyce	Operational	Fair	Paddy	Private	30
59	Godfrey Maliyatabu	Operational	Fair	Paddy	Private	500
60	Dismas Mpwehuka	Operational	Fair	Paddy	Private	50
61	Fadhili Sudi	Operational	Fair	Paddy	Private	10
62	Chivingo Chipa	Operational	Fair	Paddy	Private	100
63	Vijana Mbassa	Operational	Fair	Paddy	Private	70
64	Peter Nkombe (Kubilu)	Operational	Fair	Paddy	Private	30
65	Bethelehemu Centre	Operational	Fair	Paddy	Private	20
66	Mohamed Henji (Nyambi)	Operational	Fair	Paddy	Private	50
67	Levin Matikila	Operational	Fair	Paddy	Private	70
68	Mohamed Henji	Operational	Fair	Paddy	Private	150
69	White Rice	Operational	Good	Paddy	Private	300
70	Nalioto Abdalah	Operational	Fair	Paddy	Private	50
71	Severine Mtenga	Operational	Fair	Paddy	Private	60
72	Omari Matale	Operational	Fair	Paddy	Private	20
73	Dani Munishi (Machame)	Operational	Fair	Paddy	Private	300
74	Mustafa J. Bendera	Operational	Fair	Paddy	Private	160
75	Mohamed A. Mlango	Operational	Fair	Paddy	Private	700
76	Amili Mhina Mnenga (Mgosi)	Operational	Fair	Paddy	Private	350
77	Rasuli O. Msuya	Operational	Fair	Paddy	Private	100
78	Mohamed A. Mlango (Mh)	Operational	Fair	Paddy	Private	50
79	Allice Mchalange	Operational	Fair	Paddy	Private	150
80	Ayubu Msuya	Operational	Fair	Paddy	Private	50
81	Nassoro Mhina	Operational	Fair	Paddy	Private	200
82	John Innocent Kapinga	Operational	Fair	Paddy	Private	80
83	Vallence John Katela	Operational	Fair	Paddy	Private	700
84	Hashimu Puyaga	Operational	Fair	Paddy	Private	50
85	Shomari Makanaki	Operational	Fair	Paddy	Private	150
86	Mbonile Sajo	Operational	Fair	Paddy	Private	500
87	Mohamed Issa	Operational	Fair	Paddy	Private	70
88	Ally Rashid Maula	Operational	Fair	Paddy	Private	50
89	Mohamed I.Mbonde	Operational	Fair	Paddy	Private	30
90	Eckfredy Expedit Malekano	Operational	Fair	Paddy	Private	700
91	Rashid Ndomondo	Operational	Fair	Paddy	Private	60

No	Name of owner	Status	Condition	Crops stored	Ownership	Capacity (T)
92	Rashid Matewele	Operational	Fair	Paddy	Private	20
93	Rashi Ngutu	Operational	Fair	Paddy	Private	110
94	Abdalah Nalioto	Operational	Fair	Paddy	Private	50
95	Beda Mwagani (Bondeni)	Operational	Fair	Paddy	Private	0
96	Kwa Mangi	Operational	Fair	Paddy	Private	100
97	Suluti Libaula	Operational	Fair	Paddy	Private	200
98	Castol Magoha	Operational	Fair	Paddy	Private	200
99	Godwin Peter Linyamala	Operational	Fair	Paddy	Private	80
100	Haroon Mkindi	Operational	Fair	Paddy	Private	50
101	Rajabu Mkindu	Operational	Fair	Paddy	Private	60
102	Hemed Msuya (CCM building)	Operational	Fair	Paddy	Private	500
103	Patric Mwaulambo	Operational	Fair	Paddy	Private	100
104	Godfrey Ngoda (Near Mbay)	Operational	Fair	Paddy	Private	120
105	Charles Dastan (After Mbay)	Operational	Fair	Paddy	Private	100
106	Mohamed Said (LMC & Master)	Operational	Fair	Paddy	Private	400
107	Adam Rashid	Operational	Fair	Paddy	Private	100
108	Amon Mkangala	Operational	Fair	Paddy	Private	250
109	Khalifa Mlacha	Operational	Fair	Paddy	Private	800
110	Khalphan Alawi Mturi	Operational	Fair	Paddy	Private	200
111	Deo Mutavangwa	Operational	Fair	Paddy	Private	150
112	Rashid Ndomondo	Operational	Fair	Paddy	Private	450
113	Jose Ngailo(Jengo la CCM)	Operational	Fair	Paddy	Private	50
114	Richard Uwoya	Operational	Fair	Paddy	Private	150
115	Edwin Kayuni	Operational	Fair	Paddy	Private	50
116	Epiana Edwin Kayuni	Operational	Fair	Paddy	Private	400
117	Florence Msambila (Udzungwa)	Operational	Good	Paddy	Private	1000
118	Thadei Mkula (village warehouse)	Operational	Fair	Paddy	Private	100
119	Katurukila Farmers Assoc.	Operational	Fair	Paddy	Private	300
120	Yassin Mayati	Operational	Fair	Paddy	Private	80
121	Gaudence Magere	Operational	Fair	Paddy	Private	520
122	Salehe Nyambulila	Operational	Fair	Paddy	Private	5000
123	Niko Malongo	Operational	Fair	Paddy	Private	150
124	Wilbroad Kifigo	Operational	Fair	Paddy	Private	75
125	Feruz Nahadhi	Operational	Fair	Paddy	Private	30
126	Wilbroad Kifigo	Operational	Fair	Paddy	Private	120
127	Venance Kimaro	Operational	Fair	Paddy	Private	200
128	Freddy Laison Mwasakilale	Operational	Fair	Paddy	Private	50
129	Michael Raimond Ngowi	Operational	Fair	Paddy/Maize	Private	50
130	August Kitale	Operational	Fair	Paddy	Private	20
131	Kisoda (Mpaka Prison)	Operational	Fair	Paddy	Private	20
132	Shushu	Operational	Fair	Paddy	Private	300
133	Lucas Kiyuga (Ilula Rice Farm)	Operational	Fair	Paddy	Private	400
134	Jaji Mwaisumu	Operational	Fair	Paddy	Private	0
135	Ghala la Mokoa	Operational	Fair	Kakao	Private	150
136	Fedrick Mange	Operational	Fair	Paddy	Private	500
137	Mama Japhet	Operational	Fair	Paddy	Private	250
138	Julius. J.	Operational	Fair	Paddy	Private	1,000

No	Name of owner	Status	Condition	Crops stored	Ownership	Capacity (T)
139	Moshi Kilembe	Operational	Fair	Paddy	Private	700
140	Kanjeli Seme	Operational	Fair	Paddy	Private	100
141	Hamisi Yussufu	Operational	Fair	Paddy	Private	50
142	Moses Kalinga	Operational	Fair	Paddy	Private	200
143	Hilda Mbaruku	Operational	Fair	Paddy	Private	300
144	Deo Kikoti	Operational	Fair	Paddy	Private	150
145	Tito Ndulu (Sokoni)	Operational	Fair	Paddy	Private	200
146	Dominic Njoole	Operational	Fair	Paddy	Private	250
147	Kateule	Operational	Fair	Paddy	Private	200
148	Shija Mdee (Kwa Mngoni)	Operational	Fair	Paddy	Private	300
149	Berno Ndulu	Operational	Fair	Paddy	Private	300
150	Titus Ndulu (Mpakani)	Operational	Fair	Paddy	Private	700
151	Elias Hasara	Operational	Fair	Paddy	Private	200
152	Michael Lukindo	Operational	Fair	Paddy	Private	1500
153	Merckzedeck Masele	Operational	Fair	Paddy	Private	200
154	Exavel Lwambano (Timberland)	Operational	Fair	Paddy	Private	250
155	Mwanyika	Operational	Fair	Paddy	Private	150
156	Fadhili Rashidi	Operational	Fair	Paddy	Private	40
157	Mahenge Family	Operational	Fair	Paddy	Private	30
158	Joseph Lawa	Operational	Fair	Paddy	Private	60
159	Hassan Mgalatia	Operational	Fair	Paddy	Private	50
160	Athuman Maliyatabu (1)	Operational	Fair	Paddy	Private	200
161	Athuman Maliyatabu (2)	Operational	Fair	Paddy	Private	1500
162	Kikundi Wakulima Chita	Operational	Fair	Paddy	Private	400
163	Joseph Erzeckiel Mathias	Operational	Fair	Paddy	Private	2000
164	Mohamed Kigomba	Operational	Fair	Paddy	Private	150
165	Ziada Mahenge	Operational	Fair	Paddy	Private	1200
166	Francis Mnguka	Operational	Fair	Paddy	Private	1500
167	Gasper Sebastian Maganga	Operational	Fair	Paddy	Private	5
168	Athanas Masanja	Operational	Fair	Paddy	Private	400
169	Malondo	Operational	Fair	Paddy	Private	100
170	Bushiri Twahibu	Operational	Fair	Paddy	Private	700
171	Gervas Manjori	Operational	Fair	Paddy	Private	1200
172	Elias Chiwambo	Operational	Fair	Paddy	Private	30
173	Annete Sanga	Operational	Fair	Paddy	Private	600
174	Klodwit Ndunguru	Operational	Fair	Paddy	Private	400
175	Freddy Mjoge	Operational	Fair	Paddy/Maize	Private	2000
176	Bosco Kindanda	Operational	Fair	Paddy	Private	2500
177	David Ndelwa	Operational	Fair	Paddy	Private	2000
178	Ernest Eguye	Operational	Fair	Paddy	Private	2000
179	Freddy Kabelege	Operational	Fair	Paddy	Private	25
180	Germanus Mkorefu	Operational	Fair	Paddy	Private	50
181	Prof.Rashid Muhoma	Operational	Fair	Paddy	Private	200
182	Kudra Sama 2	Operational	Fair	Paddy	Private	30
183	Kilimo cha Yesu(KCY)	Operational	Good	Paddy/Maize	Private	1000
184	Hamood Salehe (Masuke)	Operational	Fair	Paddy	Private (2)	1,000
185	Madale 2 WRS	Operational	Fair	Paddy	Private (2)	200

No	Name of owner	Status	Condition	Crops stored	Ownership	Capacity (T)
186	Amos Underson Pwere	Operational	Fair	Paddy	Private (2)	1500
187	Shija Mdee	Operational	Fair	Paddy	Private (2)	600
188	David Mfiwa	Operational	Fair	Paddy	Private (2)	750
189	Anjelus Masekesa	Operational	Fair	Paddy	Private (2)	450
190	Traders Group	Operational	Fair	Paddy	Private (2)	1000
191	Juma Musoma Nyamoga	Operational	Fair	Paddy	Private (2)	170
192	Castor Deodatus Mturuku	Operational	Fair	Paddy	Private (2)	1000
193	John Kyaka	Operational	Fair	Paddy	Private (2)	400
194	Kudra Sama 1	Operational	Fair	Paddy	Private (2)	2000
195	Juma Nyamwaga	Operational	Fair	Paddy	Private (2)	900
196	Nuru Kanyemka	Operational	Fair	Paddy	Private (2)	1800
197	Boniphace Mwalongo (Likomokomi)	Operational	Fair	Paddy	Private (3)	900
198	Galus Tomeka	Operational	Fair	Paddy	Private (3)	1400
199	Bushiri Twahibu	Operational	Fair	Paddy	Private (4)	1050
200	Andrea Lugome	Operational	Fair	Paddy	Private (5)	800
a) Sub-Total Operational (Private)						**73,425**
201	Mbingu Famers Association	Not Operational	Fair	Paddy	Private	20
202	Ifakara Rice	Not Operational	Fair	Mpunga	Private	500
b) Sub-Total Un-operational (Private)						**520**
203	Kapolo village	Operational	Fair	Paddy	Public	200
204	Jose Ngailo (village warehouse)	Operational	Fair	Paddy	Public	100
205	Mang'ula A Farmers Assoc	Operational	Fair	Paddy	Public	200
206	Mang'ula "A" village	Operational	Good	Paddy	Public	200
207	Katurukila village	Operational	Fair	Paddy	Public	120
208	Katurukila village	Operational	Fair	Paddy	Public	500
209	Sanje village	Operational	Fair	Paddy	Public	120
210	Idete village	Operational	Fair	Paddy	Public	120
211	Village warehouse (KIVEDO)	Operational	Good	Paddy	Public	2000
212	Village warehouse (OLAM)	Operational	Fair	Kakao	Public	200
213	Chita village	Operational	Fair	Paddy	Public	120
214	Utengule 1 village	Operational	Fair	Paddy	Public	150
215	Utengule 2 village	Operational	Fair	Paddy	Public	120
216	Mkasu Farmers Association	Operational	Fair	Paddy	Public/UKICU 3	120
217	Coops warehouses	Operational 1	Fair	Paddy	Public/UKICU 4	560
c) Sub-Total Operational (Public)						**4,830**
218	Mchombe village	Not Operational	Fair	Paddy	Public	120
219	Mlimba village	Not Operational	Fair	Paddy	Public	120
220	Kamwne village	Not Operational	Fair	Paddy	Public	200
221	Village wrehouse (KIVEDO)	Not Operational	Good	Paddy	Public	2000
222	Ikule village	Not Operational	Under cons		Public	300
223	Village warehouse (Mkangawalo)	Not Operational	Under cons	Paddy	Public	300
224	Mofu village	Not Operational	Fair	Paddy	Public	200
225	Village warehouse (Ms/Station)	Not Operational	Fair	Paddy	Public	200
226	Mkamba village	Not Operational	Fair	Paddy	Public	120
227	Kidatu village	Not Operational	Fair		Public/Coop	120

No	Name of owner	Status	Condition	Crops stored	Ownership	Capacity (T)
228	Village warehouse (MS/Ujamaa)	Not Operational	Fair	Paddy	Public	120
229	Sonjo village	Not Operational	Fair	Paddy	Public	120
230	Mgudeni village	Not Operational	Fair	Paddy	Public	200
231	Mgudeni village	Not Operational	Fair	Paddy	Public	120
232	Kiberege Farmers Association	Not Operational	Fair	Paddy	Public	120
233	Kibaoni village	Not Operational	Fair	Rented out	Public	120
234	Vilaji warehouse - Mbasa	Not Operational	Fair	Mpunga	Public	120
d) Sub-Total Un-operational (Private)						**4,600**
GRANT TOTAL						**83,375**

Appendix 6: Warehouse storage capacity in Mbarali District

No	Name of owner	Village	Ownership	Capacity (T)
1	Anjelo M. Mbinda	Ubaruku	Private	1000
2	Tanu Adam Denyimembe	Ubaruku	Private	4500
3	Ruhiye	Ubaruku	Private	2000
4	Robert Ndashuka	Ubaruku	Private	900
5	Elia Bailo	Ubaruku	Private	400
6	Willy Micheal Masihi	Ubaruku	Private	200
7	Festo Sanga	Ubaruku	Private	400
8	Robert Mdindile	Ubaruku	Private	2600
9	Mwanjali Shaibu	Ubaruku	Private	400
10	Yunusi Katembo	Ubaruku	Private	3000
11	Athuman Rajabu Mwachuma	Ubaruku	Private	250
12	Halfan Mwanakalongo	Ubaruku	Private	100
13	Mbarali Estates	Ubaruku	Private	500
14	Omary Malifeza Mbule	Mabadaga	Private	100
15	Edson Lutumo	Mabadaga	Private	800
16	Village Government	Uturo	Private	40
17	Emmanuela Muhemeji	Mabadaga	Private	500
18	Mbule Kipokile	Mbuyuni	Private	300
19	Benedict M. Kitalika	Chimala	Private	300
20	Francis Mtega	Chimala	Private	500
21	Matono Vahaye	Chimala	Private	400
22	Twalib Tamim Lubandamo	Chimala	Private	500
23	Andrew Mwaipaja	Chimala	Private	250
24	Adam M. Msemwa	Chimala	Private	480
25	Kapunga Rice Farms	Kapunga	Private	5000
26	Mr. Meharab	Muwale	Private	1200
27	Igurusi Market Board	Igurusi	Private	2000
28	Majengo AMCOS	Chamoto	Private	300
29	Finis Langani Isote	Ilongo	Private	500
30	Meharb	Nsonyanga	Private	1500
31	Kitumtu	Kapyo	Private	70
32	Milele Kaponda	Mswiswi	Private	900
33	Eliah Ngoha Nyambo	Azimio	Private	150
34	Richard Zakaria Mhumba	Ukwavila	Private	10
35	Kaunda	Ukwavila	Private	1500
36	Kipokile	Uturo	Private	2000
37	Kibiriti	Mabadaga	Private	2000
38	Kibiriti	Mabadaga	Private	2000
39	Mbule	Mabadaga	Private	2000
40	Norah	Mabadaga	Private	2000
41	Norah	Mabadaga	Private	2000
42	Muhadi	Mabadaga	Private	2000
43	Mnyalu	Mabadaga	Private	2000
44	Adam Maso	Mabadaga	Private	2000

45	Village Government	Mabadaga	Public	40
46	Village Government	Mbuyuni	Public	40
47	Mbuyuni Irrigation Scheme	Mbuyuni	Public	3000
Sub-Total (Private)				**54,630**
48	UFACO	Chimala	Public	3000
49	Village Government	Azimio Mswiswi	Public	500
50	Ipatagwa Irrigation Scheme	Ilongo	Public	3000
51	Motombaya Irrigation Scheme	Igalako	Public	3000
52	Village Government	Nsonyanga	Public	400
53	Kongolo Mswiswi Irrigation Scheme	Kongolo	Public	2000
54	MALF	Madibira	Public	2000
55	Village Government	Mkunywa	Public	550
56	Village Government	Mahango	Public	550
57	RPCS Ltd	Itingi (Mawindi)	Public	400
58	MICU Ltd	Rujewa	Public	1500
59	MICU Ltd	Rujewa	Public	400
60	Village Government	Nyeregete	Public	400
Sub-Total (Public)				**17,700**
GRAND TOTAL				**72,330**

Appendix 7: Warehouse storage capacity in Mbozi District

No.	Place			Owner	Number	Crops	Status	Condition	Capacity (T)
	Division	Ward	Village						
1	Vwawa	Kilimampimbi	Ikomela	Shiwanda Farm	1	Coffee/Maize	Operational	Good	150
2	Vwawa	Kilimampimbi	Kilimampimbi	Kamaro Farm	1	Coffee/Maize	Operational	Good	150
3	Igamba	Igamba	Igamba	Kikundi cha wakulima wa Kahawa Mpogolo	1	Coffee	Operational	Good	50
4	Igamba	Igamba	Igamba	UWAKI group	1	Coffee	Operational	Good	20
5	Igamba	Igamba	Igamba	Zelubabel Nzowa	1	Coffee	Operational	Good	50
6	Igamba	Igamba	Igamba	Ezekia Mwasenga	1	Coffee/Maize	Operational	Good	20
7	Igamba	Itumpi	Itumpi	Debora Katembo	1	Coffee/Maize	Operational	Good	30
8	Igamba	Magamba	Magamba	ASA (Agric Seed Agency)	3	Maize	Operational	Need Rht	1500
9	Igamba	Shiwinga	Shiwinga	Rafa Group	1	Beans	Operational	Good	150
10	Vwawa	Vwawa	Vwawa	Richard Mwashitete	1	Coffee/Maize	Operational	Good	500
11	Vwawa	Hasanga	Isangu	Hansbery Mlau	1	Beans	Operational	Good	500
12	Vwawa	Vwawa	Vwawa	Chama cha Ushirika MBOCU	1	Maize/Fertilizer	Operational	Need Rht	500
13	Vwawa	Vwawa	Vwawa	Loko Mwampashi	1	Fertilizer	Operational	Good	300
14	Vwawa	Vwawa	Vwawa	Unyiha Associates Ltd	1	Fertilizer/Seeds	Operational	Good	500
15	Vwawa	Vwawa	Vwawa	Mbwaga	1	Fertilizer	Operational	Good	300
16	Vwawa	Mlowo	Mlowo	Majinja Milling	1	Maize	Operational	Good	250
17	Vwawa	Mlowo	Mlowo	Richard Kalonge Milling	3	Fertilizer/Seeds	Operational	Good	900
18	Vwawa	Mlowo	Mlowo	Richard Kalonge	1	Maize	Operational	Good	100
19	Vwawa	Mlowo	Mlowo	Gilbert D Mwangoka	1	Coffee/Maize	Operational	Good	300
20	Vwawa	Mlowo	Mlowo	Chenes Mbughi	1	Coffee/Maize	Operational	Good	200
21	Vwawa	Mlowo	Mlowo	Unyiha Associates Ltd	1	Fertilizer/Seeds	Operational	Good	600
22	Vwawa	Mlowo	Mlowo	Unyiha Associates Ltd	2	Maize	Operational	Good	800
23	Itaka	Bara	Bara	David Robison	1	Coffee	Operational	Good	
24	Itaka	Itaka	Itaka	John Mwakalinga	2	Coffee	Operational	Good	70
25	Igamba	Itumpi	Iyenga	Rafa Group	1	Beans/Coffee	Operational	Good	80
26	Iyula	Myovizi	Igunda	DAE LTD	1	Coffee/Maize	Operational	Good	400
27	Vwawa	Ihanda	Majengo	Rafa Group	1	Beans	Operational	Good	100
a) Sub-Total Operational Warehouses (Private)					**33**				**8,520**
28	Vwawa	Isandula	Chimbuya	Wilson Mwawalo	1	Maize	Un-operational	Good	200
29	Vwawa	Isandula	Chimbuya	Rafa Group	1	Beans	Un-operational	Under Con	70

No.	Place			Owner	Number	Crops	Status	Condition	Capacity (T)
	Division	**Ward**	**Village**						
30	Iyula	Myovizi	Igunda		1	Maize/Millet/simsim	Un-operational	Under Con	150
b) Sub-Total un-operational Warehouses (Private)					**3**				**420**
31	Igamba	Isansa	Nansama	Village government	1	Coffee/Maize	Operational	Good	250
32	Igamba	Isansa	Mpito	Chama cha Ushirika	1	Coffee/Maize	Operational	Good	200
33	Igamba	Itumpi	Itumpi	Chama cha Ushirika	1	Coffee/Maize	Operational	Good	300
34	Igamba	Shiwinga	Shiwinga	Village government	1	Maize	Operational	Good	300
35	Igamba	Shiwinga	Hatelele	Chama cha ushirika	1	Maize	Operational	Good	300
36	Igamba	Halungu	Halungu	Village government	1	Maize	Operational	Good	300
37	Igamba	Halungu	Lwati	Village government	1	Maize	Operational	Good	250
38	Igamba	Halungu	Shasya	Village government	1	Coffee/Maize	Operational	Good	250
39	Igamba	Halungu	Halambo	Village government	1	Maize	Operational	Good	300
40	Igamba	Halungu	Hampangala	Village government	1	Maize	Operational	Good	300
41	Igamba	Msia	Iganduka	Village government	1	Maize	Operational	Good	250
42	Igamba	Msia	Ibembwa	Village government	1	Coffee/Maize	Operational	Good	200
43	Igamba	Wasa	Wasa	Village government	1	Coffee/Maize	Operational	Good	250
44	Igamba	Wasa	Malolo	Village government	1	Coffee/Maize	Operational	Good	300
45	Igamba	Igamba	Igamba	AMCOS	1	Coffee/Maize	Operational	Good	2,000
46	Igamba	Igamba	Msanyila	Village government	1	Coffee/Maize	Operational	Good	300
47	Itaka	Bara	Ikonya	Village government	1	Coffee/Maize	Operational	Good	250
48	Itaka	Bara	Iporoto	Village government	1	Coffee/Maize	Operational	Good	300
49	Itaka	Nambizo	Nkanga	Village government	1	Maize	Operational	Good	250
50	Itaka	Nambinzo	Nambinzo	Village government	1	Coffee/Maize	Operational	Good	250
51	Itaka	Nambinzo	Isenzanya	Village government	1	Maize	Operational	Good	250
52	Itaka	Nambinzo	Shitunguru	Village government	1	Maize	Operational	Good	300
53	Itaka	Itaka	Insani	Village government	1	Coffee/Maize	Operational	Good	250
54	Itaka	Itaka	Hamwelo	Village government	1	Coffee/Maize	Operational	Good	300
55	Iyula	Myovizi	Mahenje	Village government	1	Maize	Operational	Good	250
56	Iyula	Myovizi	Igunda	Village government	1	Coffee	Operational	Good	250
57	Iyula	Iyula	Ipyana	Village government	1	Coffee/Maize	Operational	Good	200
58	Iyula	Iyula	Iyula	Village government	1	Coffee/Maize	Operational	Good	200
59	Iyula	Idiwili	Ilomba	Village government	1	Coffee/Maize	Operational	Good	300
60	Iyula	Ruanda	Ihowa	Village government	1	Coffee/Maize	Operational	Good	200
61	Iyula	Ruanda	Lumbila	Village government	1	Coffee/Maize	Operational	Good	300
62	Iyula	Ruanda	Wellu II	Village government	1	Coffee/Maize	Operational	Good	250

No.	Place			Owner	Number	Crops	Status	Condition	Capacity (T)
	Division	**Ward**	**Village**						
63	Iyula	Mlangali	Mlangali	Village government	1	Coffee/Maize	Operational	Good	300
64	Vwawa	Nyimbili	Mpanda	Village government	1	Maize	Operational	Good	250
65	Vwawa	Nyimbili	Hantesya	Village government	1	Coffee/Maize	Operational	Good	250
66	Vwawa	Nyimbili	Nyimbili	Village government	1	Coffee/Maize	Operational	Good	250
67	Vwawa	Ihanda	Ihanda	Village government	1	Maize	Operational	Good	200
68	Vwawa	Ihanda	Malonji	ADP Mbozi	1	Coffee/Maize	Operational	Good	300
69	Vwawa	Ihanda	Sumbaluela	ADP Mbozi	1	Coffee/Maize	Operational	Good	250
70	Vwawa	Isandula	Mponela	Village government	1	Coffee/Maize	Operational	Good	250
71	Vwawa	Isandula	Chizumbi	Village government	1	Coffee/Maize	Operational	Good	250
72	Vwawa	Isandula	Ukwile	Village government	1	Coffee/Maize	Operational	Good	200
73	Vwawa	Vwawa	Ilembo	Village government	1	Coffee/Maize	Operational	Good	250
74	Vwawa	Vwawa	Old Vwawa	ADP Mbozi	1	Coffee/Maize	Operational	Good	250
75	Vwawa	Hasanga	Isangu	Village government	1	Coffee/Maize	Operational	Good	300
76	Vwawa	Ipunga	Ipapa	Village government	1	Coffee	Operational	Good	250
c) Sub-Total un-operational Warehouses (Public/BRN Rehabilitated)					**46**				**13,700**
GRAND TOTAL					**82**				**22,640**

Appendix 8: Warehouse storage capacity in Morogoro Rural District

a) Storage capacities for selected warehouses in Morogoro Rural District

Warehouse	Number	Year constructed/rehabilitated	Donor	Capacity (T)	Status	Condition	Owner
Mikese	3	1980s	FAO	200/300	Operational	Good	Community
Gomero	1	1980s	FAO	200/300	Operational	Good	Community
Milengwelengwe	1	1980s	FAO	200/300	Operational	Good	Community
Tulo	1	2011/12	DADPS	200	Operational	Poor	Community
Kongwa	1	2011/12	DADPS	200	Operational	Poor	Community
Selembara	1	2011/12	DADPS	200	Operational	Poor	Community
Magogoni	1	2009/10	ACT/TAP	200/300	Operational	Good	Community

b) Status of warehouse projects implemented by (DADPS) in Morogoro Rural District for the period 2005/06 – 2014/15

Village	Completion stage	Requirements
Milengwelengwe	Completed and operational, but needs improvement	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Gomero	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Bonye	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 55,000,000
Fulwe	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Mtego wa Simba	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Newland	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Dala	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Kongwa	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 50,000,000

Village	Completion stage	Requirements
Magogoni	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 50,000,000
Kolero	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Kikundi	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Mngazi	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000
Vigolegole	Completed and operational but needs rehabilitation	Rehabilitation of drying area and water system, weighing scale/balance, moisture meter, pallets, fence, toilet and electricity - estimated at TZS 45,000,000

Appendix 9: Warehouse storage capacity in Karatu District

Ward	Village/Warehouse	Capacity (T)	Condition/Status	Crops	Owner
Mbulumbulu	Upper Kitete	200	Good/operational	Grains	Village
	Slahhamo	200	Good/operational	Grains	Village
	Kambiya Simba	200	Good/operational	Grains	Village
	Rhotia Kati	200	Good/operational	Grains	Village
	RhotiaKainam	200	Good/operational	Grains	Village
Ganako	Ayalabe	400	Good/operational	Grains	Ayalabe Cooperative
	Ayalabe	400	Good/operational	Grains	Private
	Tloma	200	Good/operational	Grains	Village
	Tloma	200	Good/operational	Grains	Cooperative
	Tloma	300	Good/operational	Grains	Private
Baray	Dumbechand	200	Good/operational	Grains	Village
	Jobaj	200	Good/operational	Grains	Village
Qurus	Qurus	200	Good/operational	Grains	Village
	Bashay	200	Good/operational	Grains	Village
	Gongali	200	Good/operational	Grains	Village
	Gyekrum Lambo	200	Good/operational	Grains	Village
	Kinnhe	200	Good/operational	Grains	Private
Endamarariek	Endamarariek	200	Good/operational	Grains	Village
	Endallah	200	Good/operational	Grains	Village
	Getamock	200	Good/operational	Grains	Village
	Bassodawish	200	Good/operational	Grains	Village
	Endamarariek	300	Good/operational	Grains	Private
Endabash	Endabash	200	Good/operational	Grains	Village
	Qaru	200	Good/operational	Grains	Village
Buger	Buger	200	Good/operational	Grains	Village
	Endonyawet	200	Good/operational	Grains	Village

Ward	Village/Warehouse	Capacity (T)	Condition/Status	Crops	Owner
Kansay	Kansay	200	Good/operational	Grains	Village
Karatu	Gyekrum Arusha	200	Good/operational	Grains	Village