



**AFRICA AGRICULTURAL
MARKETS PROGRAM (AAMP)**



Implementing Warehouse Receipt Systems in Africa Potential and Challenges

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Paper prepared for the Fourth African Agricultural Markets Program Policy Symposium, organized by the Alliance for Commodity Trade in Eastern and Southern Africa (ACTESA) of the Common Market for Eastern and Southern Africa (COMESA).

September 6-7, 2010, Lilongwe, Malawi

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Table of Contents

1. Introduction	1
1.1 Definition and brief history of WRS in Africa	1
2. Benefits and role of WRS in improving agricultural marketing in Africa	4
2.1 Inefficiency in agricultural markets and underlying factors	4
2.2 WRS opens up access to remunerative markets	5
2.3 WRS reduces scope for cheating in agricultural trade.....	7
2.4 WRS enhances liquidity in the agricultural trade	8
2.5 WRS can help reduce post-harvest losses.....	9
2.6 Viable WRS improve prospects for success in promoting commodity exchanges	10
3. Tackling challenges in the development of WRS in the ESA	10
3.1 Lack of suitable storage infrastructure.....	10
3.2 Legal and regulatory issues.....	11
3.3 Lack of requisite skills	12
3.4 Missing or weak complementary market institutions and other infrastructure.....	12
3.5 Challenges in attracting key stakeholders.....	13
3.6 Ensuring effective participation by smallholder farmers.....	14
3.7 Policy-related constraints.....	14
4. Conclusion	17

List of Figures

FIGURE 1: EXAMPLE OF REGULATED WAREHOUSE RECEIPT SYSTEM.....	3
Box 1: WRS pilot for maize in Zambia	6
Box 2: Using WRS enables rural cooperative in Tanzania to export cotton	6
Box 3: Coffee producers in Tanzania increase earnings.....	8
Box 4: Malawi uses options to manage price of imported maize	16

"Implementing Warehouse Receipt System in Africa: Potentials and Challenges".

1. Introduction

The development of warehouse receipt systems (WRS) emerged as an important means of improving the performance of agricultural marketing systems in Africa following liberalisation in the 1980s. Progress in promoting WRS and related market institutions in Africa has generally been slow or limited but interest remains high in Eastern and Southern Africa as well as elsewhere in Africa. For example, Uganda is expanding its WRS, especially for grains, to ensure increased trading activities by its commodity exchange. Tanzania intends to strengthen its warehouse regulatory regime in order to ensure that receipting can be mainstreamed for staple grains as has been achieved for export crops such as coffee, cotton and cashew. This is seen as essential in ensuring the viability of a commodity exchange which public and private sector players intend to establish. In Zambia, stakeholders are advocating warehouse legislation in order to build confidence in the receipt system, while investing in rural aggregation infrastructure to expand scope for smallholder access to the receipt system. The Government of Kenya has in its 2010/11 budget statement committed itself to supporting the development of WRS and other related exchange infrastructure, building on a pilot initiated by the Eastern Africa Grain Council (EAGC). The objective is to develop institutional infrastructure that will improve management of household food security as well as ease access to regional markets for Kenyan stakeholders. The Government of Rwanda is similarly collaborating with the EAGC to promote WRS as a means of ensuring more efficient trade in staple grains. Elsewhere in West Africa, the Abuja Securities and Commodity Exchange is seeking Federal Government support to develop a WRS which will strengthen its delivery system and boost trade on the exchange floor. Similar initiatives are being pursued in Ghana and Burkina Faso.

What is apparent from the above is that expectations remain high that WRS can be a strategically important part of efforts to transform agricultural marketing systems in Africa. In this paper we argue that this expectation is not misplaced – illustrating with evidence from successful WRS pilots in Eastern and Southern Africa (ESA) how it can help in addressing some of the factors contributing to inefficiency in agricultural commodity trade. In the rest of this section we define WRS and briefly trace the history of the models which have been promoted in Africa. In Section 2 we review benefits from the system based on cases from the ESA. This is followed in Section 3 with discussion of the main challenges which have frustrated the development of WRS and practical steps which can be taken to address them.

1.1 Definition and brief history of WRS in Africa

Under WRS, warehouse receipts are issued by warehouse operators as evidence that specified commodities of stated quantity and quality, have been deposited at particular locations by named depositors. The warehouse operator holds the stored commodity by way of safe custody; implying he 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. As such, in case of liquidation, the warehouse operator's creditors will not be able to seek recourse to the commodities stored since legal title remains with the depositor or bona fide holder of the receipt. The only exception is the warehouse operator's lien covering outstanding storage

costs. 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 a trade counter-party – which entitles the holder to take delivery of the commodity upon presentation of the WR at the warehouse. The depositor may be a producer, farmers' group, trader, exporter, processor or any individual or corporate entity.

Liberalisation created significant space for local subsidiaries of international inspection companies to offer warehousing and commodity collateralisation services without any regulatory oversight. These companies set up tripartite *collateral management agreements* (CMAs) involving a bank, the borrower and the collateral manager (i.e. the inspection company acting as warehouse operator) for the primary purpose of allowing the depositors to secure bank credit. Most of these are companies had headquarters in Europe and enjoyed a competitive advantage over local collateral management companies because of they were able to obtain substantial insurance and professional indemnity cover from international insurance companies. Examples include Societe Generale de Surveillance (SGS), Bureau Veritas, Socotec/ITS and Audit Control and Expertise (ACE).

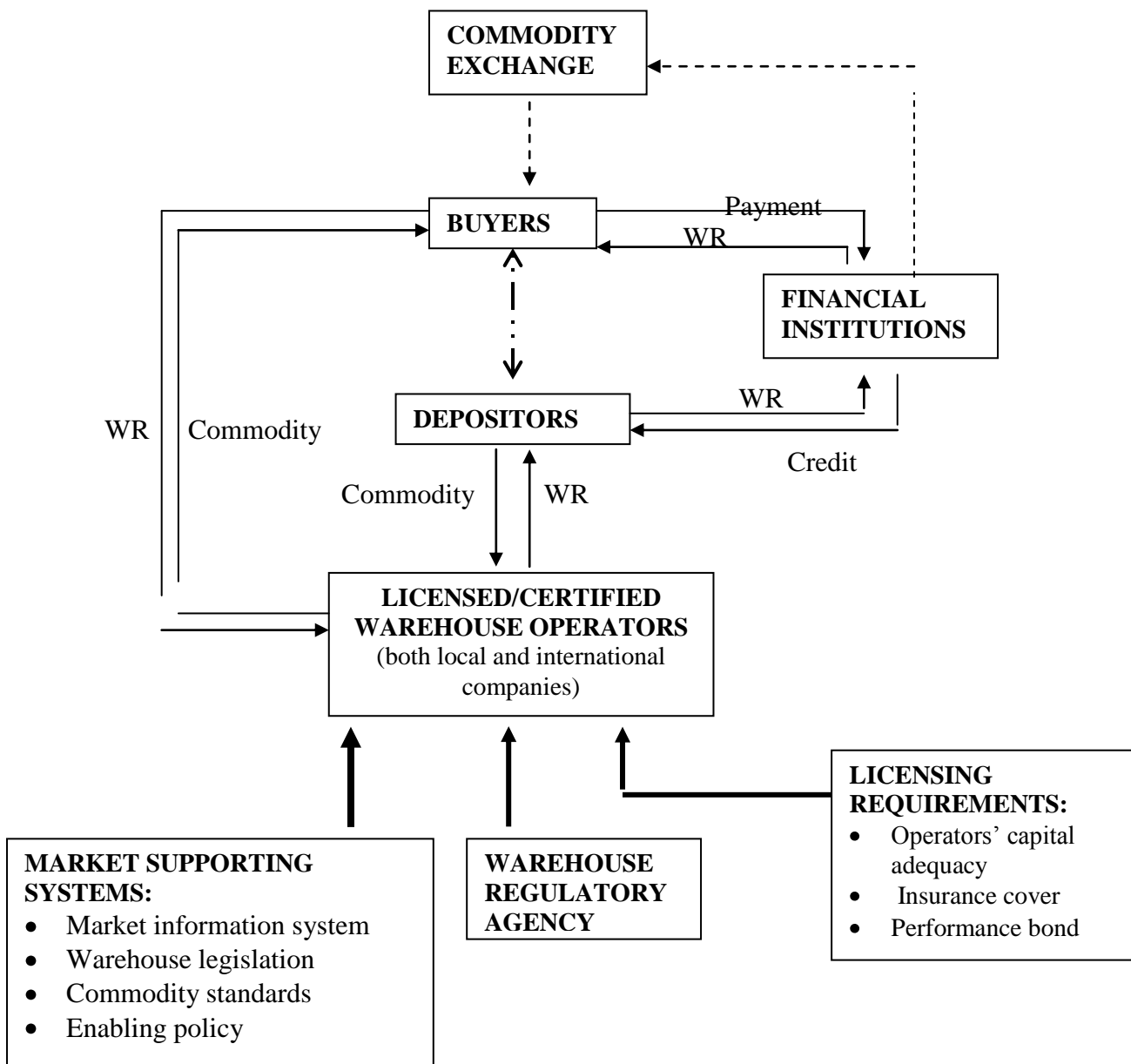
The CMA system provided confidence for banks to finance especially imports, sometimes making it difficult for domestic producers to compete – a case in point being the local rice in industry in Ghana. It also enabled large-scale processor to stockpile raw material inventories while reducing performance risk for exporters. However, one of its major drawbacks is exclusion of small-scale producers and traders as the main users are large-scale operators who own or can rent entire warehouses or silos and can afford fees costing thousands of dollars (US) per month. The system is predominantly used for financing import and export transactions but rarely for non-tradables, except where the depositor is a large processor or major trading company. In most African countries, there have been very limited benefits to the domestic agricultural trade. The warehouse receipts issued under this system are non-transferable and therefore cannot be used as delivery instruments against contracts.

Partly in response to the exclusion of smallholder farmers from accessing the CMAs, attempts were made by NGOs to establish inventory credit systems targeting farmers' groups, the pioneer in this being TechnoServe in Ghana. The primary objective was to enable producers utilise inventory credit to delay sale of produce and therefore benefit from seasonal rise in commodity prices, especially in the staple grains markets. The approach involved deposit of storable commodities in small village warehouses, with storage capacity ranging from 50 tonnes to 1,000 tonnes. The participating groups act as warehouse operators, with oversight by the NGO. Financing is usually secured against a guarantee by the NGO (in the Ghana case TechnoServe provided a guarantee equivalent to 100% of the inventory credit advanced). Similar systems are quite common in Francophone West Africa, where they are referred to as the *Warrantage System*. In Tanzania, IFAD funded a similar pilot where commercial collateral management companies were contracted to manage deposited commodities. The IFAD-funded project heavily subsidised the collateral management fees. Though this system brought major immediate benefits to participating farmers, it is often not sustainable because of the small volumes of grain involved – usually much less than 1,000 tonnes of maize in a single year (Kwadjo, 2000). The pioneering scheme by TechnoServe required intensive supervision and the cost of this is often out of proportion to the benefits involved.

In the mid-1990s, the Natural Resources Institute (NRI) developed and piloted a regulated and widely-accessible based on lessons learnt from Europe, South America and the US. That

model involves fostering the development of a national network of privately managed certified or licensed warehouses, issuing transferable warehouse receipts and where trust is developed through a robust certification/licensing and inspection system. The key elements of this model are illustrated in Figure 1 below. Warehouses used for receipting commodities under this model are required to apply strict commodity grading and weight standards. Collateral managers as well as other private warehouse operators can be certified/licensed to issue warehouse receipts. Though helpful, especially in assuring lenders of their security interests in underlying commodities, specific warehouse legislation is not required before launching this WRS. The prime source of income of the certification agency is user fees, though it may be subsidised in its early years.

FIGURE 1: EXAMPLE OF REGULATED WAREHOUSE RECEIPT SYSTEM



- The licensed/certified warehouse operator issues WR representing goods weighed and graded (stating quality and quantity on the receipt).

- Depositor can sell directly to buyers or through the commodities exchange – with the warehouse operator guaranteeing delivery of specified quality and quantity against the WR.
- Where finance is needed, depositor pledges WR to lender and later arranges sale either through the commodities exchange or directly with a buyer who makes direct payment to the lender to obtain the WR that allows him to take possession of the underlying commodity.
- In case of default, lender can sell WR through the exchange – the financing contract should allow lender to liquidate WR without litigation.

One advantage this model has over the other two discussed above is that the regulatory system is expected to reduce losses by warehouse operators. For instance under the unregulated CMA, collateral managers sometimes experience losses through theft and fraud. Where losses occur, their liability tends to be limited by indemnity clauses in the storage contracts; the consequence being to discourage banks from providing finance against collateralised inventory. The model also overcomes the drawback with the NGO-sponsored inventory credit (*warrantage*) systems with regards to sustainability as it fosters a warehousing scheme that is open to a wider clientele than simply smallholder farmers, thereby building up volumes, reducing unit costs and improving overall system efficiency.

The most advanced regulated WRS has been developed in Tanzania under a project funded by the Common Fund for Commodities (CFC), initially for the coffee and cotton sub-sectors but subsequently expanded to cover cashew and grains such as maize and rice. A similar pilot in Uganda developed a foundation on which the Uganda Commodity Exchange (UCE) is developing its delivery mechanism, especially for grains. In Zambia, the Zambia Agricultural Commodity Exchange (ZAMACE) inherited a WRS successfully piloted with support from CFC and other donors including USAID, IFAD (under its SHEMP Project) and the Dutch Government. However, as noted by Coulter (2009) in a review undertaken on behalf of UNCTAD, progress in developing WRS in the ESA, as in other regions of Africa, has been frustratingly slow. In the next section we discuss the potential role of the regulated WRS in improving agricultural marketing in Africa and follow that up in Section 3 with a review of the challenges which have frustrated efforts develop these systems.

2. Benefits and role of WRS in improving agricultural marketing in Africa

2.1 Inefficiency in agricultural markets and underlying factors

About three decades after liberalisation, agricultural markets in Africa remain largely inefficient. These markets are typically characterised by high distribution margins and seasonal price variability (Badiane et al., 1997). Poor rural transport infrastructure is one of the contributory factors as, quite often, food-surplus areas lack good road and rail networks, leading to under-investment in haulage transport facilities in rural communities and consequent high transit losses, the cost of which is passed onto consumers (Teravaninthorn and Raballand 2009). Lack of efficient storage infrastructure is another factor. It is a major reason for the very high levels of postharvest losses found in Africa – often estimated at 30 percent. A recent study questioned this estimate and projected that postharvest losses in the grain sector in the ESA for instance is in the region of 13.5 percent (World Bank, NRI and FAO 2010). However, even at this lower level, they estimate value of grain losses in the ESA and Sub-Saharan Africa (SSA) as a whole at US \$1.6 billion and US \$4 billion per year respectively.

According to the study, the annual value of grain losses equates to the total value of its cereal imports, an indication that reducing postharvest losses offers a cost-effective means to improve food availability.

Transaction costs in Africa's agricultural markets are also very high as noted by Fafchamps and Gabre-Madhin (2006). This is attributable in part to the cost of assembling produce from atomistic and widely-dispersed production units as well as uncertainty about the quality and quantity attributes of goods being exchanged, the result of the absence of effective systems of standard grades and measures. Contract enforcement is poor and as a consequence the rural trade is predominantly cash-based, thus accentuating the problem of illiquidity in the trade which is the result of limited access to commodity finance. The markets lack transparent systems of price discovery as well as institutions and instruments to manage price risks. The marketing uncertainty created dampens production incentives and stymies growth in agricultural output and productivity. High food price variability makes poor consumers in urban and deficit-producing rural areas prone to food insecurity.

2.2 WRS opens up access to remunerative markets

Producer groups as well as small and medium-scale traders are usually unable to enjoy improved margins by trading with players further down the marketing chain. This is largely because, in an environment where formal contract enforcement mechanisms, lacking the ability to develop trust based on repeat transactions or informal relationships or access to market institutions which facilitate trade-by-description constitutes a significant barrier to entry such markets. The WRS offers a means to overcome this barrier. First, it enables smallholder farmers to bulk their crop for deposit, ensuring compliance with quality standards and minimum quantity requirements. The quality and quantity of the stored commodity which can be traded is assured, thus making 'sight-unseen' trade possible, implying sellers can sell to buyers in a wider geographical area than their immediate location. Furthermore, the guarantee of delivery by warehouse operators reduces counterparty risk, that is, the risk of non-performance of trade contracts. As demonstrated in Box 1 a maize producer group in Zambia – Kulya Nkona Agari-Cooperative Society – took advantage of these benefits of the WRS to sell maize directly into the dollarized domestic formal market (i.e. directly to the millers). In Tanzania another producer group was able to export cotton lint to a UK-based buyer by means of the WRS (Box 2).

Box 1: WRS pilot for maize in Zambia

A warehouse receipt system was piloted in Zambia for grains under a project funded by the Common Fund for Commodities (CFC) and implemented by the Natural Resources Institute (NRI). The project succeeded in creating the foundations for a thriving WRS, which was accessible to both commercial and smallholder farmers. Implementation of the WRS project was launched in 2000 and its pilot use occurred in the 2003/04 season. Its most successful season was the 2004/05 season when four warehouse operators with total storage capacity 105,000 tonnes were certified; 65,000 tonnes of maize was deposited, out of which 3,764 tonnes was deposited by smallholder farmer groups. The receipted stocks were financed by Intermarket Discount House, Barclays Bank, Standard Chartered and Stanbic Bank at average advance rate of 78.6%.

A smallholder group which participated during the season is the Kulya Nkona Agri-Cooperative Society in the Central Province of Zambia. They deposited 950 tonnes of maize at certified warehouses in Chisamba. The cooperative obtained inventory finance from Barclays Bank and sold directly to Lusaka millers five months. In an interview, Mr Amos Makweja (Chairman of the Coop), is quoted as saying "... without the warehouse receipt system we could not keep our maize until it could get good prices ... before we just got very poor prices for our maize. Nobody can cheat me because my maize is kept where everything is recorded ... and it is paid for by buyers from there. Our maize is our security (for loans) and the bankers know where our maize is and that it safe"*.

Source: NRI Reports and *"Road to Market", DFID January 2005.

Box 2: Using WRS enables rural cooperative in Tanzania to export cotton

A farmer group, the Oridoyi Rural Cooperative Society (ORCS) in Tanzania, which has used the WRS in marketing its cotton since 2002 was able to raise cotton output by its members from just over 130,000 kg of seed cotton to the peak of over 1,100,000 kg of seed cotton over a period of four years. Seed cotton delivered by the members to the ORCS is warehoused and ginned for a fee by the KNCU Cotton Ginnery at Moshi. Financing is usually provided by the CRDB Bank Ltd, a major local commercial bank. In the 2005/06, the ORCS was able after ginning to market their lint directly to a UK-based cotton merchant, with the assistance of locally resident broker. The quality of their lint was certified using modern HVI equipment owned by the Tanzania Cotton Board. Hence, quality uncertainty, which can undermine impersonal trade, was mitigated. Usually, the ORCS initially pays the floor price announced by the TCB to its members when they deliver seed cotton. This is followed by subsequent payments from profits made. However, it was from retained profits that the cooperative financed cultivation of additional four hectares for each member, thus increasing output by the group.

Source: NRI and Tanzania Cotton Board reports.

It is apparent that the producer groups in the two cases described above (Boxes 1 and 2) were able to access more remunerative markets and obtain better prices because the WRS made it possible to reduce imperfect information problems that often undermine transactions between parties in agricultural markets in Africa. For instance, information asymmetry between smallholder producers and traders often skews bargaining power in favour of the latter (traders). It is for this reason that donors and governments invested in agricultural market

information systems (MIS) in many African countries. However, provision of price information alone, as tends to occur under most MIS in Africa, is insufficient in strengthening the bargaining position of producers. Institutional infrastructure such as the WRS, which improves the collection and dissemination of broader market information (including stock levels, overall supply and demand) to players, makes it possible for transparent and competitive transactions involving a large number of buyers to occur. Producers' bargaining position is, thus, strengthened because information dissemination is not de-linked from access to market opportunities.

2.3 WRS reduces scope for cheating in agricultural trade

Lack of or ineffective enforcement commodity standards (on quality as well as weights and measures) is quite common in the rural/informal trade in agricultural commodities in Africa even though such standards may exist in the formal segments of the market. For larger-scale buyers, including millers and other processors, the quality and quantity uncertainty this situation creates raises the cost of, and therefore, limits transactions with smallholder producers and other rural-based traders. On the other hand, producers and small-scale rural traders often lose out due to considerable cheating on quality and weight. For instance, in Zambia it is common for maize supplied from smallholder farmers to suffer a price discount of between 10 percent to 15 percent because of quality uncertainty. The Kulya Nkona Agri-Cooperative Society which used the WRS to market their maize (Box 1) avoided this problem as the receipt system ensured that buyers paid for the independently determined quality described on the warehouse receipt.

In post-liberalisation Uganda, while prices paid for coffee beans in the urban markets differ on the basis of quality, there is no such quality discrimination in the rural trade where producers are paid for volume delivered without enjoying any quality premium. A similar situation occurred in Tanzania after the coffee sector was liberalised, with the country consequently losing the quality premium its coffee enjoyed on the international market. The development of a WRS for the coffee sub-sector has, however, contributed to turning this situation around as illustrated in Box 3 below.

The system has, for instance, made it possible for coffee producers who are members of primary cooperative societies (PCS) to deliver quality coffee beans. They were also able to market processed coffee rather than just parchment coffee, as a result of which their members earned incremental income of close to 70 percent (relative to prices paid by private traders for parchment coffee beans). Consequently, the share of PCS in the coffee trade has been increasing and by the 2008/09 season they accounted for over 65 percent of the coffee auctioned to exporters by the Moshi Coffee Auction.

Box 3: Coffee producers in Tanzania increase earnings

Under a project funded by the Common Fund for Commodities (CFC), a network of coffee curing factories (previously owned by cooperative unions) were certified as warehouse operators, and allowed to receipt deposits of parchment coffee (Arabica) that conforms to adopted grading standards. Depositors included primary cooperative societies (PCS), other farmer associations and private traders. Participating PCS – numbering 32 with membership of over 3,500 – procure parchment coffee from their members, making an initial payment representing about 60% of the market price. Finance of up to 80% of the value of the parchment is then provided by a bank, with the stocks being used as the collateral. This financing allows the PCS to buy volumes of more than 10-times its working capital as the credit provided depends on the volume deposited. The certified operator processes the parchment into green coffee, which is marketed through a competitive bidding process at the Moshi Coffee Auction. Proceeds from the sale are channeled through the financing bank, allowing it to recover credit advanced. Since the 2002/03 season, financing to the tune of about US\$10 million has been provided to the range of depositors by two commercial and one cooperative bank in Tanzania. Members of the participating primary cooperative societies on the average obtain US\$1.10 per kg of parchment coffee sold using this system – usually paid out in three instalments. Comparative figures for farmers selling to their cooperative unions and to private traders are US\$0.75 (usually through two-to-three instalments) and one-off payment of about US\$0.65 per kg of parchment, respectively. As a result of this the PCS now account for over 65 percent of coffee sold through the Moshi Coffee Auction.

Briefing a visiting delegation from West Africa in October 2008, officials of TCCCo Ltd., one certified as warehouse operators in the coffee sub-sector, reported that the quality of coffee delivered by the PCS has been improving consistently mainly because they want to avoid rejection when the crop is delivered to designated warehouses. The participating farmers also acknowledge that their earnings reflect the quality of their produce as well as the value added prior to sale through the auction.

Source: NRI reports (various).

2.4 WRS enhances liquidity in the agricultural trade

Liquidity constraints in rural economies are a “double-edged sword” that dampens producer incentives and impacts adversely on rural household incomes. On the one hand, it often compels farm households to sell the bulk of their produce at harvest – basically to meet household consumption needs and also to repay production loans. The marketing strategy of better-capitalised, larger-scale producers is driven not so much by this pressure but rather by prevailing price levels and anticipated future price movements. On the other hand, it limits the capacity of buyers to absorb the surplus at harvest and stabilise markets through temporal arbitrage as they lack the financing to hold significant inventories. Consequently, commodity prices tend to be severely depressed immediately after harvest. Liquidity in the agricultural trade can be enhanced if lenders aversion to the provision of inventory finance is addressed through the development of credible WRS which allows stored commodities to be used as collateral for loans. Alternative forms of financing, mainly balance sheet financing and lending against immovable property in prime urban locations, which predominate in most African countries, exclude many entrepreneurs, especially those in agriculture, from the

credit market. Structured finance based on WRS tends not to discriminate against normally disadvantaged borrowers if they are able to utilise the services of licensed warehouse operators.

The case in Box 1 shows how access to inventory finance enables producer groups to defer sale during the harvest season, when prices are low, and ride the price curve to gain from seasonal price increase. The system also makes it possible for traders and processors to build up inventories and overcome limitations to scaling up due to lack of capital or cashflow difficulties. In a recent study in Ghana, Onumah and Aning (2009) established that most medium-scale traders could potentially increase their margins per tonne of maize sold from an average of 5.1 percent to over 35.1 percent if they are able to take advantage of inventory finance to build up sufficient inventories to meet contractual requirements for the year rather than the “hand-to-mouth” operations which they are compelled to engage in because they are under-capitalised. The return on their internally-generated working capital is also likely to increase more than 10 times. Even more crucially, they will be much better placed to fulfil their contracts largely because the stocks required can be stockpiled when the crop is readily available. The credibility they build as a result of this would be important in building long-term trade relations with major buyers. Processors can potentially reduce the overall cost of agricultural raw materials by about 15 percent, thus making investment in agricultural value addition more attractive. It is also expected that seasonal variability in the supply and prices of agricultural commodities will be more moderate and as a result consumers will benefit by paying relatively less for food during the lean season while producer prices at harvest will be relatively higher.

In South Africa, where a well-developed silo receipt system underpins the operation of the most mature commodity exchange in Africa, 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 enables them to service the loans but also lenders have greater control over the main security, which is the deposited crop. A similar system is evolving in the coffee, cotton and cashew sub-sectors in Tanzania on the basis of the WRS which has been successfully developed for those commodities.

2.5 WRS can help reduce post-harvest losses

In Section 2.1 we mentioned the high postharvest losses that occur in Africa. This is not only due to lack of suitable storage facilities but also to limited access to inventory credit that hampers intra and inter-seasonal stockholding. During the pre-liberalisation period, where the state played a major role in food marketing, especially of staple grains, considerable investment in storage infrastructure was made by donors and African governments. These facilities have sometimes remained under public sector control long after the role of parastatal marketing boards were either abolished or substantially scaled down. Private sector investment in storage infrastructure is often concentrated in urban areas and tends to support import/export trade rather than the domestic food trade. Storage management capacity is also highly variable in many countries and as a consequence, storage in food surplus-producing areas is largely undertaken by ill-equipped farmers, resulting in very high post-harvest losses. A viable WRS encourage storage of agricultural commodities in well-run storage facilities and can therefore help to significantly reduce post-harvest losses.

2.6 Viable WRS improve prospects for success in promoting commodity exchanges

Many African countries have attempted to set up agricultural commodity exchanges since the early 1990s. Many of these initiated by private sector players, including the South Africa Futures Exchange (SAFEX), which is now owned by the JSE Securities, the now non-functional Zimbabwe Agricultural Commodity Exchange (ZIMACE), the Agricultural Commodity Exchange for Africa (ACE) in Malawi and the Kenya Agricultural Commodity Exchange (KACE). Others have been promoted with substantial government investment or direct support. Examples include the Ethiopia Commodity Exchange (ECX) and Uganda Commodity Exchange (UCE). The Zambia Agricultural Commodity Exchange is one of the exchanges being promoted in the region with significant donor support – primarily from USAID. The UCE is also being supported by the EC. South Africa-based Bourse Africa is seeking to establish a pan-African commodity exchange. It has been licensed to operate from Botswana but is yet to make significant inroads in other African markets.

Despite the difference in lead promoters, the outcome of most exchange initiatives have been disappointingly similar – lack of progress. In most cases the underlying reason is lack of trusted delivery systems. The exceptions appear to confirm this observation. For instance, the operations of the JSE/SAFEX is underpinned by a credible silo receipt system. ZIMACE, which was one of the most successful exchanges in Africa north of South Africa, had a receipt system involving the Grain Marketing Board as the main warehouse operator and warehouse inspections undertaken by a private inspection company – ITS Socotec. The ECX emerged without a well-established WRS, but it has been most successful in trading coffee destined for the export market and this may be because the marketing system for that commodity is well-structured and also because a legal requirement that all exported coffee from Ethiopia should be traded through the exchange. The ECX is currently developing WRS for grains and other commodities as part of measures to increase formal trading.

3. Tackling challenges in the development of WRS in the ESA

The challenges which have led to the slow or limited progress in establishing WRS in Africa appear to be quite common. They include lack of suitable storage infrastructure, legal and regulatory issues, lack of requisite skills, missing or weak complementary market institutions, difficulty in attracting key stakeholders especially bankers, problems encountered in ensuring smallholder participation and disabling elements in the policy environment. We discuss these issues and practical steps which can be taken to tackle them in this section.

3.1 Lack of suitable storage infrastructure

A network of secure, well-run warehouses which are accessible to various depositors is essential prerequisite for a successful WRS. Most ESA countries have physically adequate grain storage capacity in excess of 1 million tonnes. The exceptions are Mozambique, Rwanda and Uganda which need additional investment in expanding grain storage capacity – based on data in the study by the World Bank/NRI/FAO (2010). However, the available grain storage facilities in the grain-surplus producing areas in most ESA countries are owned by grain marketing parastatals. With declining government investment and financial support, their role in the grain market has been diminishing in the post-liberalisation era, often leading to operational and financial difficulties which undermine investors' confidence in them as

credible counterparties. Private storage infrastructure tends to be concentrated in the urban markets.

Hence, while there may be excess storage capacity in grain-surplus producing areas in some ESA countries, credible private warehouse operators may not have access to the facilities, thereby limiting uptake of WRS by smallholder farmers' groups and medium-scale rural grain traders – most large-scale farmers have suitable on-farm storage. Lack of political will appears to hamper outright sale of state-owned storage facilities to private warehouse operators as a means of attracting private investment in improving the physical conditions of under-utilised facilities in rural grain producing areas. The option of setting up autonomous warehousing companies to take over state-owned storage facilities in strategic locations and offer third-party warehousing services – which offers a means to mitigate the credibility problems faced by the parastatals – has not been adopted by governments in the region. The government of Malawi considered this option while restructuring ADMARC in 2006. The Government of Zambia took the lead in leasing warehouses owned by the Food Reserve Agency to private warehouse. The Government of Mozambique is reported to have followed this model in recent times. The lease tenure tends to be rather short-term and therefore does not encourage significant investment in improving the physical infrastructure.

3.2 Legal and regulatory issues

Specific warehouse legislation and formal regulatory structures followed, rather than, led the development of the successful receipt systems in the region. For instance, South Africa's silo receipt system is not backed by specific warehouse legislation. Neither was the successful WRS for grains in Zambia backed by law. Even where specific legislation has been enacted to back WRS, as is the case in Tanzania and Uganda, the law came in after the systems had evolved. However, this does not detract from the need to resolve legal issues which can potentially diminish the holder's title to the underlying goods and/or security interest in them. It tends to be particularly important to bankers who are usually keen to avoid lengthy litigation and/or costly searches to establish the absence of previous charges on underlying commodities they intend to finance. Other issues which can be resolved by legislation is recognition of warehouse receipts as documents of title which may be transferable and negotiable instruments – in South Africa transferability of the receipts emerged as a result of *custom and practice* but statutory intervention can short circuit the process and encourage acceptance by the banking community and third party buyers. In the case of grains it is also important that legislation ensures that the security interests of holders of warehouse receipts can be assured in commingled goods.

One of the issues specific warehouse legislation can resolve is regulatory framework which is instituted to maintain the integrity of the WRS. It should be stressed that – as has been demonstrated in the case of South Africa – a strong market institution such as a commodity exchange can self-regulate its supporting receipt system on the basis of existing contract law. This may be feasible where the existing exchange promotes the WRS. However, where this is not the case, legislation may vest regulatory powers in a public, private or arms-length public-private institution for the licensing and overseeing the operations of participating warehouse operators. The law then has to be clear on licensing requirements and sanctions for breach of those requirements as well as other relevant regulations. Since the region is pursuing a policy of open borders for the grain trade, it is important that national legislations are harmonized across the region. It is particularly important to insulate the regulatory

authority from political control as well as the potential to compromise in enforcing the laws and regulations as a result of control by any dominant interests. This is important in assuring the integrity of the WRS.

3.3 Lack of requisite skills

The quality of warehouse and storage management skills tends to be highly variable in most ESA countries. Improving professional skills in the warehousing industry is necessary if storage losses are to be kept at a minimum. Similar training and capacity building is required to enable traders and processing companies to utilise the WRS in cost-effectively managing their inventories. Smallholder groups, which have to bulk and market collectively in order to meet quantity and quality requirements under the WRS, will experience considerable difficulty unless adequately trained. Bankers as well need training to enable them shift from the “traditional” balance sheet-based financing to inventory-backed structured financing.

Most WRS projects have training and capacity building components but it is important to develop institutional capacity to deliver the required training on a sustained basis at national and regional levels. The EAGC has initiated a process to establish a regional institute which will offer requisite training for various players in the grain value chain. It is expected that the institute will collaborate with relevant national training institutions to deliver the training programmes. This initiative definitely responds to an identified need and is worth supporting.

3.4 Missing or weak complementary market institutions and other infrastructure

As illustrated in Figure 1, a viable WRS is underpinned by important pillars, including a reliable market information system (MIS). Considerable progress has been made in delivering price information through regional MIS such as RATIC and via several national platforms. The development of mobile telephony has created a cost-effective means for disseminating price information, with Uganda being at the forefront. However, there is need to improve the quality of data on supply and demand, including crop forecasts as market participants are not only interested in historical prices but need to take informed positions on future price trends in determining their marketing strategy.

There is evidence from the ESA to suggest that prospects for successful development of WRS can be significantly improved if formal markets for the stored commodities exist or are created. JSE/SAFEX offers the most visible example as the silo receipts issued in South Africa back trading contracts on the exchange. In Tanzania, the WRS for coffee advanced pretty quickly, far outpacing the pilot for cotton. One reason for this is the existence of the Moshi Coffee Auction which provides a single marketing channel through which the collateralised coffee is traded, making it relatively easy to ensure payment through financing banks, thereby lowering loan default risks. Extension of WRS to the cashew sub-sector in Tanzania appears to have been boosted by the development of an informal auction system. Though this evidence needs to be more robustly tested, it is apparent that while a viable WRS contributes to the success of a commodity exchange (as pointed out in Section 2.6), the converse relationship also holds. This is because commodity exchanges offer a transparent means for price discovery and therefore more objective valuation of collateralized stocks. They also provide a reliable means by which lenders can liquidate collateralized commodities and so make inventory-backed financing more attractive. Furthermore, as an exchange

matures from a spot market into offering various risk management instruments, including futures and options contracts, lenders are able to use such instruments to hedge price risks. By so doing, they reduce credit risks, leading to lower cost of borrowing. Therefore, the synergy between WRS and commodity exchanges needs to be acknowledged and reflected in programmes to develop these market institutions in the region.

Availability of adequate insurance cover and performance bonds for licensed/certified warehouse operators assures third parties, especially depositors and lenders that their interests will be sufficiently protected in the event of a loss. While the insurance industry is often able to insure warehouses and stocks against relevant losses, there are difficulties when it comes to obtaining the right performance bonds. Insurance companies tend to issue conditional bonds, which may not be appropriate as it creates uncertainty regarding compensation in the event of non-performance by the warehouse operator. Banks are sometimes able to provide unconditional bonds which are preferred but the cost tends to be quite high. This is a challenge that needs to be addressed in order not to exclude potential warehouse operators.

Electronic warehouse receipts are growing in popularity in African countries which are promoting WRS. They are preferred by banks because of the greater security they offer against forgery. They also tend to be less costly to issue, transfer and store than paper receipts. The technology is currently available and has been successfully adopted in Uganda by a provider based in South Africa. However, the major challenge in adopting this system is the reliability of ITC infrastructure.

3.5 Challenges in attracting key stakeholders

Attracting participation by bankers in WRS projects has proved very challenging in most African countries. Financial sector reforms undertaken in Africa in the 1990s focused on liberalisation of interest rates and tightening of prudential regulation. The consequence was a deepening of risk aversion in the banking industry. At the same time yields on domestic government debt instruments rose significantly, making investment in such comparatively low-risk instruments very attractive. Therefore, banks had little or no incentives to innovate beyond traditional balance sheet lending, with the most common form of security for domestic enterprises being real estate. Increased competition in the banking industry in most African countries, especially in West Africa, appears to be encouraging banks to adopt innovative financing mechanisms which are also relatively low risk. Inventory-backed structured financing represents an option which will therefore be attractive to bankers. However, an important lesson learned in Zambia in promoting uptake of receipt-based financing, is to avoid “hard selling” of the system but rather engage the bankers in a process where they contribute to identifying business and process risks associated with the WRS as well as in instituting appropriate mitigation mechanisms. Furthermore, the pilot in Tanzania showed that it pays to focus in the beginning on a few willing banks, usually local banks which enjoy greater scope in innovating. Other banks tend to respond by free riding on the positive experiences of the early uptakers.

Other parties may not just be sceptical but may actually perceive the development of the WRS as inimical to their business interests. For instance in Zambia, the international inspection companies were reluctant to adapt their standard CMA 'product' and participate in the WRS because the new system could open up their exclusive preserve in the collateral management business to locally-owned companies. Furthermore, they viewed the introduction of regulatory oversight with suspicion. However, one of these companies was

certified as a warehouse operator in Zambia while in Tanzania and Uganda local inspection companies have been active participants, bringing valuable skills and reputation to the emerging WRS. There is potential for this trend to continue, especially as the CMA market has been shrinking in Africa because of losses which can partly be attributed to weaknesses in monitoring systems.

3.6 Ensuring effective participation by smallholder farmers

There are major political pressures to either exclusively target or fast-track direct smallholder participation in WRS projects. This emanates not only from governments but also from donors. With the smallholder sector dominant in agricultural production in most African countries, the underlying concerns over their welfare are legitimate. The cases we discussed in Section 2 demonstrate that smallholder farmers can benefit directly and indirectly from the WRS, the latter through its aggregate impact on price stability and the transparency of price formation. However, in pursuing this objective care should be taken to avoid undermining the long-term viability of the WRS because there are major issues of scale economies, both in terms of managing warehouses and providing regulatory oversight. Lessons learnt from Tanzania in particular suggest that smallholder participation and system viability can be achieved if the capacity of groups to aggregate and undertake collective marketing is strengthened. The direct financial benefits to members are highest when aggregation, depositing and marketing are undertaken by primary-level farmers' group rather than second or third-tier representative organizations such as cooperative unions. There are indications from the cases in Section 2 that can be significant pay-offs if governments, NGOs and donors support the development of strong primary-level farmers' organizations. What needs to be avoided is involvement by the regulatory authorities in promoting smallholder farmers' groups as this tends to blunt their regulatory "teeth" and can undermine confidence in the system.

3.7 Policy-related constraints

Ad hoc interventions in agricultural markets have constituted one of the most intractable bottlenecks in the development of WRS in Africa. It is worth noting that in South Africa, which has the most advanced receipt system and commodity exchange on the continent, the government has consistently maintained a policy of non-intervention since 1996 when liberal market reforms in the agricultural sector were initiated. Uganda is also one of the few countries in the ESA where government intervention in the grain market is rather marginal. This is largely because it is a significant surplus producer of maize and its most important staple is banana.

In Zambia, on the other hand, government intervenes whenever there is a short crop, usually on the grounds of avoiding food security crisis. For instance in the 2000/01 season and the next the government intervened in the maize market by imposing a ban of export of maize grains, ad hoc waiver of duties on imported *mealie meal* and delivery of subsidised grains to millers. Similar interventions occurred in 2005/06 season. In all these instances the interventions were costly but the impact on retail prices of *mealie meal* comparatively marginal. Millers often argued that the subsidised grains allocated to them was insufficient and they had to buy maize grains from the open market at exorbitant prices and could, therefore, not significantly lower ex-factory prices for the *mealie meal*. The uncertainty created as a result of these interventions discouraged producers, traders and processors from

holding significant stocks while making inventory financing became even more risky. It is therefore not surprising that it was only in the years of good harvest, including the 2004/05 season.

In Tanzania, Government also intervened in the grains market in the 2009/10 season, imposing a ban on export of maize and rice to the regional markets, especially Rwanda and Kenya. The interventions coincided with pilots of WRS for grains, in an attempt to expand coverage of the successful WRS for export commodities to the grains. However, as a result of the export ban, farmgate prices in the surplus producing areas collapsed as it proved more costly to deliver into the domestic urban markets than into the regional markets. Producer groups which collateralised their grain stocks in order to benefit from seasonal price rise incurred losses and repayment of inventory credit was put at risk. During recent discussions with officials of the Tanzania Warehouse Licence Board and Mviwata (a farmers' organisation), it was reported that the only reason why grain producers in Tanzania had decided not to abandon the WRS was that they acknowledged that their losses originated from an unfavourable policy environment rather than failure of the system. It is unlikely, however, they will continue to utilise the system if this problem is not addressed.

Strategic grain reserves provide governments with a commonly-used means to intervene in markets to dampen rising food prices resulting from supply deficits. National food reserve agencies or parastatal grain marketing boards usually manage the strategic reserves, being responsible for procurement (either from the domestic market or direct imports) and storage of the grains. Financing is usually by governments, sometimes with donor support.

Among the common problems which bedevil management of strategic grain reserves is delays in intervening, especially in initiating grains procurement. This is usually the result of delays in estimating the size of the grain deficit and in mobilising government funding for procurement. Anecdotes abound regarding farmers being paid months after supplying to food reserve agencies as a result of this situation. Procurement prices are usually not determined through a transparent market process but are rather fixed by an administrative process. Consequently, the fixed prices can exceed market prices with the procurement agency being over-supplied with grains. Subsidies are a common feature of the pricing mechanism as governments tend to sell below market prices, a situation which discourages private stockholding of grains. Though open tendering systems are sometimes used for procuring grains, especially if supplies are imported on behalf of government, it is common for less transparent procedures to be adopted, including using field staff to buy directly from smallholder farmers. Storage losses tend to be quite high – ranging between 8 and 20 percent in the region. In the short-run these problems tend to increase the cost incurred by government in maintaining the reserves. However, the longer-term and even more damaging effects include distorting private incentives to produce and hold grains stocks just as happens in the case of the trade controls discussed above.

We argue that governments and the farm economies in ESA can benefit from the use of WRS and related exchange infrastructure in managing strategic grain reserves. For instance, the Government of Malawi has demonstrated that governments and relief agencies can use price risk management instruments offered by exchanges to hedge their positions on grain markets, and thereby bring greater stability to the net prices at which they are traded in the market (Box 4).

Box 4: Malawi uses options to manage price of imported maize

Governments can use options to better manage supplies and prices within the domestic market for staple foods. Relief agency can similarly use these instruments traded on the exchange or over-the-counter to insure against a surge in the price of locally procured grain. An example of the use of this instrument was by the Government of Malawi (GOM). In September 2005, the GOM signed an options contract with Standard Bank of South Africa giving it the right, but not the obligation, to buy additional maize at a price fixed at the time the contract was signed. The contract allowed for the purchase of a maximum of 60,000 tonnes of maize at a cost of approximately \$18m – enough to meet the food gap if donor and private sector commercial imports did not reach anticipated levels. The UK Department for International Development (DFID) provided the financing to pay the options premium upfront, and the World Bank provided technical support. The options contract provided the government with a mechanism to trigger additional imports at short notice, put a price cap on the cost of maize from South Africa and provided protection against the risk that prices would move higher. Finally, agreeing an ‘over the counter’ contract meant that the cost included delivery to Malawi, reducing uncertainty over transport prices. Previously, examination of the scope for using risk management tools such as futures and options to help manage price volatility in food-insecure countries was limited by a concern about basis risk: the risk that prices on the exchange would not move in a correlated way with prices at the local level, for example in a different country often geographically far away from the exchange. This risk was removed in the ‘over the counter’ call option contract used by the Malawi government since it was structured to include price protection on both the SAFEX white maize futures price, and for transport to Malawi.

Slater and Dana (2006)

Again, as advocated by Coulter, Walker and Hodges (2007), governments and relief agencies such as the World Food Programme (WFP) can also use the WRS and exchanges to cost-effectively procure and store food from domestic and regional markets. Under its Purchase for Progress (P4P) programme, WFP is already piloting this in Zambia and Uganda and the initial results are quite encouraging. It is expected that such a process will lead to reduction in storage losses, leading to financial savings as well as increase in the volume of available grains. Internationally-acceptable level of storage losses, which licensed warehouse operators (either private or autonomous commercial warehousing companies) have to comply with, is between 1 and 2 percent.

The use of the WRS and/or exchanges for procuring and storing strategic grain reserves will give a major boost to the development of these market institutions, reduce market distortions and thereby enhance incentives for increased production. It will also reduce pressure on governments’ budgets required to maintain the reserves. For instance, governments can obtain inventory-backed credit to procure grains for storage, allowing it to build up adequate stocks without tying up critically-needed resources. It may also issue over-the-counter put options to depositors, who can then obtain inventory finance more readily – governments will only be required to finance the associated contingent liabilities if grain prices fall below a pre-determined threshold.

If governments opt for the development and use of the WRS and related exchange infrastructure, then it is important that they pursue measures that engender confidence among market players regarding the stability and predictability of agricultural trade policies. This may include establishing strong consultative platforms for regular dialogue with stakeholders

on when and how it can intervene. Furthermore, governments need to invest in improving the quality and timeliness of crop forecasts in order to ensure that any interventions are based on sound data and information.

4. Conclusion

Despite frustration with the slow or limited progress in developing WRS and other related exchange infrastructure, governments and private sector players in ESA and other African countries continue to show interest in them. Successful WRS initiatives, especially in Tanzania, confirm as discussed in this paper WRS can contribute to raising agricultural output and productivity by helping to address many of the marketing and financing constraints in the farm sector. As a market institution, WRS can reduce transaction costs and strengthen the capacity of local and regional markets to absorb surpluses so as to sustain increase in output and avoid precipitous price plunges which dampen producer incentives. The prerequisites for successful development of WRS in the region are outlined in the paper, noting that some of the challenges encountered can be tackled through closer collaboration between governments and the private sector. For instance, it is possible to ensure a network of well-run warehouses if state-owned warehouses and silos are leased to licensed private operators through a transparent bidding process as happens in Zambia. Though the facilities remain in public ownership, the operation is by credible private parties operating in a competitive market and the services are available to all players in the agricultural sector.

Trade-friendly commodity standards which minimise storage losses and foster trade-by-description need to be harmonised to facilitate trade within the regional markets. Existing MIS need to be improved to ensure dissemination not only of price data but also information on supply and demand, including reliable and timely crop forecasts. Steps can be taken to ensure that smallholder farmers, who dominate agricultural production in most countries in the region, effectively utilise and benefit from the WRS as has occurred in Tanzania. These steps include strengthening primary-level farmers organisations and strengthening their capacity to undertake collective marketing using modern market institutions. What appears to be the most intractable challenge, however, is policy uncertainty. It has proved more of a binding constraint than lack of specific warehouse legislation. To address this challenge, the paper suggests that governments consider using WRS for procuring and storing strategic grain reserves. Such a policy shift from relying exclusively on public institutions for such services will not only boost prospects for successful development of WRS but also reduce the pressure on government budget and market distortions that occur as a result of the management of strategic reserves. Furthermore, governments need to avoid market interventions such as ad hoc export bans which undermine the development of WRS, especially for the politically sensitive grains.

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