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**THE ROLE OF WAREHOUSE RECEIPT SYSTEMS IN ENHANCED
COMMODITY MARKETING AND RURAL LIVELIHOODS IN
AFRICA**

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ABSTRACT

Most African countries have, since the 1980s, liberalised agriculture without experiencing food crisis, as feared by sceptics, but the outcome of reforms has been rather disappointing and agricultural markets remain under-developed and inefficient. One means to improve agricultural marketing, which is the focus of this paper, is to develop regulated warehouse receipt (WR) systems. The system will curtail cheating on weights and measures; ease access to finance at all levels in the marketing chain; moderate seasonal price variability and promote instruments to mitigate price risks. It will also reduce the need for Government to intervene in agricultural markets, and reduce the cost of such interventions if needed.

The major problem in establishing WR systems in Africa is disabling elements in the policy environment. Drawing on experience from projects implemented in Africa during the last decade¹, the authors outline how this challenge can be addressed, the most crucial being to build strong stakeholder support behind the initiative.

1. Introduction

Since the late 1980s, agricultural systems in most of Sub-Saharan Africa (SSA) have been liberalised. Pervasive interventions by the state in supply of farm inputs, provision of agricultural credit and produce marketing systems have been reduced and the scope for private sector provision of agricultural services expanded. The interventions had become an unsustainable fiscal burden, contributed to real decline in producer prices as producers often bore the cost of such programmes, and failed to produce significant increase in per capita food production (Akiyama et al., 2001).

Agricultural market reform in many adjusting countries proceeded under pressure from donors. Quite often, it lacked the full commitment of key policymakers, who had fears about the impact of liberalisation and elimination of subsidies on access to food by low-income households (Jayne and Argwings-Kodhek, 1997). This was because of concern about the capacity of the weak private trade sector to fill the gap created by dismantling or down-scaling public marketing bodies.

In a recent review of literature on the experience of food market liberalisation in Africa, Coulter and Poulton (2001) find no conclusive empirical evidence suggesting that liberalisation led to significant worsening in household food insecurity. The evidence attests to significant gains from the reforms, including increased entry of private traders into the food and agricultural inputs trade, and decline in marketing margins (Jones 1996). However, after a decade or more of reform, agricultural markets in most African countries remain under-developed and inefficient.

This paper discusses one means of improving the performance of agricultural markets in Africa and other developing countries – and thereby enhancing rural livelihoods – through developing *regulated warehouse receipts systems* which are accessible to smallholders. The paper is structured as follows: Section 2 provides an overview of African agricultural markets, showing that imperfect information and high transaction costs prevent efficient agricultural trade. In Section 3, we demonstrate that by reducing these problems, regulated warehouse receipt (WR) systems will improve agricultural commodity trade and finance and positively affect the livelihoods of producers. In Section 4 we review challenges in implementing WR projects in Africa, drawing on practical experience of WR development since 1993, and focusing in particular on a current initiative in Zambia. We set out our conclusions in Section 5.

2. African agricultural markets require support institutions

2.1 The state of African agricultural markets

Agriculture is central to most of Africa's rural population, being their major source of food supply and household income. Production is predominantly by smallholders, often

cultivating less than 2 hectares and is largely rain-fed. There is very marginal use of productivity-enhancing inputs like fertiliser and yields are low and highly variable from year to year.

Food distribution margins and seasonal price variability is high and has remained so in many countries after market reforms. Badiane et al. (1997) observed decline in spatial marketing margins in a number of African countries from the pre- to post-reform period, the most notable being Benin (from 63% to 19%). But spatial margins remain high (21% in Malawi, 23% in Ethiopia and 37% in Ghana). Temporal marketing margins are similarly high, ranging between 32% in Malawi and over 100% in Ghana (Badiane et al., 1997; and Coulter et al., 2000).

Spatial and/or temporal arbitrage is often hampered by lack of infrastructure and other constraints. Storage and transport infrastructure in food markets is poor, and access to commodity finance is limited. Traders face a great deal of risk because of unstable marketing margins, risk of theft and storage losses, difficulty in enforcing contracts, and uncertainty concerning government policy. They also lack institutions and instruments to manage price and other risks. Systems of standard grades and measures are poorly developed, except for a few export crops, making it difficult for more efficient ("sight-unseen) trade to develop. The markets lack transparent systems of price discovery.

Marketing uncertainty, faced especially by smallholders, dampens production incentives, and contributes to stagnation in agricultural output and productivity. High food price variability makes poor consumers in urban and deficit-producing rural areas prone to food insecurity. Improving the performance of agricultural markets will, therefore, enhance the livelihoods of the rural and urban poor, but in many adjusting African economies this is yet to be achieved.

2.2 Imperfect information and transaction costs prevent efficient agricultural trade

Agricultural market reforms in Africa focused primarily on "rolling back the state", the orthodox thinking being that state interventions directly or indirectly create distortions that undermine market efficiency and had to be dismantled (World Bank, 1997). Little emphasis was placed on developing institutions to help the private sector succeed in expanding its marketing activities. However, unlike the ideal market model that underpins market liberalisationⁱⁱ, agricultural markets are constrained by high transaction costsⁱⁱⁱ, imperfect information and incomplete markets.

Transaction costs in the rural trade are high because of the cost of assembling produce^{iv}, and uncertainty about the quality and quantity attributes of goods being exchanged, the result of the absence of effective systems of standard grades and measures. For instance, in Ghana, the average weight of a "maxi-bag" of maize differs from location to location^v. Zambia has a more formalised maize marketing system, but grain sampling is usually by sight and highly subjective. This increases the risk of cheating on weights and quality, and makes physical sampling imperative.

Transactors are often poorly informed. Buyers have limited information about inventories held by rural producers and smallholders lack access to price information from local or regional markets, and are often unable to process complex price-sensitive information when it is available. Formal contract enforcement mechanisms are also weak (Fafchamps, 1996). Hence, the rural trade thrives where trust has been developed on the basis of repeat transactions or informal relationships, creating a significant barrier to entry in large-scale food trade and limiting participation by smallholders in the evolving modern marketing system or in the sub-regional commodity trade.

In the competitive market model, complete sets of markets exist for all goods and services now and in the future (Stein, 1995). However, insurance markets are virtually non-existent in rural areas (Besley, 1994); leaving smallholders facing substantial yield and price variability with little or no access to risk management instruments. This situation increases the credit risk^{vi} of rural borrowers in an economy where the traditional screening devices adopted by banks are ineffective because most transactions are informal. Valuation and foreclosure difficulties also make it difficult for rural borrowers to provide assets acceptable to formal lenders as suitable collateral (Goodland et al. 1999).

These factors limit access to finance for consumption smoothing and contribute to acute illiquidity in the rural economy, forcing most small farmers to sell their produce during the immediate post-harvest period. Rural traders are also under-capitalised and have very limited capacity to absorb the surplus output on the market during this period, leading to a glut which depresses farmgate prices, erodes the purchasing power of poor households, and exposes them to food insecurity during the lean season.

The foregoing suggests that innovations that facilitate market exchange by reducing transaction costs and imperfect information will benefit the agricultural trade in Africa. We demonstrate in the next section that a regulated warehouse receipt (WR) system is one such critically needed innovation.

3. WR system – an institutional device to facilitate market exchange

3.1 What are warehouse receipts?

Warehouse receipts (WR) are:

documents issued by warehouse operators as evidence that specified commodities of stated quantity and quality, have been deposited at particular locations by named depositors.

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 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^{vii}. 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.

3.2 Models of warehouse receipt systems

Grain warehouse receipts were first used in Mesopotamia in 2400 BC and the first form of paper money used in England were negotiable silver warehouse receipts (Budd, 2001). Port warehousing companies and freight forwarders have for long been involved in a relatively simple system, typically found in Africa, under which they offer warehousing services without any regulatory authority oversight. In recent years the local subsidiaries of international inspection companies have increased their involvement, taking advantage of opportunities created by liberalisation of African commodity trade^{viii}. The inspection 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), which allow depositors to secure bank credit. The warehouse receipts are issued directly to the financing bank and not to the depositor, and are not transferable.

By so doing, the inspection companies have filled an important gap in service provision in most developing countries and in the transition economies of Eastern Europe and the former CIS^{ix}. Indeed in a liberalised marketing environment with significant performance and credit risks, they provide the confidence for banks to continue financing import and export transactions, especially because their European-based parent companies have various kinds of professional liability cover that provide additional comfort for lenders. However, there are various limitations to the scope and benefits from the CMAs:

- The main users tend to be large operators, who own or can rent entire warehouses or silos, and can afford fees costing thousands of dollars (US) per month. Services are not available to farmer groups or traders who wish to deposit relatively small volumes of a commodity (e.g. 50 – 100 tonnes).
- The system is predominantly used as a component in financing import and export transactions, but rarely used 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.
- Like other operators, 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 WRs are non-transferable and cannot be used as delivery instruments against contracts.

There have also been attempts by NGOs to establish inventory credit systems for small farmer groups, this being pioneered by TechnoServe in Ghana. TechnoServe's approach brought major immediate benefits to participating farmers but has not proven economically 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 scheme requires

TechnoServe to provide intensive supervision, similar to the above-mentioned CMAs, to give banks comfort. The cost of this is out of proportion to the benefits involved^x. This and other experiences suggest that, to be sustainable, warehousing schemes must appeal to a wider clientele than simply smallholder farmers, thereby building up volumes, reducing unit costs and improving overall system efficiency.

3.2.1 Lack of regulatory system has limited benefits of WRs

Due to lack of any regulatory regime, existing warehouse service providers do not come close to fulfilling the industry's development potential in Africa, except in the atypical cases of South Africa and Zimbabwe^{xi}. Looking at international practice, we find the most comprehensive regulatory regimes in North America (US and Canada) and the Philippines^{xii}. These regimes are concerned specifically with agricultural commodities, and the warehouse operator (or mill in the case of the Philippines) can issue WRs against stock deposited by third parties and also against their own stock, providing a means of rapidly raising funds against inventories. Regulation is very strict and officials are believed to be of high integrity.

In the United States, the system, which is widely credited with streamlining the US agricultural marketing system and, up to the 1950s, playing a critical role in financing and development of the family farm, is organised under the US Warehousing Act of 1916, with subsequent amendments^{xiii}. The law is enforced by Federal and State agencies, whose programmes are described as 'voluntary', in the sense that a warehouse operator (grain elevator) has the choice of being regulated by Federal or State agricultural authorities. Licensed warehouses have to meet and maintain key criteria in terms of physical facilities, capital adequacy, liquidity, managerial qualities, insurance and bonding cover (the latter protects depositors against fraud and mismanagement). Grain handling staff at the warehouses (weighers, samplers and graders) must also be licensed to carry on their activities, and commodities are graded to US standards. Warehouses are subject to unannounced visits by "examiners" who are responsible for enforcing the law and who can literally suspend or revoke a warehouse license overnight. The oversight system is funded by user fees^{xiv} and the Commodity Credit Corporation payments for use of the system for price support purposes - this latter revenue source has diminished in the last ten years.

3.3 The proposed approach for Africa

The North American WR model may not be suitable to Africa for a number of reasons. First, there is the problem of assuring the integrity of the system in countries where public regulatory functions are perceived as weak, and where there is no effective and articulate farmer lobby to rein in a non-performing authority. Second there is the difficulty of overcoming the scepticism of bankers and others who fear that any new scheme will be undermined by pilferage, embezzlement or political intervention. The third challenge lies in ensuring the financial sustainability of a regulatory regime depending on user-fees in countries with relatively low volumes of output of grains and

oilseeds; and to ensuring that smallholder farmers producing small marketable surpluses benefit from the system without having to sacrifice its sustainability.

With assistance from the Common Fund for Commodities (CFC) and other donors, the authors assisted a range of Zambian parties (including farmers, bankers, traders, millers and policy makers), to develop and implement a national warehouse receipts system, using an approach which might prove more widely applicable to other countries of Sub-Saharan Africa (Box 1). The approach involves fostering the development of a national network of privately managed warehouses, issuing transferable warehouse receipts, and where trust is developed through a robust non-Governmental certification and inspection system. The warehouses are required to apply strict commodity grading and weight standards, and electronic documents (electronic warehouse receipts or EWRs) are used with a view to reducing transaction costs and enhancing security. The prime source of income of the certification agency is user fees, though it may be subsidised in its early years.

**BOX 1: THE 'REGULATED WAREHOUSE RECEIPT APPROACH'
CURRENTLY BEING TESTED IN ZAMBIA**

(under the Common Fund for Commodities
grain inventory credit project)

National network of warehouses

Warehousing services are to be accessible to various depositors of different sizes - producers, processors and traders. The network will start in urban areas and along main transport arteries, but expand later to more remote areas capable of producing a marketable surplus. Commodities to be receipted initially are maize, wheat and soybeans but will later expand to include other storable staples and export crops.

Robust certification and inspection system

A stakeholder-controlled agency, the *Zambian Agricultural Commodity Agency Ltd. (ZACA)*, which is at arms' length from Government, has been established to certify and oversee warehouses, primarily to ensure that its integrity is not compromised by ad hoc political intervention in staffing, and in the issuing and revocation of warehousing licenses.

The certification system is designed to encourage investment in relatively small-scale rural warehousing services, while not compromising the quality of service and trust in the system. A low capital threshold is established (US\$ 50,000 in Zambia^{xv}), with warehouses being able to store up to ten times their net worth. The applicant must also meet solvency criteria, provide a financial performance guarantee, show evidence of professional competence and integrity, and accept frequent unannounced inspections.

The certification agency will ultimately depend on user fees, but is being subsidised in its early years. It seeks to break even in the shortest possible time, by increasing the number of warehouses and the range of crops to be stored.

Commodity grading and weight standards

Only commodities that meet prescribed weight and grading standards are to be receipted. Warehouse operators and their front-line staff (samplers, graders and weighers) are trained and certified in commodity quality and quantity assurance to facilitate enforcement of commodity standards.

System of transferable electronic warehouse receipts (EWRs)

Zambia was able to leap-frog the existing paper-based systems by going directly to an electronic receipt system, which has recently emerged in the USA (so far only in the cotton industry) and the UK (London Metal Exchange). EWRs offer greater security against forgery, are less costly and provide a ready-made audit trail. The leading American EWR provider - IDI of North Carolina - is involved in the *Zambian programme*.

Private sector driven

Certified warehouse operators either own or lease sheds or silos on commercial terms and are free to charge economic storage rates. WR financing is also on commercial terms and does not include 'soft' credit lines from Government or donors.

Building stakeholder consensus and growing policy coherence

Considerable effort is devoted to gaining the commitment of the various stakeholder groups with an interest in the scheme, notably farmers, traders, processors, bankers and policy makers.

Source: Authors

3.4 Benefits of the WR system

The prospective benefits of this system, include facilitating trade, enhancing market efficiency, easing access to rural finance, mitigating price risks, and enabling cost-effective management of public food reserves. These are discussed below:

3.4.1 Facilitating trade

By enabling commodities of known description to be assembled at stated locations, a WR system facilitates impersonal trade by reducing information asymmetry between counterparties. The warehouse operator is able to provide information on inventories available and on demand from major buyers at little or no cost. He also guarantees delivery commodities matching stated and against date contracts.

This is likely to benefit smallholders who can bulk up their crops and sell further down the marketing chain to large traders, processors and to regional markets for a better price. They are able to participate in a modern and efficient commodity market because the system encourages them to comply with commodity standards, which will also curtail cheating on weights and quality.

3.4.2 Enhancing marketing efficiency in agricultural markets

The use of warehouses as delivery locations will allow transparent trade in agricultural commodities to develop - between producers and large traders or processors - thereby reducing the length of the marketing chain and narrowing distribution margins. Producers are also able to defer the sale of produce by making use of inventory credit to satisfy immediate consumption needs. Increased storage by participants in the commodity system will moderate seasonal price variability and reduce trade margins for the benefit of both producers and consumers. Storage will also occur in well-run warehouses or silos, thereby reducing post-harvest losses, which are quite substantial in SSA and often mean significant loss of income to farm households.

Subsistence producers may not be in a position to take advantage of the system, because they have little by way of surplus to store. However, their capacity to cope with household food insecurity will be improved because with decline in seasonal price variability, the marginal sales they make during the harvest season will command higher prices, and the food the household must "buy back" in the lean season will cost less.

3.4.3 Easing access to rural finance

A WR system will facilitate development of efficient and accessible rural financial systems. By attracting deposits from small farmers and traders, the system will help formalise their trade transactions, enabling a database on their activities to be generated, which will assist banks in evaluating loan requests. Lenders can mitigate credit risks using collateral (the stored produce), which is more readily available to the producer and of better quality than the traditional security that banks in Africa accept (e.g. real estate).

Availability risk, associated with movable collateral, is reduced by the warehouse operator's guarantee of delivery from a stated location, and foreclosure can be simple and low cost, without any resort to the courts, depending on the legal regime^{xvi}. Lenders can minimise the risk of loss of value of the collateral by monitoring movements in its market value and using margining and price risk management instruments (discussed in 3.4.4 below).

Lenders no longer need to monitor a large number of small borrowers but few warehouse operators to assure loan performance. This will reduce monitoring costs and encourage commercial lending to the rural sector, helping to capitalise the rural trade; and in turn, facilitating the development of a competitive national network of service providers in rural areas.

3.4.4 Mitigating price risks

Producers in most developing countries lack the means to mitigate price risk, and this affects their incomes and ability to repay loans. A WR system will facilitate development of simple mechanisms by which producers, lenders and traders can secure of a floor price by locking in a fixed future price. Forward contracts and over-the-counter put options can be used for this purpose, but the former entails substantial performance risks - producers have strong incentives to renege on forward contracts if prices rise significantly above the fixed future price or they may simply fail to deliver according to specification. Warehouse operators can mitigate such risks by guaranteeing delivery against forward contracts.

The development of commodity exchanges makes it possible for producers and lenders to gain access to exchange-traded forward contracts, or more sophisticated price insurance instruments like futures and options. Varangis and Larson (1996) found that this prospect had stirred up interest in establishing commodity exchanges in a number of developing countries. However, the exchanges are often promoted without ensuring that the pre-conditions for success are in place, so that most end up merely as intermediaries with little or no active trading^{xvii}. The probability of success of such exchanges would be greater if linked to licensed warehouses as delivery locations.

3.4.5 Cost-effective management of public food reserves

Food security concerns have been an important factor behind what Jayne et al. (1999) term "second generation" government controls that undermine the development of efficient agricultural markets. Food insecurity has often been attributed to inadequate food production and high food prices, but is increasingly being acknowledged as being a problem of low and unstable household income (Gladwin et al., 2001). Therefore, Zeller and Sharma (2000) advocate a combined range of policy instruments that increase household income, stabilise food prices and improve household access to finance for consumption smoothing.

A WR system will contribute to the attainment of these goals, for instance by enabling farmers obtain better prices through deferring sale or selling further down the marketing chain. It makes smooth consumption possible by easing access to finance and households will benefit from more stable food prices, resulting from improved storage and better managed supply.

Management of reserve stocks will be more cost-effective as the WR system will allow government access to more reliable data on private stockholding, enabling it to forecast shortages more realistically. It will also create a more transparent system for procuring and sell Government stocks, using WRs. Large organisations will no longer be needed to manage strategic food reserves, thus reducing the scope for corrupt practices.

4. Potential difficulties and challenges in applying the regulated warehouse receipts approach

In this section we discuss difficulties and challenges faced in introducing the approach described above and, from experience in Zambia and other African countries, how these can be tackled (summarised in Box 2 below). The issues include disabling elements in the policy environment, legal issues, engendering confidence among bankers, addressing business opposition, scale economies and ensuring smallholder participation.

4.1 Disabling elements in the policy environment

Coulter and Onumah (2001) noted that Governments often resort to ad hoc interventions, which can potentially undermine inventory credit programmes, on food-security grounds. This phenomenon hampered two schemes in Ghana during the 1990s (see Box 3) and contributed to the delayed start in Zambia in 2001 (see Box 4).

Building stakeholder consensus and policy coherence has emerged as critical to reducing, though not eliminating, ad hoc interventions. In the case of Zambia, this approach enabled local stakeholders to effectively counter pre-electoral policy reversals and prevent the project from being derailed. However, consensus building is a long-term endeavour and requires sustained commitment from key stakeholders.

**BOX 2: THE HANDLING OF DIFFICULTIES AND CHALLENGES
ENCOUNTERED WITH THE APPROACH IN ZAMBIA**

Difficulties/Challenges	Solutions
Disabling policy environment	<ul style="list-style-type: none"> • High level of stakeholder participation in project design • Build wider constituency on Government side, e.g. by involving technocrats
Legal factors that detract from or prevent the negotiability of EWRs	<ul style="list-style-type: none"> • Thorough study to identify legal pitfalls, involving local and foreign expertise • Make start under existing legal framework, providing risks are manageable • Legislation at earliest opportunity to ensure full negotiability
Engendering confidence of bankers, insurers and potential depositors	<ul style="list-style-type: none"> • Involving them in the design process • Keep the certification process non-political and non-Governmental. • Use a tested receipt system which minimises risk of fraud and facilitates liquidation of collateral
Warehouses' difficulty in financial and bonding requirements	<ul style="list-style-type: none"> • Lower financial and bonding thresholds and compensate with intensive oversight • Encourage development of local bonding services
Business opposition	<ul style="list-style-type: none"> • Build critical mass of support among key stakeholders, particularly commercial farmers
Scale economies	<ul style="list-style-type: none"> • Start with larger sites in major areas of concentration • Encourage participation of all comers • Involve organisations genuinely representing or supporting smallholders in the project design and implementation
How to increase smallholder involvement	<ul style="list-style-type: none"> • Implement hard-headed outreach strategy, once project enjoys stakeholder confidence
Possible future institutional failure, or hijacking by sectional or political interests	<ul style="list-style-type: none"> • High level of stakeholder participation in ZACA's design and control • Strong external support in early years • Seek stronger equity participation in ZACA as project develops

Source: Authors

BOX 3: DISABLING POLICY ENVIRONMENT AND INVENTORY CREDIT IN GHANA

During the 1990s, there were two pilot inventory credit initiatives in Ghana, one of them involving small farmer co-operatives, and the other involving relatively larger traders storing in state-owned storage facilities. In 1997, both projects were adversely affected by an ad hoc Government decision to grant selected businesses exemption of import duties on white maize in reaction to crop forecast suggesting there would be a major food shortage. The forecast turned out to be incorrect, and the maize import seriously depressed market prices for two years, causing losses to those storing the domestic crop with inventory credit.

Government's reluctance to restructure and/or privatise the malfunctioning parastatal grain marketing agency also caused traders storing with the agency to experience losses, through disappearance and quality deterioration.

Similar observations may be made about the agricultural trade in Kenya; import duties are subject to a discretionary regime of "suspended duties", which reduces private incentives to store, and gives a competitive advantage to any miller who is fortunate enough to have advance knowledge about impending duty changes.

Source: Coulter and Onumah (2001)

BOX 4: PROGRESS IN IMPLEMENTING ZAMBIAN WR SYSTEM AND ITS REPLICABILITY

The Zambian WR system is set for major activity in its full season from June 2002. As at December 2001, two warehouse operators and the EWR system had been successfully tested with the issue of a receipt covering 100 tonnes of soybeans by one of the operators. Staff of the certified warehouses had been trained and certified as competent in grading and sampling of soybeans, maize and wheat and personnel of the regulatory agency (ZACA) trained.

The Zambian banking sector has warmed to the initiative. International grain traders operating out of South Africa are also beginning to show interest, their expectation being that the new system will reduce physical losses and logistical and collateral management costs, as well as increase market liquidity. Processors have become increasingly aware that a certified warehouse "at their front door" will attract more reliable raw material supplies while others take care of financing and price risk. Many commercial farmers were prepared to take a 40% advance on their crop in the 2000/01 marketing season so they could defer sales – but a widely-accessible WR system was not available; only proprietary 'linked' schemes, involving substantial brokerage commissions existed.

The system got off to a late start in 2001 due to the following reasons:

- Difficulties in securing funding for ZACA, exacerbated by pre-electoral political events, and the length of time taken to sort out legal and contractual issues.
- The Zambian maize crop was very short, adding to other deficits in the sub-region, leaving little uncommitted grain for commercial storage.

- Government plans to import maize to cover the national deficit, and subsidise the price by around \$50 (US) per tonne to keep prices at a politically-acceptable level created uncertainty, causing millers to procure on a hand-to-mouth basis.

Certain economic factors favour a successful outcome in Zambia, and distinguish it from many other African countries. There is significant production by large-scale commercial farmers and the prior existence of inventory credit facilities under collateral management agreements run by international inspection companies suggests that the underlying economics are favourable to the establishment of a system of transferable warehouse receipts. Vis-a-vis its neighbours, (Zimbabwe and Malawi), Zambia enjoys relative freedom of trade and movement of currency and the level of seasonal price variability in the leading crop, maize, is very high.^{xviii}

Recent work by the authors in Kenya, Malawi and Mozambique, however, indicate that the approach is applicable in other African countries. The economic logic in Western Kenya and Malawi appears stronger than in Zambia, due to the geographical concentration of production and the availability of under-utilised silo facilities. However, policy issues constitute more significant challenges in these countries.

Source: Authors

4.2 Legal limitations on the negotiability of warehouse receipts

Legal aspects of the WR system need to be carefully studied, with a view to identifying factors which diminish the holder's title to the underlying goods and/or security interest in them. The desirable state of affairs is one where the holder of the receipt need not carry out searches to establish the absence of previous charges on the goods, such as could lead to lengthy litigation. Often this is not the case, but as noted by Coulter and Shepherd (1995), lenders may be able to live with a certain amount of legal ambiguity, where the economics of the scheme are strong enough and they are confident that the practical risks are small, a case in point being silo receipt system that took off in South Africa in 1996.

In the case of Zambia, there is a lack of local custom and practice^{xix} or statute, allowing title of warehouse receipts to be confirmed, so banks need to carry out searches of a kind not required under a fully negotiable system. Stakeholders are, therefore, actively lobbying for legislation that would recognise WRs as documents of title in Zambia.

4.3 Engendering confidence among bankers

Experience in both Ghana and Zambia shows that engendering confidence among bankers is a major challenge. In Zambia, the situation has been transformed since November 2000, from one where the Bankers' Association of Zambia (BAZ) was reluctant to consider the proposed model, to one where an international bank is willing to finance stocks of maize deposited by farmers at an advance rate of 70% of the market value of the crop in US dollars. Two other international banks are showing strong interest.

The keys to this transformation have been involving the banks in the scheme design; demonstrating over time that ZACA is a disciplined and well supported non-political, non-Governmental body; and the use of a tested receipt system, which minimises the risk

of fraud and facilitates liquidation of collateral. Another factor was the participation of bankers with experience in commodity trade and finance (particularly one from a leading South African bank with a local subsidiary in Zambia) in training events organised for bankers and insurers.

4.4 Dealing with business opposition

Some parties may see themselves as losers, at least in the short term, with the introduction of transferable WRs. In Zambia, for instance, two international inspection companies participated for months in stakeholder meetings dedicated to the establishment of the WR system, but later came out in opposition to ZACA. One possible explanation for this about-turn is that these companies were reluctant to adapt their standard CMA 'product'. An even more compelling reason is that they see the new system as opening up their exclusive preserve in the collateral management business to locally-owned companies. However, these companies have valuable skills and international credentials, and are likely to gradually find a way of working within the new scheme, either directly as certified warehouse operators, or in partnership with other operators who cannot meet the certification requirements alone.

4.5 Scale economies

WR systems involve major scale economies, both in terms of managing warehouses and providing regulatory oversight or certification. Indeed the management and regulatory costs associated with 2,000 and 20,000 tonne warehousing sites are not very different. The difficulties of sustaining small-scale NGO schemes were discussed earlier (see Section 3.2).

Scale economies also pose a challenge to the model proposed here. In Zambia it is being addressed by: (a) making the system open to all players including large millers and commercial farmers who should be encouraged to participate from the outset, and; (b) starting with large warehouses in major places of concentration. Large warehousing sites should be prioritised with a view to covering the fixed costs of the regulatory function; smaller sites can then be opened up as long as they cover variable costs and make some contribution to fixed costs. Despite these measures, the estimated cost of ZACA's services is likely to be around US\$0.50 per tonne stored in its third year of operation, far in excess of the cost of mature systems in major producing countries. This compares with the cost of the Ohio State regulatory régime, which was approximately US\$0.08 in 1998. Significantly lower charges may be possible in countries with lower managerial wage levels.

The issue of scale economies calls for further action-research. Through practical experience of schemes like the one in Zambia, it is possible to explore means of reducing costs and ascertain the limits the limits in terms of scale.

4.6 Increasing smallholder involvement

There is no doubt that smallholders will benefit indirectly from the system, through its aggregate impact on price stability and the transparency of price formation. The experience of some developing countries indicates that there is considerable potential for the direct involvement of smallholders in the WR system, especially as members of marketing groups. In India both small farmers and traders deposit crops with warehouses owned by the Central Warehousing and State Warehousing Corporations, even though seasonal price variability is low compared to most African countries. Smallholders have participated directly in a small scheme in Niger, which allowed them access to inventory credit in the form of fertiliser. Smallholder coffee producers are likewise involved in some Latin American countries, for example in Guatemala.

There are major political pressures to fast-track direct smallholder participation in the Zambian project, from donors and Government. The underlying concerns over smallholder welfare are legitimate, but it is important to avoid short-term fixes to the detriment of long-term viability^{xx}. Notwithstanding the positive examples mentioned above, the level and type of direct smallholder involvement in Sub-Saharan Africa remains to be established in practice. Hence, the Zambian scheme may be seen as action-research, the outcome of which will inform long-term strategy for smallholder involvement.

5 Conclusion

Most African countries have liberalised agricultural markets since the 1980s. Though there is no evidence that liberalisation has led to food crisis, its outcome has been rather disappointing especially for the domestic agricultural trade. The markets remain underdeveloped and inefficient, lacking adequate storage and transport infrastructure and strong supporting institutions and instruments that enable producers to manage marketing and price risks. They are characterised by wide distribution margins and very high seasonal supply and price variability. High transaction costs, imperfect information and incomplete markets contribute to inefficiency in agricultural markets in Africa, implying the need for strong non-market institutions to promote fluid and efficient exchange. It is within this framework that we have demonstrated, in this paper, that a regulated warehouse receipt (WR) system is an institutional device that will enhance agricultural trade in Africa by allowing beneficial market transactions that will otherwise not occur to take place.

The system is expected to curtail cheating on weights and measures from which disadvantaged smallholders suffer, and reduce storage losses. It will ease access to finance at all levels in the marketing chain (producer, trader and processor), and encourage injection of much needed liquidity. Trade margins will be reduced and seasonal price variability will be moderated to the benefit of producers and consumers. Producers and other players will be able to mitigate their price risks and participate in a modern and efficient agricultural trade (both locally and in the sub-regions) with certified warehouses guaranteeing contract

performance. Small producers will be major beneficiaries, though the balance between direct and indirect benefits will have to be established through practical experience.

The benefits of the WR system will contribute to improved agricultural commodity trade, reducing market instability and the political risks associated with it. By encouraging a strong and efficient private trade, it will reduce the role of government in agricultural markets. Where strategic food reserves need to be maintained, the WR system will make its management more cost-effective by reducing the organisational infrastructure and funding needed, as well as reducing rent-seeking by public officials.

The most significant challenge in establishing WR systems in Africa remains the disabling elements in the policy environment, particularly ad hoc interventions occasioned by short-term reactions to symptoms of market inefficiency. Overcoming this conundrum is a major challenge in improving African agriculture. One lesson the experience from the Zambian component of the CFC project is that building stakeholder consensus and policy coherence is critical to reducing the risk of disabling Government interventions, and that it is a long haul process. There is more to learn from the Zambian project, as its implementation proceeds, particularly on how to ensure that smallholders participate directly in a regulated national WR system that is also sustainable.

NOTES

ⁱ The authors learnt the valuable lessons discussed in the article through their involvement in: (a) two DFID-funded research projects, from 1992 onwards; (b) DFID-funded monitoring of the implementation of a pilot inventory credit project in Ghana (1993-97), and: (c) the Common Fund for Commodities (CFC) project in Ethiopia, Ghana and Zambia (since 2000). The Zambia component of the CFC project, which is extensively discussed in the paper, has attracted co-financing from the Dutch Government, USAID (initially through ZATAC, the Zambian Agribusiness Technical Assistance Centre), DFID, IFAD (through the SHEMP project) and the United States Department of Agriculture (USDA). USDA provided its support 'in kind', sending an experienced commodity marketing specialist to work with the team. The views expressed are exclusively those of authors and neither represent nor are endorsed in any way by the above-mentioned funding agencies. CFC reserves the exclusive right to the publication, in whatever form, of the results and technical outputs of the Project it has funded.

ⁱⁱ North (1995) and Stiglitz (1993) assert that it is exceptional to find economic markets which approximate conditions in the model. Besley (1994) also argues that, even if the model is portrayed as a desirable state of affairs towards which policy had work, that benchmark is unrealistic.

ⁱⁱⁱ Transaction costs are costs incurred in exchange transactions, including the cost of measuring the valuable attributes of what is being exchanged and in negotiating, monitoring and enforcing agreements related to market exchange (North 1990). Transaction costs tend to rise with the degree of uncertainty or risk surrounding the completion of an exchange.

^{iv} Producers are generally small and widely dispersed.

^v The average weight is 135kg; 130kg and 125kg at the farmgate, major wholesale markets in the surplus-producing regions of Ashanti and Brong Ahafo and major retail markets in the south respectively.

^{vi} Bessis (1998) defines credit risk as the risk that a borrower will default or will be unable or fail to comply with debt service obligations.

^{vii} 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.

^{viii} Most of these are companies with headquarters in Europe, including Societe Generale de Surveillance (SGS), Bureau Veritas, Socotec/ITS and Audit Control and Expertise (ACE).

^{ix} Far from being a recent innovation, it should be noted that SGS started fulfilling this role before World War I in the grain trade between France and Russia.

^x A more favourable conclusion might be drawn by weighting benefits to the small farmers in the light of their social, i.e. poverty-alleviating, aspect. Notwithstanding one needs to search for ways of achieving the same objectives at lower cost.

^{xi} We consider South Africa and Zimbabwe as 'cases apart' in SSA, because commodity exchanges have established regulatory arrangements for warehouses used for delivery against contracts – in South Africa in 1996 and in Zimbabwe in 2000. The existence of exchange trading in these countries can be attributed to the existence of large-scale commercial farming interests which are lacking in the rest of SSA, as well as to more developed financial systems. The Zimbabwe Agricultural Commodity Exchange (ZIMACE) was recently closed down by Government, leading to the suspension of its silo certificates programme.

^{xii} Discussed in Case Study I in Coulter and Shepherd (1995).

^{xiii} It is significant that this centrally-controlled system was developed in the United States, because it shows just how seriously legislators and officials took the limitations of the neo-classical market model.

^{xiv} The fees are assessed on the basis of the certified storage capacity of each warehouse.

^{xv} This contrasts to minimum net worth requirements of upwards of US\$1 million established by the South African Futures Exchange (SAFEX) and the Zimbabwe Agricultural Commodity Exchange (ZIMACE).

^{xvi} In many countries WRs are transferred to lenders under pledge, an arrangement whereby title to the goods remains with the borrower. However, the authors find lawyers in several African countries favouring full transfer of title under mortgage, since in the event of default this allows the lender to rapidly realise the asset without risk of drawn-out legal battles.

^{xvii} Zambia has 3 so-called agricultural commodity exchanges and Ghana 2, but no significant trading occurs on their floors.

^{xviii} Coulter et al. (2000) found that the average real increase in wholesale maize prices over a six-month period was 80% between 1994/95 and 1997/98.

^{xix} Though in such cases Zambian courts sometimes refer to foreign custom and practice.

^{xx} Fortunately, in Zambia, ZACA has important allies sharing a similar vision in the Zambia Agri-Business Forum (ABF), an association of companies and NGOs concerned with smallholder outreach with which it would work in the run-up to the 2002.

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