

Improved marketing methods ensure smallholder access

RIU

Validated RNRRS Output.

Regulated warehouse receipt systems (WRSs) are helping to combat persistent problems in agricultural marketing and credit systems in sub-Saharan Africa. Such problems include highly variable seasonal prices (especially for staple grains), cheating on weights and quality, and limited access to credit. They stem from a lack of efficient storage facilities, poor rural transport, poorly developed systems of standard grades and measures, unreliable market information systems and lack of collateral for bank loans. WRSs address many of these issues, to the benefit of both producers and consumers. The systems are open to all players and include specific mechanisms to ensure access by smallholders. They are being applied in Ethiopia, Ghana, Uganda, Tanzania, Zambia and Zimbabwe, as well as in Bulgaria, Kazakhstan, Moldova, Poland and Russia.

Project Ref: **CPH18:**

Topic: **5. Rural Development Boosters: Improved Marketing, Processing & Storage**

Lead Organisation: **Natural Resources Institute (NRI), UK**

Source: **Crop Post Harvest Programme**

Document Contents:

[Description](#), [Validation](#), [Current Situation](#), [Environmental Impact](#), [Annex](#).

Description

CPH18

Research into Use

NR International
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Geographical regions included:

[Ethiopia](#), [Europe](#), [Ghana](#),
[Tanzania](#), [Uganda](#), [Zambia](#),
[Zimbabwe](#),

Target Audiences for this content:

[Processors](#), [Traders](#),

A. Description of the research output(s)**1. Working title of output or cluster of outputs.**

In addition, you are free to suggest a shorter more imaginative working title/acronym of 20 words or less.

Suggested title:

Transforming agricultural marketing and improving access to finance through Warehouse Receipt Systems

2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.

Crop Post-Harvest Programme

3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. As with the question above, this is primarily to allow for the legacy of the RNRRS to be acknowledged during the RIUP activities.

- **R6344** – to review post-liberalisation agricultural marketing and credit systems in semi-arid production systems in **Sub-Saharan Africa** (SSA) and identify opportunities to improve them.
- **R6768** – to study the economics of warehousing and assess the potential to use warehouse receipt systems to improve agricultural marketing and finance. The studies were undertaken in Ghana, Kenya and Zambia.
- **R7013** – to study different models of warehouse receipt systems in order to determine which are most appropriate in the context of **SSA** and the prerequisites developing such systems. The countries studied were South Africa, Tanzania, Uganda, Russia, Hungary, Poland, USA, Brazil, Colombia and Argentina.

This cluster of project was led by **The Natural Resources Institute**, University of Greenwich at Medway, Central Avenue, Chatham Maritime, Kent, ME4 4TB, UK.

NRI research team included **Jonathan Coulter** (Leader) and Gideon Onumah (Lead contact: tel: 44 16343263, email: G.E.Onumah@gre.ac.uk).

Independent local consultants assisted the team, which also collaborated with a number of public and private sector organisations involved with agricultural marketing.

Details of individuals and institutions with whom NRI collaborated in piloting the WRS in Ghana included:

- Ministry of Food and Agriculture (MOFA), Policy Planning, Monitoring and Evaluation Directorate.

- Ghana Food Distribution Corporation (GFDC)
- Societe Generale de Surveillance (SGS, Ghana Ltd).
- Agricultural Development Bank (ADB).
- Barclays Bank (Ghana) Ltd.
- Grain Marketing Association of Ghana (GMAG) – six of its key member-grain-traders participated, lead among which were Yawheh Salom Farms Ltd., Letus Produce Co. Ltd., Maduco Ltd., CASHPRO and Joseph Foresight Ltd.
- Local banking and legal consultants as well as an Agricultural Economist (Dr. E.O. Asante of GIMPA).

4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced? (**max. 400 words**). This requires a clear and concise description of the output(s) and the problem the output(s) aimed to address. Please incorporate and highlight (in bold) key words that would/could be used to select your output when held in a database.

The review of agricultural marketing and credit systems in SSA concluded that though liberalisation had created more space for the private sector, inefficiencies persist, which continue to hamper trade and productivity enhancement. For instance, seasonal prices, especially for staple grains, are highly variable; considerable cheating on weights and quality occur to the detriment of producers; and access to credit is very limited. Factors contributing to this situation include lack of efficient storage facilities, poor rural transport infrastructure, poorly developed systems of standard grades and measures, unreliable market information systems and lack of collateral for bank loans. This experience has persisted in most countries in SSA (Coulter and Onumah 2002) as well as in some South Asian countries (Hubbard 2003).

Principal outputs from the cluster, intended to help address the agricultural marketing and finance constraints identified above, were:

- **Service:** The seminal output was that a **regulated warehouse receipt system (WRS)** can simultaneously help make agricultural marketing more efficient and improve access to finance. The system can help to moderate seasonal price variability to the benefit of producers and consumers; and create the basic framework for establishing vibrant commodity exchanges, which many SSA countries have been struggling to promote. The WRS model advocated by NRI was intended to be open to all players – with specific mechanisms developed to assure access by smallholders to the services provided. Commercial service delivery is also stressed to ensure long-term sustainability.
- **Policy:** The prerequisites for developing WRS were identified, key among which is a supportive regulatory and policy environment. It was observed that the most significant challenges in establishing WRS are disabling elements in the policy environment, particularly ad hoc interventions occasioned by short-term reactions to symptoms of market inefficiency.
- **Methodology:** Based on the research findings, NRI advocated a process approach in promoting receipt systems. The approach places emphasis on the specific context in countries and commodity sectors, rather than the imposition of generic blueprints, in the

design and implementation of WRS project. This approach is inherently flexible, allowing for changes to be accommodated as implementation evolves. It is also premised on strong local leadership in the development of sustainable receipt systems, with especially by the private sector playing a lead role. External technical assistance has to be focused on providing technical guidance to local stakeholders in making strategic design and implementation decisions.

5. What is the type of output(s) being described here?

Please tick one or more of the following options.

Product	Technology	Service	Process or Methodology	Policy	Other Please specify
		X	X	X	

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

The research studies originally focused on durable agricultural commodities, particularly staple grains, which are predominantly traded in domestic markets. However, the outputs have subsequently proved applicable to durable export commodities (cotton and coffee). With some adaptive research, focusing in particular on appropriate temperature-controlled storage facilities systems, harvesting and post-harvest management systems as well as quality standards, there is potential for application to perishables. This will be particularly helpful in improving supply chains for locally-produced fruits and vegetables. Such improvements are critical in ensuring that local producers can exploit new marketing opportunities created by the growing importance of supermarket chains in developing countries.

7. What production system(s) does/could the output(s) focus upon?

Please tick one or more of the following options. Leave blank if not applicable

The outputs are **relevant to most of agricultural production systems** in developing countries in Sub-Saharan Africa and South Asia. They are also relevant to South America and the transition economies of Eastern Europe.

Semi-Arid	High potential	Hillsides	Forest-Agriculture	Peri-urban	Land water	Tropical moist forest	Cross-cutting
X	X					X	X

8. What farming system(s) does the output(s) focus upon?

Please tick one or more of the following options (see Annex B for definitions).

Leave blank if not applicable

The research projects learnt lessons from different receipt systems **applicable to a wide range of farming systems**. The outputs are therefore relevant to most of the farming systems in developing countries in Sub-Saharan Africa and South Asia as well as in South America and the

transition economies of Eastern Europe.

Smallholder rainfed humid	Irrigated	Wetland rice based	Smallholder rainfed highland	Smallholder rainfed dry/cold	Dualistic	Coastal artisanal fishing
X			X	X	X	

9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)? (**max. 300 words**).

The essential building blocks of the regulated WRS, validated under this cluster of projects as appropriate to SSA and most developing countries, include the following: efficient warehouse/storage management; reliable market information systems (for the benefit of producers, traders and lenders); trade-friendly and enforceable standard grades and measures for storable commodities; and effective farmer organisations that facilitate access to remunerative markets, credit and inputs. Successful promotion of WRS also requires the creation and maintenance of a supportive policy and regulatory environment. For this reason, outputs and lessons from other projects carried out under the RNRRS, including those listed below, can complement outputs from this cluster of projects.

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

The main clusters from the circulated list of RNRRS projects, where synergy exist with the WRS cluster, include the following:

Crop Protection Programme:

- R8429/R8281: Linking demand with supply of agricultural information – led by B. Pound (NRI).

Crop Post Harvest Programme

- R8182/R8418: Participatory market chain analysis – led by Dr. Andre Devaux, CIP, Peru.
- R8275: Farmer access to markets – led by Dr. A. Doward, Imperial College, Wye.
- R8274/R8498: Farmer access to markets – led by Dr. A. Agona, Kawanda Agricultural Research Institute, Uganda.
- R7151: Market information tools – led by Dr. Nigel Poole, Imperial College, Wye.
- R8250/8114: Market information tools – led by U. Kleih, NRI.
- R7494: Market information tools – led by Dr. John Orchard, NRI.
- R8422: Market information tools – led by L.T. Nsemwa/Dr. Nick Lyimo, Uyole Agricultural Research Institute, Tanzania.
- R7502/R6306: Decision tools for institutional change in public and private sectors – led by R. Lamboll (NRI).

Validation

B. Validation of the research output(s)**10. How were the output(s) validated and who validated them?**

Please provide brief description of method(s) used and consider application, replication, adaptation and/or adoption in the context of any partner organisation and user groups involved. In addressing the “who” component detail which group(s) did the validation e.g. end users, intermediary organisation, government department, aid organisation, private company etc... This section should also be used to detail, if applicable, to which social group, gender, income category the validation was applied and any increases in productivity observed during validation (max. 500 words).

The methodology used during the studies included:

- a) Desk review of various experiences mainly from secondary sources. The outcome informed the selection of countries for subsequent field studies.
- b) Field surveys in selected countries, involving semi-structured and unstructured interviews with established groups of smallholder farmers, extension staff, NGOs, government officials, traders, researchers and other private sector players, including bankers and insurers. The field surveys were undertaken by NRI researchers working closely with local consultants and stakeholders.
- c) Institutional analysis of the organisations involved in the different links of the supply chain for agricultural commodities.

Subsequent validation of the outputs was carried out using the following methods:

- d) Holding multi-stakeholder workshops during which the outputs were discussed. Participants included farmer organisations, NGOs, government departments, traders, researchers and associations of bankers and insurers.
- e) Pilot testing of the output, initially in Ghana – details of which are discussed below. Outputs from the Ghana pilot influenced the design of projects to pilot WRS in other African countries, which are discussed in **Section C**.

Local stakeholders who participated in the Ghana pilot included:

- Ministry of Food and Agriculture (MOFA), Policy Planning, Monitoring and Evaluation Directorate.
- Ghana Food Distribution Corporation (GFDC).
- Societe Generale de Surveillance (SGS, Ghana Ltd).
- Agricultural Development Bank (ADB).
- Barclays Bank (Ghana) Ltd.
- Grain Marketing Association of Ghana (GMAG) – six of its key member-grain-traders participated, lead among which were Yawveh Salom Farms Ltd., Letus Produce Co. Ltd., Maduco Ltd., CASHPRO and Joseph Foresight Ltd.
- Local banking and legal consultants as well as an Agricultural Economist (Dr. E.O. Asante of GIMPA).

The main conclusions from the review of agricultural marketing and credit systems in **SSA** (R6344) were

subsequently validated by studies independently undertaken by **IFPRI** (Kherallah *et al.*, 2002), **Michigan State University** (Dembele, N. and J. Staatz, 2002; and Jayne *et al.*, 2002), and **other UK researchers** (Dorward *et al.*, 2004). These studies confirmed that post-liberalisation agricultural finance and marketing systems in most developing countries suffer from a myriad of constraints that increase marketing margins – making consumers pay more for food while reducing farm-gate prices, thereby limiting the ability of small-scale farmers to adopt farm technology that can raise productivity and reduce poverty.

Conclusions about the potential role of WRS in improving the performance of agricultural finance and marketing systems were validated through **pilot testing** in Ghana. Also undertaken was a comparative assessment of an inventory credit scheme, implemented by an NGO (Technoserve) which exclusively targeted smallholder farmers. The main outcomes were:

- **WRS** that is accessible to different **players of varying sizes is feasible**, but **scale economies** need to be achieved.
- **Collateral management systems**, perceived as **credible** by lenders, is required to attract and sustain availability of **commercial inventory-backed finance**, thus making the system **sustainable**.
- An **enabling policy environment** is critical to the success of the WRS.

Details of the outcome are provided in the next sub-section.

11. **Where and when** have the output(s) been validated?

*Please indicate the places(s) and country(ies), any particular social group targeted and also indicate in which production system and farming system, using the options provided in questions 7 and 8 respectively, above (**max 300 words**).*

As reported above (Q.10), the initial validation involved pilot testing of the WRS in the grain surplus-producing areas in **central Ghana**.

- The pilot warehouses were located in major market towns in the surplus-producing areas rather than in the villages, as was the case with the model piloted by Technoserve.
- The main depositors were medium-scale grain traders, who were able to obtain working capital finance secured against grain inventories, and were enabled to substantially scale up their operations – stocking up to five times their usual annual throughput.
- **Incremental income** accruing to depositors from intra-seasonal stockholding using the WRS was about **75%** of wholesale price during the harvest season – derived by deducting conditioning/handling cost and carrying cost (storage fees plus interest charges) from wholesale price after eight months of storage.
- The grains stocked were procured from smallholder producers, who dominate grain production in Ghana. Farmers would indirectly have benefited in terms of relatively higher harvest season prices – average increase in wholesale prices in the major grain markets in which the WRS was piloted rose by about 90% in the first three months after the harvest, compared to average rise of 40-50% over the same period.
- Smallholder farmers mainly participated in the Technoserve pilot and could have enjoyed similar returns from intra-seasonal storage. No large-scale farmers participated in the pilot (they are rather marginal in grain production in Ghana).
- Commercial finance was provided with no project guarantees based mainly on the collateral management

arrangements instituted. ADB provided financing of about US\$2.9 million for the programme. Based on its positive experience, it later extended financing of about US\$4.2 million against stocks of frozen fish. The risk-adjusted return on inventory-backed lending was very attractive to the banks.

- The pilot led to interest in pursuing market-development programmes such as: promoting standard grades and measures for grains; addressing legal issues that constrain inventory-backed finance; and improving market information systems. However, disabling policy elements made it difficult to further develop the WRS.

Current Situation

C. *Current situation*

12. *How and by whom are the outputs currently being used? Please give a brief description (max. 250 words).*

Warehouse Receipts Systems (WRS) were generally perceived as a means of improving access to credit, hence the descriptive title “inventory credit system”. However, following the pilot, and in part due to the outcome from it and other WRS pilots, the role of the system is increasingly being seen as an essential institutional component in programmes to modernise and improve the efficiency of agricultural marketing systems. There is growing recognition of its importance in ensuring that smallholder farmers can participate in and benefit from the development of modern and efficient agricultural marketing systems.

Some of the programmes/initiatives under which the WRS has emerged as an important element include the following:

- Projects to improve grain marketing systems in developing countries and transition economies with funding by the Common Fund for Commodities (CFC), USAID, European Bank for Reconstruction and Development (EBRD) and IFAD.
- As part of general market reforms – African Ministers of Trade at a meeting in Arusha, Tanzania (November 2005) resolved that African Governments should develop WRS as part of programmes to improve agricultural commodity marketing. The Government of Malawi is to set up a WRS as part of general market reforms, including the restructuring of the Agricultural Development and Marketing Corporation (ADMARC – a parastatal).
- WRS projects to improve marketing of agricultural export commodities – funded by CFC.
- WRS as an essential building block in setting up vibrant agricultural commodity exchanges – private sector players in South Africa and Zimbabwe established South African Futures Exchange (SAFEX – its Agricultural Division) and the Zimbabwe Agricultural Commodity Exchange (ZIMACE – now defunct as a result of policy intervention) on the basis of trusted WRS. The Governments of India and Uganda contracted NRI to advise on developing WRS as part of efforts to improve the performance of local agricultural commodity exchanges.
- Projects to improve access to agricultural and rural finance – IFAD and USAID.

Additional details on some of these programmes and projects are provided below in response to Question 13)

13. *Where are the outputs currently being used? As with Question 11 please indicate place(s) and countries where*

the outputs are being used (max. 250 words).

Current application of the outputs in developing WRS include the following:

- **Grain Market Improvement Projects:**
 - Funded by in EBRD Poland, Bulgaria and Kazakhstan – implemented by ACDI/VOCA.
 - Funded by USAID in Moldova – implemented by CNFA (consulting firm).
 - Funded by CFC in Russia (implemented by Day Robinson International) and in Ethiopia, Ghana and Zambia (implemented by NRI).
 - Funded by EU in Uganda to enhance the role of the Uganda Commodity Exchange in the marketing of grains in Uganda and the sub-region – being implemented by GFA (a European consulting firm).
- **Improving marketing of agricultural export commodities:**
 - Funded by CFC in Tanzania, Uganda and Zimbabwe and implemented by UNOPS, with NRI as technical advisors.
- **Projects to improve access to agricultural and rural finance:**
 - Funded by IFAD in Tanzania, Zambia and Ghana (with smallholders being the primary targets).
 - Funded by USAID in Uganda (with smallholders being the primary targets).

Details on outcome of WRS projects in Zambia and Tanzania, where NRI provided technical advise for implementation are provided in response to Question 14. In both cases, sufficient progress has been made to mainstream WRS in the agricultural marketing and finance systems.

14. What is the scale of current use? Indicating how quickly use was established and whether usage is still spreading (max 250 words).

Zambia WRS – for grains (maize, wheat and soybean)

Project launched in 2000 and by the end of the 2004/05 season:

- An arms-length warehouse regulatory agency – Zambia Agricultural Commodity Agency (ZACA) – established to certify and oversee operators.
- Four certified warehouses participating – total storage space of 120,000 tonnes.
- 65,900 tonnes of maize deposited – 5,850 tonnes deposited by smallholder groups (who obtained financing against 2,100 tonnes).
- About US\$3.10 million inventory financing by four banks: Intermarket Discount House, Barclays Bank, Standard Chartered Bank and Stanbic Bank.
- Excellent repayment – no cases of loan default reported.

Tanzania WRS – for export commodities (coffee and cotton)

Project launched in 2000 and by the end of the 2004/05 season:

- Trust-based system but supportive legislation was passed in April 2005, paving way for establishment of

regulatory agency.

- Designated operators are five coffee curing factories and one cotton ginner.
- Depositors include over 50 primary cooperative societies, one cooperative union and six (6) private companies during the 2003/04 season.
- Total deposits of 13,600 tonnes of parchment coffee (Arabica) and 900,000 kg of seed cotton (by one cooperative).
- Financing equivalent to US \$10 million provided by CRDB Bank and Kilimanjaro Cooperative Bank against stored coffee.
- Excellent repayment – no cases of loan default reported.
- Participating coffee farmers could market directly at the Moshi Coffee Auction (without any intermediaries), thereby obtaining incremental income of 45-70% of what non-participating farmers received. The cotton farmers' cooperative in 2005 directly sold cotton lint (instead of seed cotton) to UK-based importer, generating sufficient income over a period of three years to finance expansion of production by about 4 hectares per member.

15. *In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key facts of success? (max 350 words).*

Based on the experience from this cluster of research studies as well as the successful WRS pilots, some of which have been discussed above, we identify the following among the factors that are critical to the promotion of WRS which is sustainable as well as accessible and beneficial to often-marginalised players such as smallholder farmers and small-to-medium scale traders:

- The existence of a network of suitable warehouses in locations accessible to depositors and potential off-takers.
- Trusted collateral management systems that allow issuing of warehouse receipts by only credible operators – with technical competence to store the requisite commodity as well as sufficient networth and insurance to cover storage losses.
- Warehouse legislation may be useful but has proved not to be essential.
- Reliable and enforceable commodity standards (grades and measures).
- Delivery of economic lot sizes by depositors – this can be achieved relatively more quickly where commercial producers, large-scale traders and processors participate and/or where well-organised smallholder producers and traders are involved in the programme.
- Stable macro-economy, in particular relatively low inflation rates leading to low and affordable interest rates.
- Supportive agricultural trade policies which do not discourage intra-seasonal stockholding.

Where these conditions are not prevalent, they can be created and maintained if there is commitment from Government and key private sector players.

Environmental Impact

H. Environmental impact

24. What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)? (max 300 words)

This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate evidence can be provided in the form of an annex.

There are no direct environmental issues associated with WRS and their impact on output marketing systems. However, it is anticipated that as well-functioning markets emerge with the development of WRS, the improved incentive structure and rising productivity could impact positively on land use and the environment as smallholders will be able to increase household income and better assure household food security without having to extensify production.

Under the WRS, pest control measures are undertaken by qualified operators. This represents fewer health hazards compared to control measures undertaken by less trained individuals. Furthermore, the requirement that the operators are regulated by appropriate agencies will ensure that pesticides used have minimum environmental impact.

25. Are there any adverse environmental impacts related to the output(s) and their outcome(s)? (max 100 words)

No known adverse environmental impacts are associated with the WRS.

26. Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience? (max 200 words)

Climate and natural disasters expose producers, especially smallholder farmers lacking the technological means to mitigate these risks, to significant output losses or even total crop failure. If in addition to these risks, inefficient marketing systems undermine post-harvest crop management as is currently the case in many countries in Africa and South Asia, then smallholders become even more vulnerable to income shocks and, along with poor consumers in food deficit rural and urban areas, to severe food insecurity. These risks will also make smallholder farmers even less attractive borrowers for formal financial intermediaries. The WRS helps to mitigate the impact of these risks by improving the marketing of output produced and improving access to finance by smallholders to finance that may be needed when households have to recover from such shocks.

Annex

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