FAO/World Bank workshop on reducing post-harvest losses in grain supply chains in Africa

FAO Headquarters
Rome, Italy
18–19 March 2010

Lessons learned and practical guidelines

THE WORLD BANK

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1. BACKGROUND

Most countries in Africa and most notably the low-income, food-deficit countries (LIFDCs) have become especially concerned about the global food situation and outlook in recent years. While the proximate cause of this heightened concern was the surge in food prices that began in 2006 and peaked in mid-2008, concerns remain for other reasons, among them the higher market prices that now seem to prevail, continuing price volatility, and the risk of intermittent food shortages. For lower-income sub-Saharan Africa countries, contributing factors to the feeling of increased food insecurity include persistently low agricultural productivity, difficulty in adapting to climate change, inability to handle the financial burden of high food and fuel prices in the context of limited access to credit, and an increased dependence on food aid. Yet there is an additional, oft forgotten factor that exacerbates food insecurity. Post-harvest losses (PHL), which can and do occur all along the chain from farm to fork resulting in higher prices and lost revenue which reduces real income for producers and consumers and especially the poor, since such a high percentage of their disposable income is devoted to staple foods. It is now increasingly realized that reducing PHL along food chains can, in certain cases, provide a more cost-effective and environmentally sustainable means of promoting food and nutrition security than investments focusing on increasing production. It can serve to reduce the wastage of scarce production resources (land, water, inputs) thus ensuring more sustainable food supplies. However, despite considerable knowledge about the topic, accurate figures are lacking on actual levels of PHL (both qualitative and quantitative) occurring in sub-Saharan Africa. In addition, as far as technologies for PHL are concerned, it is not clear what factors determine their adoption at local levels and up and down the value chain.

The profile of PHL has been significantly raised in the aftermath of the recent food and financial crises and interventions in PHL reduction are seen as an important element of the efforts of many agencies to reduce food insecurity in Sub Saharan Africa. This is particularly so for grains which constitute the basis for food security for the majority of the population in the region and a vital component in the livelihoods of smallholder farmers. For cereal grains alone, one estimate[1] puts the value of quantitative PHL in the continent at more that US$4 billion annually. Of even greater significance are qualitative PHL which take the form of reduced revenues due to quality and market opportunity losses. PHLs also have an impact on the nutritional value of grains and have resulted in adverse effects on the health of populations consuming unsafe food, notably those contaminated with aflatoxins. In the light of the soaring prices in 2007/08 and the risk of food shortages in the future, investments in reducing post-harvest losses are seen as a potentially cost-effective and environmentally sustainable option to enhance food security of especially vulnerable populations.

[1] Framework Paper: Programme for Postharvest Losses Reduction in Africa 2010-2014. African Development Bank. 2010.

1.1 Objectives of the Workshop

Based on the above, FAO's Rural Infrastructure and Agro-Industries Division (AGS) and the Agricultural and Rural Development Department (ARD) of the World Bank organised the present workshop. The objective of the workshop was to bring together experts on the subject of PHL reduction, to discuss the significance of the issue, past experiences, and identify appropriate future interventions in sub-Saharan Africa.

Specifically the workshop aimed to:

1. Review current knowledge on the magnitude and nature of grain PHL, identifying more clearly the scope of the problem.

2. Summarize past and on-going activities with respect to PHL along the supply chain, highlighting available options for the achievement of on-farm and community level post-harvest improvements.

3. Drawing on private sector input, identify best practices and institutional arrangements to promote reduced PHL, with a view to guide donors/governments in promoting appropriate interventions.

4. Define the way forward for future collaboration.

1.2 Structure of the Workshop

The meeting was attended by 35 participants from 15 organizations including 6 representatives from the private sector. Discussion was facilitated by structured presentations, question and answer sessions and plenary discussions. Ongoing PHL reduction activities of the various development partners were reviewed and supplemented by technical presentations on:

- technological options for grain storage in Africa;
- warehousing and its relationship to grain PHL reduction;
- the African PHL Information System (APHLIS); and,
- new applications of hermetic storage for grain storage and transport.

A panel discussion was then held involving the private sector participants from the grain sector in Africa. A meeting programme is appended in Annex I and a list of attendees in Annex II.

2. WELCOME AND INTRODUCTORY REMARKS

2.1 Opening of the Workshop

By Mr Geoffrey Mrema, Director, Rural Infrastructure and Agro-Industries Division of FAO

Mr Mrema welcomed all participants to the workshop on behalf of the Rural Infrastructure and Agro-Industries Division, stating that the division considered PHL to be a critical issue in the efforts to tackle both food insecurity and commercialization of grain markets in Africa. He then introduced the Assistant Director-General of the Agriculture and Consumer Protection Department of FAO, who delivered the opening address.

2.2 Opening Address

By Mr Modibo Traoré, Assistant Director-General, Agriculture and Consumer Protection Department of FAO

Mr Traoré welcomed all the participants to the workshop on behalf of the Food and Agriculture Organization of United Nations (FAO). He noted the presence of FAO's development partners: the World Bank, World Food Programme (WFP), International Fund for Agricultural Development (IFAD), United Nations Industrial Development Organization (UNIDO), African Development Bank (AfDB), European Commission (EC), and the Natural Resources Institute of the UK (NRI), as well as private sector participants from the grain industry in Africa. In this regard, he applauded the organizers of the meeting for bringing together all stakeholders/ partners, noting that inputs from all stakeholders were imperative for crafting successful interventions.

In his address, he emphasized the great importance of PHL reduction in the quest to promote food security, alleviate poverty, create income generation opportunities and foster the economic growth of African countries. He said PHL were especially critical for the grain cereals, pulses and oilseeds, as these sectors constituted the predominant staples of many communities in Africa. He mentioned that FAO estimates show that at least 14 million tonnes of quantitative losses in cereals are encountered annually in the Continent, with a monetary value of more than USD 4 billion. He added that when loss in nutritional value and market opportunities are factored in, as well as possible adverse effects on the health of populations consuming poor quality products, the need for interventions to reduce post-harvest losses became obviously clear. He said such statistics and the soaring food prices crisis and the global economic recession of 2007-2009 were a reminder of the necessity for urgent action.

Mr Traoré outlined FAO's systematic involvement in the reduction of food losses, which dates back to the late 1960s with the Freedom from Hunger Campaign. Following the first UN World Food Conference in Rome in 1974, FAO established the Action Programme for the Prevention of Food Losses (PFL) in 1978 which ran through to the early 1990s. The purpose of the Programme was to assist developing countries to identify post-harvest food losses and to implement programmes for the reduction of food losses at the national level through direct action projects. However,

with the dramatic changes over the last two decades in global agri-food systems in general and in Africa in particular (rising per capita incomes, changing technology, trade liberalization and rapid urbanization), FAO, in collaboration with its partners, was taking a new look at the issue of post-harvest food losses and re-aligning its intervention strategies to focus on systemic interventions that improve the efficiency of the chain as a whole, rather than the disjointed, single-point interventions of the past. A common characteristic in Africa is the transition to market-driven systems, with a greater reliance on the private sector and the need for post-harvest loss reduction strategies that provide incentives to all actors in the chain. This raises the importance of appropriate enabling environments to encourage private sector investment and the partnering of the public and private sectors in spearheading growth and development.

Mr Traoré indicated that recent estimates by FAO revealed that of the USD 940 billion that needs to be invested to eradicate hunger in sub-Saharan Africa over the 44-year period to 2050, up to 47 percent will be required in the post-harvest sector to cover investments in cold and dry storage, rural roads, rural and wholesale market facilities and first stage processing. Although the investment needs are substantial, FAO is optimistic they will be realised given the commitment in Africa to invest in agriculture. For instance, at the African Union's 13th Summit of Heads of State and Government, the theme was *'Investing in Agriculture for Economic Growth and Food Security'*. Furthermore, most countries are implementing agricultural strategic frameworks that are in line with CAADP which, through its Pillar 2, is directly related to a policy agenda and programme initiatives for improving infrastructure and gaining market access to local, regional, and extra-regional markets.

Additionally, he shared that he had just returned from Abuja, Nigeria where he participated in the High-level Conference on the Development of Agribusiness and Agro-industries in Africa (HLCD-3A). A key outcome of the HLCD-3A was a unanimous endorsement of the African Agribusiness and Agro-industries Development Initiative (3ADI) which incorporates a programme framework and associated financial modalities to foster the development of agribusiness and agro-industries. The development of agribusiness and agro-industries is a key aspect of any programme targeting reduction of PHL, improving food quality and safety, extending the shelf-life of food, and increasing efficiency along the food chain from production to consumption.

Against this backdrop, he felt that the technical meeting was very timely and there is a critical need: 1) to consider available options for the achievement of improvements in the post-harvest elements of food chains and, 2) to identify best practices and institutional arrangements to reduce PHL. He assured participants of continued technical support from FAO for the formulation and implementation of programme frameworks targeting the reduction of PHL in Africa.

He concluded his address by wishing participants fruitful deliberations and expressing his interest in receiving the recommendations of the workshop.

2.3 Introduction to the Workshop

By Mr John Lamb, Agribusiness Team Leader, World Bank

Mr Lamb provided the context for the workshop, reviewing the proposed substance and expected outcomes, followed by an explanation of the reasons underlying the WB interest in the topic. The institution clearly recognises the importance of enhancing the profile of post-harvest loss reduction strategies and activities within the context of WB programs and its importance is noted in two Bank Global Initiatives: the Global Food Response Programme (GFRP) and a new MDTF the Global Agricultural Food Security Programme (GAFSP). The World Bank's primary interest in co-organizing the workshop was to tap into expert knowledge on major ongoing activities and best practices so as to inform the Bank's operations, while providing a space for the emergence of collaborative initiatives among key stakeholders in this field. Mr. Lamb highlighted that even though PHL is acknowledged as an important issue; the topic is not adequately incorporated into the development agenda and not clearly reflected in agricultural development strategies. Therefore, a better understanding of the scope and nature of the problem, as well as of appropriate interventions is needed; thus ensuring increased financial resources to finance PHL reduction interventions. Past studies/projects may have not had in place a systematic way of measuring impacts in terms of PHLs; consequently, it can perhaps be assumed that many investments may not have been very effective in addressing the issue. The WB past experience with Community Driven Development (CDD) projects suggest that incorporating PHL activities in CDDs-related projects could be an interesting entry point for future interventions in this field.

2.4 Overview of On-going PHL Related Activities (FAO, AfDB, IFAD, WFP, UNIDO and the European Union)

Several other organizations were invited to present an overview of their PHL-related initiatives. The presentations were not expected to be comprehensive but rather to present a general view of the increasing importance of the topic within the portfolio of the organization's investments/activities.

FAO: Activities on post-harvest losses are undertaken through the Organization's normative work and field programme. The normative work involves undertaking studies, and documenting and disseminating information on best practices and lessons learnt. A flagship product in this regard is the web-based Information Network on Post-harvest Operations (INPhO- www.fao.org/inpho/) which holds information on a wide range of post-harvest development issues. The units involved in post-harvest work include: the Rural Infrastructure and Agro-Industries Division (AGS) which has a mandate for post-harvest issues dealing with crops, the Animal Production and Health Division (AGA) which until recently handled post-harvest issues for animal products such as meat and milk (a function now under the responsibility of AGS), and the Fisheries and Aquaculture Department (FI) which handles post-harvest handling of fish. Other units working on post-harvest related issues include the Nutrition and Consumer Protection Department (AGN) which deals with the quality and safety aspects, and the Investment Centre Division (TCI) which handles investment projects and is responsible for the collaboration in this regard with the International Finance Institutions such as the World Bank. The field programme covers pilot and investment

projects involving interventions in the post-production sector of agricultural value chains. Regarding the field programme, FAO has incorporated PHL reduction activities in its work on the up-grading of value chains and linking farmers to markets. AGS promotes the use of improved storage facilities such as metallic silos (e.g. in Indonesia, Afghanistan) while improvements to larger storage facilities are linked to strategic grain reserve, inventory credit and the warehouse receipt system projects. FAO has also implemented training and capacity building projects in Ministries of Agriculture focussing on extension workers and lead farmers. AGS is currently assisting the Ministry of Agriculture in Malawi with a rapid appraisal methodology for PHL which can then feed into the country's food balance sheets. The "Food Security through Commercialization" projects funded by the Italian government also have a component on PHL reduction and related value addition and marketing activities.

African Development Bank*:* AfDB has recently targeted PHL reduction as part of its African Food Crisis Response (AFCR). The organization also considers PHL reduction as an important element of its agro-industry development strategy. The Bank has been working with FAO in preparing its PHL Programme Framework as part of its New Agriculture Strategy 2010-2014. The Bank's agriculture project portfolio was screened to identify opportunities for incorporating PHL reduction, value addition and related marketing activities into on-going projects. In order to prepare the Framework, rapid needs assessment missions were undertaken by FAO and AfDB in a number of countries in Africa while questionnaires were submitted to other countries. The Bank has set a target to reduce PHLs by 3% over the next 6 years. The Bank has indirectly contributed to PHL reduction through its various infrastructure development projects. It envisions adopting a value chain approach for its PHL reduction projects and will 1) screen on-going projects and 2) introduce new projects addressing PHls under a new funding cycle.

IFAD: The main instrument of involvement of IFAD in PHL reduction is through funded projects. In the past, the agency has collaborated with FAO and CGIARs/research organizations in both regional and country level projects/grants. Its projects have a producer organisation entry point, usually within a chain context, which often involves capacity building activities at both policy and technical levels. They place a high priority on understanding how to build capacity at local levels and ensuring coordination between donor activities, particularly through coordinating work on value chain analysis.

WFP: the agency's involvement in PHL reduction is mainly through its grain procurement for food aid under the Purchase for Progress (P4P) programme (see separate presentation).

UNIDO: While using the value chain approach in its agro-industrial development projects, many of the on-going projects are focused on technology transfer and capacity building. The value chain approach is particularly useful when considering the enabling environment. UNIDO is currently working in coordination with FAO/UNCTAD on larger agro-industry development projects.

EU: The EU funds the African Post-harvest Losses Information system (APHLIS). Under its Food Facility pillar (part of its Food Crisis response programme), the EU

has allocated Euros 1 billion for food security-national needs assessment (UN coordination), covering credit, support to increasing production (input supplies) and support to producer associations. The EU has close linkages with the Committee for Food Security (CFS) and the High Level Task Force on Food Security where it provides substantive input.

3. SUMMARY OF STUDIES AND INITIATIVES

This section presents a summary of presentations on initiatives and studies undertaken to appraise the extent of PHLs, key elements of tried approaches and lessons learned.

3.1 The APHLIS Information Platform: A Source of Data on Physical PHLs

By Mr Felix Rembold, European Commission, Joint Research Centre

The African Post-harvest Losses Information System (APHLIS) is a network for the estimation of cereal weight losses in Eastern and Southern Africa at national and provincial levels. APHLIS was created within the work programme of the European Commission's Joint Research Centre in collaboration with the Natural Resources Institute (NRI), ISICAD/BLE, the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the Southern African Development Community/ Food, Agriculture and Natural Resources (SADC/FANR). To motivate the talk and bring attention to the issue of post-harvest losses, a graph was presented which was adapted from a 2008 WFP study comparing cereal production with cereal import requirements, food aid delivered and post-harvest losses in Africa. The graph showed that between 1995 and 2005, post-harvest losses exceeded food aid delivered and losses almost always were more than cereal import requirements.

APHLIS consists of three components:

- A network of local experts from each country in the Eastern and Southern Africa region, which forms the basis of the system. The network members supply the relevant data and verify loss estimates
- A central database holding relevant data by country and province for the calculation of the losses.
- A loss calculator based on a simple model that calculates losses from all provinces of the countries in the region.

Prior to the development of APHLIS, PHL assessments were based on ad-hoc measurements resulting in wide ranges. In APHLIS, loss estimates are derived from the best known estimates of the loss for each point in the post-harvest chain (harvesting, drying, shelling, winnowing, transport to store, storage etc) allowing for crop type, climate and scale of farming (commercial or subsistence). The estimates can be viewed as interactive maps or as tables. PHL tables can be clicked to reveal a complete breakdown of the loss calculation, the sources of the data and an appraisal of the quality of the data used, thus users can scrutinize PHL estimates. Because APHLIS offers a downloadable version of the loss calculator as an Excel spreadsheet, it can be used for simulating different scenarios. Other advantages of the platform are

that it can be easily upgraded as more reliable data becomes available. There is a vision to update APHLIS annually thus, over time, creating a longitudinal dataset allowing for trend analyses. It is important to emphasise that the information platform calculates physical losses only, and does not include any losses arising from deterioration in quality or if food is safe and still fit for human consumption.

In terms of future developments, APHLIS is expected to expand its thematic (to include beans) and geographic coverage (to include West Africa, Asia, Central and South America). It is additionally proposed to combine it with market information such as RESIMAO to provide broader support to the post-harvest community. The presenter highlighted that the long-term sustainability of the platform will need the support/collaboration from other international institutions such as the World Bank, UNIDO and FAO.

Reactions from participants:

- Relevance to FAO– the APHLIS project team is already working with FAO's Global Information and Early Warning System (GIEWS) and more collaboration is envisioned.
- There were suggestions that the platform could be adapted to provide benchmarks of what could be considered normal or acceptable levels of PHL, perhaps in comparison with estimates from other developing countries or through some kind of cost-benefit analysis.
- In terms of commodity coverage, there were suggestions to look at PHLs in fresh produce (e.g. fruits and vegetables), fish, and cassava given the high levels of PHLs encountered in these commodities and their importance in the diets of African communities. However, some participants felt the private sector was already taking care of PHLs in high value crops, noting in particular the Bill and Melinda Gates project on PHL for fresh produce. Another suggestion was to target commodities with high PHLs such as maize and to refine analysis to the varietal level to inform on which varieties were more susceptible to PHLs.
- It was proposed to marry APHLIS with the World Bank/IFAD/FAO platform on responsible investment in the agricultural sector, currently under construction.
- There was concern as to the treatment of missing information in calculating total PHL estimates and also ownership of the system by the countries involved. Sustainability and development of the network needs to be further considered, including its possible incorporation in a national, sub regional or regional institution.
- The EC has estimates on the size of resources needed to scale up the project and ensure its sustainability (approximately € 500 000, in addition to the € 200,000 already spent). Mr. Rembold emphasized the importance of the network in moving the platform forward, in terms of number of people engaged and the quality of information they provided
- Other limitations of the system that were noted include its failure to capture qualitative losses.

3.2 FAO/AfDB Cooperation on Post-harvest Losses Reduction in sub- Saharan Africa

By Julia Seevinck (TCI) and Divine Njie (AGS), FAO

PHL is a priority area of FAO-AfDB cooperation. Cooperation involves two main pillars: (i) screening of the ongoing AfDB agricultural portfolio to ascertain if PHL activities are sufficiently included or could be added, followed by sensitizing and training of AfDB staff and (ii) preparation of a Framework Paper for a Continental Program on PHL reduction in sub-Saharan Africa based on rapid country needs assessments. The screening exercise took place in four countries: Benin (meat and milk); Ghana (horticultural products and cassava); Malawi (maize and vegetables) and Mozambique (fish). The framework paper is based on field missions to six countries and a questionnaire survey in a further eight countries. The studies looked at cross-cutting issues, ranging from storage to marketing information, policy and institutional frameworks, and the major institutions involved in PHLs while providing situation assessments for various crops, including meat, vegetables, fish, and tubers.

The presentation summarized the findings of both the screening exercise and the questionnaire/field missions. It was highlighted that isolated investments do not work and the key findings from the screening exercise are: 1) the need to incorporate value chain analyses to identify critical points where PHL occur along the chain and opportunities for reducing them; 2) that PHL reduction can be addressed through establishment and / or support to farmer organizations, capacity building and infrastructure development based on sound cost-benefit analysis. A key finding of the rapid country assessments was that, although PHL reduction objectives were prioritized in country poverty reduction strategies and other relevant sub-sector strategies, the inclusion of specific PHL reduction activities in these strategies was often missing. A common problem related to PHL in cereals in many countries appeared to be the lack of adequate or suitable drying facilities. A number of interventions were identified for the AfDB to consider but, in line with the latter, the priority is for support for uptake of improved technologies for harvesting, drying, storage and primary processing. Drying facilities are considered particularly important in light of climate change that has sometimes caused wet spells just before harvest resulting in inadequately dried grain leading to mycotoxin formation and poor quality grains.

Reactions from participants:

- Hermetic storage was identified as one technology which could be useful for dealing with problems of high moisture after drying.
- Adequate grain drying was emphasised as a key PHL issue as wet grains allow growth of moulds and production of aflatoxins.
- It was mentioned that the technology exists; the gaps, however, include financing, technical assistance and key attention to economic incentives for adoption.

3.3 World Food Programme's Purchase for Progress Programme (P4P)

By Ken Davies and Bertrand Salvignol, WFP

The P4P program is a five year project (2009-13) which has a geographic coverage of 21 countries, 15 of which are in sub-Saharan Africa. It has a budget of USD121 million for staffing and operations excluding grain costs. The Programme which introduces innovative procurement modalities, such as competitive tenders for purchases from local traders, direct contracting with smallholders, signing forward contracts for 3 years, etc, has an initial target to procure locally some 40 000 tons of grain and has a target to procure 100 000 tons annually. WFP is undertaking 'soft' tendering with farmers groups where it relaxes some of its procurement conditions and supplies bags to farmer groups for purchases of 30-50 tonnes.

The focus of PHL in the programme is through the quality assessment used by WFP in the procurement of grains. Moisture content is a significant factor in grain procurement. Other factors are foreign matters and mycotoxins, particularly aflatoxin in maize. The blue box is a tool used for conducting a series of rapid quality checks at farm level and is considered effective for capacity building of farmers and staff of producer organizations. However, it is not a tool that lends itself to effective testing for aflatoxins. Although WFP is prepared to relax quality standards, food safety is non-negotiable and grain not meeting food safety standards is always rejected. Training in procurement and grain storage is often provided and is done in partnership with FAO and some International NGOs. Through containerised food processing units offered through the programme, producers can also process their grain.

Implementation challenges for P4P are poor access to credit by farmers, weak farmer organizations, insufficient partnerships on productivity and capacity development, low quality of much of the grain and notably, contamination with aflatoxins which is the biggest food safety challenge for WFP. The WFP experience revealed that ensuring grain quality and safety by small holders is a challenge, particularly related to inadequate drying. While direct contracting from small holder farmers is something the organization is willing to do, it will take time for such a mechanism to be fully functional. In order to undertake forward contracting with farmers, a revision in WFP procurement rules is required.

Reactions from participants:

- The question was raised whether WFP should purchase through larger traders who would be buying from small producers instead of directly from farmer organisations? This could be more sustainable in the longer term and would not disrupt existing trading arrangements by making WFP the single market outlet for smallholders
- WFP by laying down understandable, verifiable and strict procurement standards, forces farmers to improve their quality and practices and thereby reduce PHLs.

3.4 World Bank Review: Post-harvest Loss Reduction for Cereal Grain Staples in sub-Saharan Africa

By Mr Rick Hodges and Ben Bennett, NRI

The presentation was a synthesis of the review commissioned by the World Bank and undertaken by NRI on means for improving postharvest grain-supply chains and reducing PHLs. The study is complementary to the FAO/AfDB framework report. It is different from the latter in that it considers only the principal staple grains of relevance to small holder farmers in sub-Saharan Africa (e.g. maize, sorghum, millet and rice) and is focused in the upstream parts of the grain value chain, with particular emphasis on the benefits to farmers and traders. The presentation showed that donor support for PHL reduction has evolved in the last three decades in terms of development aid, intervention and approach. In the 1970s PHL intervention was centred on pushing technologies at specific points in supply chains, such as community stores, but the current focus has changed to adopting a value chain approach, recognising changing marketing or business systems. Through a survey of experts, priority interventions were identified as storage protection, market information, individual farm storage facilities and drying facilities. However, it was noted that this survey was heavily skewed by the predominance of entomologists who responded to the questionnaire. Had a more balanced sample of stakeholders been selected, the response would likely have been different, particularly as it gave the importance of credit a low ranking. The presenters noted that a wide variety of storage facilities is available depending on the situation, acceptability and cost-benefit analysis. From past observations, co-operatives and community grain banks have underperformed while inventory warehousing seems to offer greater potential although its use is still limited.

The review argued that approaches to reduce post-harvest losses may be different, according to the targeted producers – net-deficit producers versus net-surplus producers. Net deficit producers are those that are not in a position to generate a better income from loss reduction and would benefit from subsidized interventions. Notwithstanding the net-deficit producers, the challenge to PHL reduction was adoption of already known technologies and the existence of appropriate institutional arrangements that would support their up-take. It was recommended that careful socio economic appraisals and involvement of stakeholders be exercised in crafting future interventions to ensure that interventions were both needed and acceptable. For sustainability of interventions the recommendation was to plan on long-term interventions (10- 15 years) and to seek gender and diversity sensitive approaches. Women are already major users of credit schemes in Niger and Madagascar and there is evidence of a positive impact from the PostCosecha in Central America in engaging women in PHL reduction. Future interventions should ideally be executed through partnerships between the public and private sectors, and should be demand driven and led by the African countries themselves rather being driven by aid agencies and institutions in developed countries.

The speaker noted the dearth of information on PHL reduction interventions, erosion of the institutional memory on the subject and lack of awareness of activities being undertaken by various stakeholders. He noted that it is good practice to use the rate of adoption of technologies as a proxy indicator for the success of interventions.

Reactions from participants:

- The challenge was raised how to align the proposed long-term strategies with the typical 3-5 year lifecycle of development projects? The suggestion was to come up with some form of intermediate benchmarks (markers) to indicate that a long-term intervention was progressing towards the desired outcome(s).
- The idea of dividing interventions between net-deficit producers and net-surplus producers was thought to be conceptually sound, but not easy to implement as both groups typically co-exist in the areas targeted by interventions.
- Matching grants were tabled as a viable option for encouraging ownership of PHL reduction interventions
- Most past interventions have been single-point because of high risks and this needs to change to address PHL issues throughout the value chain. Enhancing the efficiency of the entire post-harvest value chain increases profits for all actors in the chain and encourages actions to reduce post-harvest losses.
- The role of subsidies was raised, asking where money for subsidies should come from and how their effects on the markets should be analyzed?

3.5 Warehouse Receipting, Loss Reduction, and the Development of Value Chains for Grains

By Mr Jonathan Coulter, FAO Consultant

The presentation was a synthesis of a paper prepared in advance of the workshop to (i) identify typologies of warehousing, (ii) their implications for reducing post-harvest losses, (iii) their prospective impact on value chains (iv) the role of public policy and private investment, and (v) opportunities for support by governments and international agencies.

Warehousing is a collective term for warehouse receipt mechanisms and related inventory credit (WRS) which introduces liquidity into grain supply chains and can support PHL reduction. Warehousing creates a framework of accountability between the different parties involved (depositor, warehouse operator and financier) and for this reason is usually effective in reducing PHLs, in as much as these are significant prior to the introduction of the warehousing system. WRS relies on and encourages the adoption of improved practices and the use of improved storage facilities and insists on the adoption of grades and standards for stored grains. Three main warehousing approaches were discussed: private, public, and farmer-focused approaches.

Private warehousing has individual clients but no obligation to receive deposits from the public in general. It usually operates under tripartite agreements consisting of a bank, the borrower and a collateral manager such as a local subsidiary of an international inspection company. Largely focused but not exclusively on exported and imported commodities such as coffee, cocoa, cashew nuts, cotton, and rice, private warehousing is common in South Africa where financial markets are well developed. It provides local enterprises with crucial access to credit, helping them compete against vertically-organised multinationals. The main limitation of private warehousing vis-à-vis grain supply chains in Africa is that it has little involvement with farmers and small traders because of the large fixed cost that is required. Moreover, collateral managers have suffered in the wake of the global financial crisis

which has made it difficult for their insurers to obtain the relevant re-insurance cover thus causing various European providers to exit the business. Strengthening collateral management should be a top priority, including measures like the development of internationally-endorsed model contracts and systems of rapid dispute settlement.

Public warehousing where operating companies receive commodities from whosoever wishes to deposit (notably farmers), can be highly effective in enhancing grain value chains. For example, public warehousing through silo certificates was crucial to the successful liberalization of grain and oilseed marketing in South Africa. Various other countries have started implementing, but progress is slower due to the relative scarcity of larger scale players and informality of commodity chains, lack of bank involvement with grain value chains and above all, a difficult policy environment with politically-sensitive food crops. The most immediate opportunity seems to lie in Eastern Africa (particularly Kenya) where trading structures are closer to those in South Africa and where there are prospects for effective regulatory arrangements. The World Food Programme (WFP) through its "Purchase for Progress" initiative is already procuring some of its grain requirements through public warehouses and, as one of the region's leading grain buyers, can play a pivotal role in establishing the system.

In the case of farmer-focused approaches, small groups of producers or producer organizations store exclusively for their members. Basically there are two main variants. The first is the microfinance linked approach where stocks are held in the name of each individual farmer and finance is provided by a microfinance institution, often with bank re-financing. Such schemes are characterised by high levels of repayment and are already having a positive impact on commodity chains and local food security but, with the exception of the MFI-linked operation in Madagascar, the scale of impact is so far limited. In Madagascar paddy rice, the approach has had significant impact on agricultural lending and national price stability. The second variant is the cooperative approach where there is collective storage and marketing of grain, financed by a bank. Farmer focused approaches are also in use in Mali, Tanzania, Niger and Togo.

The presentation concluded with offering specific recommendations for the three approaches. Nonetheless, further testing and review are required to thoroughly validate and refine the approaches, and they should be appraised against the alternative of improving individual home storage in rural areas.

While the benefits of warehousing in its different manifestations are largely self-evident, it is much more of a challenge to establish it on a self-sustaining and growing basis. An examination of past successes shows that the approach adopted by international agencies (donors, UN, IFIs and private foundations) has been of crucial importance in the introduction of post-harvest innovations in general, and suggests that it is worth their investing resources to optimise their approaches and increase the success rate. Areas to prioritise are:

i. adoption of value-chain approaches;
ii. provision of thematic support over the long term, mirroring the time required to develop innovations, test and reformulate, and bring them to fruition (*social marketing approach*);

iii. learning from experience and having operational flexibility within projects;
iv. a strong focus on sustainability and pragmatism in the application of poverty and social criteria, and;
v. mutual learning and coordination of efforts among donors and technical agencies.

It was recommended that concerned agencies establish a network with a secretariat and associated experts, in order to share information, find out what works and why, systematically test and evaluate innovations, and support up-scaling of the most promising. It should do this in a way that adds to rather than duplicates what individual agencies are already doing. Above all the network needs to be 'hard-wired' to these agencies' decision-making levels, so that they can act quickly and decisively on issues brought to light.

Reactions from participants:

- The presentation was well received and found to be very interesting. Institutional and policy issues to support WRS need to be addressed.
- The question was raised on how to seek greater engagement of banks in supporting WRS.
- The importance of having a longer time frame for introducing WRS was stressed as was the existence of an enabling policy environment.

3.6 New Applications of Hermetic Storage for Grain Storage and Transport

By Mr Philippe Villers, GrainPro Inc.

Mr Villers mentioned that GrainPro Inc believes it can play a lead role in what it terms the "Phase II of the Green Revolution" with its airtight (hermetic) storage technology. Hermetic storage is a "green" and affordable technology that provides safe storage both before planting (seeds) and after harvest (grains). The technology has many advantages: the storage containers/cocoons are easily portable and movable (as compared to fixed warehouses); environmentally friendly due to none use of chemicals and toxic fumigants; and can be tailored to suit procurement needs and size of stocks. For instance it has been used by subsistence farmers in Ghana, Rwanda and Malawi; used as collection and storage centres by cooperatives and small traders and can serve as strategic reserves at a national level. Typically, the cost of the technology can range from USD 0.001 to USD 0.02 per kilogram making it affordable. Hermetic storage is currently in use in 38 countries and is increasingly popular for rice storage in Asia. GrainPro hermetic storage is used by organizations such as IRRI, CIMMYT, WFP, World Vision, Care, CRS, TechnoServe in addition to governments. The presentation then gave illustrations of the different sizes of bags and cocoons and their application. The SuperGrainbags could be applicable on a wide scale in the African context. Lately, hermetic storage technology has been used to line containers and trucks for international and intercontinental transfers. GrainPro is looking to partner with development finance institutions and practitioners to bring the technology to scale hence enhancing food security for Africa by mitigating PHLs through hermetic storage.

Reactions from participants:

- The technology has some disadvantages:
  - Does not work well in cold climates as insects tend to hibernate
  - The bag is not biodegradable as would be desired by some environmentalists but that would defeat the whole purpose of storage.
  - It is not an in-and-out-system, so can only be applicable as a plan for longer-term storage
  - As aflatoxin production occurs due to pre-harvest drought stress and post-harvest activities before storage, hermetic storage cannot by itself prevent contamination with aflatoxins. .
- Hermetic storage is more resistant to damage from rodents but still susceptible to other issues arising from its exposure, including mishandling by unqualified personnel. Of primary concern was the issue of security of stocks in cocoons. In this regard, cocoons need to be fenced in and guarded.
- The economics of the technology need to be better explored in particular the benefits to smallholders.

3.7 Programme Framework on Post-harvest Loss Reduction in Africa: Scope and Key Elements of the AfDB Framework Paper

By Mr Ulrich Boysen, AfDB

Currently the African Development Bank (AfDB) has 201 active agricultural operations budgeted at USD 2.3 billion. Approvals in 2009 were USD $350 million. PHL reduction is one of the medium to long-term actions identified in AfDB's Africa Food Crisis Response (AFCR) and is highlighted in the new agricultural strategy for 2010-2014 with three major work programmes, water, PHL, and capacity building for agricultural ministries. The Bank's Agriculture and Agro-Industry Department (OSAN) has since 2009 been developing a Post-harvest Losses Programme (PHLP). The overall goal of PHLP is to enable Regional Member Countries to achieve supply chain efficiencies through targeted investment in rural infrastructure, post-harvest and agro-processing technologies, thus contributing to a reduction of physical losses, improved food availability and enhanced product quality in a sustainable manner. The programme contributes directly to the implementation of Pillar II (Improving Rural Infrastructure and Trade related Capacities) within the Comprehensive African Agriculture Development Programme (CAADP)

An Action Plan for Programme implementation will be prepared in the first half of 2010. The Action Plan will focus on: i) Lending Programme preparation (identification, consultations with partners, studies, workshops, etc.) including an indicative pipeline of projects; ii) Development of Operational Guidelines which will further specify criteria for the selection and implementation of PHL related interventions. This can take the form of pure standalone operations as well as components of projects with additional investment targets. The Programme will also be implemented through mainstreaming of PHL interventions in on-going Bank operations.
The Bank has identified 44 projects in this regard from a screening exercise jointly undertaken with FAO.

To this end, the Bank has committed USD 1 692 million for the implementation of the programme over a period of five years (2010-2014). A key objective of the programme is to develop an inventory of successful PHL technologies and build in-house capacity.

Reactions from participants:

- Experiences were solicited of the Bank in undertaking Cost-Benefit Analysis of PHL interventions. They responded that no such analysis has been undertaken by the Bank due to unavailability of data required for such analyses. This was seen to be a common problem with many projects as it was sometimes deemed necessary to move forward without baseline metrics to avoid derailing efforts to address critical issues.
- There was a question on how the private sector could access financial resources from the Bank. The response was that this was possible through the Private Sector Window of the Bank or by the private sector player being a part of a project presented by a Regional Member Country (RMC) for funding through the Bank's Public Sector Window. However, the minimum loan size was $10 million and this was considered problematic except for the largest companies. The World Bank informed the group that it has recently established a Trade Facilitation Facility of approximately $42 million where funding is made available for supply chain and logistics improvement. Community development projects could access funds through the Bank's matching grants programmes.

4. LOOKING FORWARD: WHAT WORKS & WHAT DOESN'T

Mr David Nabarro, Special Representative of the UN Secretary General for Food Security and Nutrition and Coordinator for the High Level Task Force briefly attended the meeting at the start of the 2nd day. He was briefed on the objectives of the meeting and some of the on-going activities by the various organizations present. Thereafter, he gave some brief remarks on the topic. The role of the Task Force is to maintain political attention around the issue of reducing food insecurity and hunger. He said that the magnitude of PHL on food availability was recognized by the Task Force but was not well understood. He considered that with post-harvest food losses of 30 percent in many countries, PHL reduction should be considered as a priority for inclusion in the Comprehensive Framework for Action (CFA). He encouraged the workshop organizers to submit a narrative for inclusion in the updated Comprehensive Framework for Action soon to be published. His advice was that the narrative should indicate the proportion of production that is lost, explain factors related to PHL that were in and out of the control of farmers, and why some households suffer more PHL than others and what can be done to reduce losses.

4.1 Synthesis of Day One

By Nancy Morgan; Sergiy Zorya and Luz Barania Diaz Rios, World Bank

Deliberations on day one included:

- Innovative information systems that can build capacity to measure in-country PHLs
- Institutional arrangements which can be supported to improve efficiencies of value chains e.g. warehousing receipt systems
- Technologies which exist and can be introduced to reduce PHL, taking account of socio-economic and cultural factors and particularly reviewing what hasn't worked in the past
- Activities being undertaken by various institutions

PHLs may fall into any or all three categories namely physical losses, reduced market opportunities and nutritional and food safety issues. The presentations from the previous day showed that PHL in the major cereals produced in Africa are significant, typically 10-25 % of volume produced PHLs in cereals occur along the supply chain from field to table, but the extent of losses varies greatly from one crop to another and from one context to another.

There was consensus that assessment of the nature and extent of PHL requires careful consideration of many different factors, including varieties used, crop physiology, production system, growing conditions, weather, availability of suitable storage facilities, distance or time to market, handling and distribution practices, and patterns of consumption and use. Concerning cereals in sub-Saharan Africa, the consensus opinion of experts and knowledgeable observers is that the technical areas of grain protection, individual farm storage, grain drying and market information should be prioritized in considering interventions.

There was a general agreement that the focus of interventions should be along the value chain and that it is critical to develop/strengthen producer groups. It was also noted that isolated investments do not work. Gender and diversity sensitive approaches should be used in all planning, selection, implementation, communication, and up-scaling of PHL reduction interventions. There appeared to be a general perception that differential approaches are needed depending on whether the aim is household food security or commercialization of agriculture; however, there was no clear consensus on the role of subsidies in the process. Furthermore, it was desirable that measuring success be a strong component of future PHL reduction interventions.

4.2 Private Sector Perspectives

This session was a panel discussion involving representatives from the private sector (grain industry) in Africa. Following is a summary of their affiliation and their experiences related to PHLs.

Harriet Nabirye is the Uganda Country Manager for the ***Eastern Africa Grains Council (EAGC)***. Previously, she was with the Uganda Grain Traders Association (UGTA). The UGTA, consisting of 16 grain traders, had worked well and supplied large quantities of good quality grain to countries such as Zambia (30 000 tons) and to the World Food Programme. The EAGC draws membership across the value chain:

producers, traders and processors. Service providers are associate members. It operates as a non-profit, non-political, non-denominational organization, which prepares, disseminates, and promotes the exchange of information on matters affecting the regional grain industry. Among its activities, it supports regional trade and provides training in post-harvest handling. However, lack of funds precludes follow-up to promote adoption of technologies or use of knowledge acquired. The Council is interested to broaden its membership across Africa, and thinks it has the capacity to promote the use of the warehouse receipt system, but the current certification process constitutes a barrier to its involvement. Warehousing seems to be jeopardized by issues of trust between the banks and the various stakeholders. Banks seem interested to work with the EAGC. Moreover, the Council can encourage farmers to bulk their grain thereby affording farmers opportunities to do collective marketing to access better markets. The Council in Uganda is also considering how it could advocate a ban on exportation of poor quality grain to improve quality. One of the initiatives of the EAGC is the Regional Agricultural Trade Intelligence Network (RATIN) which was developed to help reduce regional food insecurity through market information and sensitizing farmers to access better markets. The idea is to have farmers readily access market information through their mobile phones but that has been constrained by logistical issues. The Council sees poor infrastructure and particularly lack of proper storage facilities as some of the constraints facing PHLs reduction. Ms Nabirye mentioned that lack of contracts is a key impediment militating against quality enhancement. Farmers are price-takers and therefore have no incentives to reduce PHL.

David Nyameino is the Chief Executive Officer for the ***Cereal Growers Association (CGA))*** in Kenya. CGA is a membership-based organization whose membership consists of small holder farmers, who join through farmer groups; middle-scale farmers; large-scale farmers and other institutions affiliated to the agricultural sector. CGA has been in operation for the last 7 years and provides a number of services to farmers who lost the support of government following market liberalization. Now CGA provides extension services through associate members such as input suppliers and financial institutions. Its current membership stands at 16 000 members, but estimates it reaches up to 300 000 farmers through fairs and radio. The Association has implemented projects with ACDI/VOCA (to help farmers increase yields and link them to markets) and with AGRA (3 year market programme to train farmers to store and bulk grains). CGA has trained its members on post-harvest handling and storage (through agronomists, training consultants) and has also introduced innovative technologies to its members via demonstration plots. A key observation by the association, particularly with smallholder farmers, is that farmers learn from successful examples. Currently CGA is working with WFP and the USAID East Africa's Competitiveness and Trade Expansion Program (COMPETE) programme. There is a proposal to set up village storage satellites, each equipped with facilities for grain receiving (scale, moisture meter and bag stitcher). What is workable? There is a need to create awareness on the degree to losses and the importance of timeliness in harvesting. CGA would appreciate assistance and technical support in capacity building because membership funds do not cover many costs. Investment in the satellite store systems and the marketing system around them would also create incentives for farmers to improve quality and reduce PHL.

Tom Gambrah, the Managing Director of ***Premium Foods Limited***, presented a model of an integrated approach to grain handling that his company was piloting. The model is a result of reflection on his part, following the bankruptcy of his maize buying and selling company. The main reason for failure of the company was the lack of value addition to the maize and macroeconomic conditions (inflation rate) at the time. The new company—Premium Foods Limited— is a milling business and thus adds value to the grain. The model consists of an agribusiness centre that hosts a dryer, sheller and storage facilities; farmer organizations; banks for providing financial resources and other stakeholders such as BDS providers and input suppliers. The model uses mechanisms such as the warehouse receipt system for inducing liquidity into the system. The farmers pay for extension services. Mr. Gambrah hoped that donors would select and support an area which is of interest to them, such as an agribusiness centre. Currently USAID is involved in the pilot project and is providing capacity building for farmers (training and extension). Mr Gambrah feels that the model is efficient and can be replicated. The way the model works is that farmers deliver their harvest to the agribusiness centre before it is dried. The centre processes and sells the grain and will pay off loans provided to the farmer by the input supplier. The centre serves as the "change driver" as it becomes the core of a sustainable system through which provision of technical assistance, training and finance to farmers can be facilitated. Drying by the centre has reduced the time required by farmers to dry their grain to only 3 days, which results in better quality and less PHL. Mr Gambrah appealed to the development community to partner with the private sector in project implementation. One area of support that he noted is the establishment and use of product standards.

Paulo Chiziwa from the ***Malawi Grain Traders and Processors Association (GTPA)*** and an agronomist by profession shared his experiences in Malawi. GTPA is an association of grain traders and large-scale farmers and is involved in the trade of cereals, particularly maize. In 2007, the association members were able to export a significant amount of maize to Zimbabwe. Malawi experiences a lot of problems with PHLs. Although the country has some storage facilities, they are not easily accessible to farmers. Variable government policies make planning of activities by the association difficult. The association does train its members on post-harvest handling through a grant from AGRA but has no means of monitoring how that knowledge trickles to the farmers from whom traders source the grain. One notable outcome of efforts of the association is the setting up and participation in the Grain Marketing Advisory Council which has a direct input to agricultural policy in the country. He was interested to know how his group could participate in the WFP/P4P. Mr Chiziwa mentioned that assistance is needed to facilitate access of trading companies to storage facilities owned by ADMARC, and that one way this could be done is the establishment of satellite points for receiving grains from farmers and provide storage facilities and a means for quality control upon grain intake.

Anthony Mwanaumo, the Executive Director of the ***Food Reserve Agency (FRA)*** in Zambia shared his experiences in procuring from smallholder farmers for Strategic Food Reserves of the country. FRA procures grain in the less accessible areas of the country (often shunned by the private sector due to high transaction costs) through farmer associations. It has therefore had a significant impact on incomes of smallholder farmers. It considers itself to be the largest single player in the maize market. The greatest challenge faced by FRA is that maize yields are very low,

limiting its ability to scale–up and supply promising export markets such as Zimbabwe, Democratic Republic of the Congo and Namibia. FRA is very strict at the buying stage and has invested heavily in training farmers on the on-farm preparation of maize. Extension officers issue a certificate of quality adherence (CQQ) which is an incentive for farmers to produce high quality maize. Additionally, FRA manages public storage facilities and is a significant contributor to PHL at the storage level. He identified the following good practices of FRA which are related to reduced levels of PHL: strict quality control applied during grain reception at buying areas; sensitization of farmers (through posters, etc) on good handling practices; applying rewards for good and penalties for bad quality. In terms of the way forward, there are concerns on the applicability of PHL interventions such as warehouse receipts system and commodity exchanges. The warehouse receipt system in Zambia had previously failed and the critical issue in making it work is appropriate sequencing to establish the legal framework, infrastructure and other elements required in its successful operation. Pilot projects could be launched to facilitate learning. Another challenge is how to use warehouse receipt in remote areas.

Discussion by participants:

- The private sector has a potential to influence government interventions. A few examples were shared of cases in which the private sector motivated the public sector to create an enabling environment for private sector investment/interventions.
- It was stated that FAO is currently working, in collaboration with the Malawi Ministry of Agriculture, on a training manual for improving traders' grain handling and management practices.
- A major constraint to improving quality in Uganda was the multitude of small traders from Uganda, Southern Sudan and Kenya who were prepared to buy from small farmers with no quality control. Even though UGTA had imposed strict buying standards, this had little long term impact after UGTA's closure.
- Mr. Gambrah also informed the meeting that he was the President of the newly formed Ghana Grains Council, which was presently receiving funding from USAID. This was an association of all chain stakeholders, either represented individually or through their own associations. In regard to PHL, he was of the opinion that these were not significant at the wholesaling or milling stage but the major problems were at the farm level.
- Mr. Mwanaumo (FRA, Zambia) considered storage losses in large scale enterprises to be insignificant, quoting a figure of 0.7 percent for the most recent crop year. However, it was contended that the low storage losses in large scale enterprises adopting strict procurement standards has the effect of pushing the responsibility for post-harvest management down to the farmer level where losses are much higher.
- Both Messrs Chiziwa and Nyameino considered that farmer and trader training were essential if grain losses were to be reduced. Their organizations were carrying out such training but on a limited scale. The problem however remained: how to ensure that the marketing chain would reward quality improvements.
- One of the key conclusions from the session was that offering price incentives to farmers and chain actors yields positive benefits in terms of PHL reduction.
- A question raised in the discussion session was related to the fate of grain rejected by receiving stations. In this regard, the importance was mentioned of exploring

diversifications options through which such rejected products can be transformed into other marketable products.

4.3 International Experiences

This plenary session, chaired by Sergiy Zorya, focused on drawing out some of the lessons on better understanding the role of 1) the government, 2) the private sector (focusing on incentives to foster linkages with communities and farmers; and 3) donors. He took stock of the previous discussions, summarizing major messages as follows:

i) One needs to look at PHL in the context of logistical and trading efficiency of supply chains as well as perceived value generated by value chains. Rather than focusing on single point interventions, say at the farm or community level, the consensus is that analysts should carefully identify entry points for interventions at various stages, taking into account benefit-cost ratios.

ii) Many promising PHL-reducing technologies are available, both local and out-of-region, but their wide use is subject to the efficiency of value chains

iii) Improving the enabling environment and providing basic public goods such as electricity and roads not only makes technologies affordable but also shifts on-farm activities for PHL reduction up to other players of value chains. Improved access to markets, for example, would accelerate trade and thus reduce the need to store grains on farm and lower physical losses automatically, while encouraging cereals' drying which would benefit from output price premiums.

iv) A predictable price policy would support investments in off-farm storage, which could provide drying and storage services to smallholders at affordable fees, and encourage the underutilized power of the private sector to provide many PHL solutions. Overall, basic critical measures include predictable policy and price environment, better roads and lower transport prices, better access to electricity to allow local drying and processing and improved access to rural finance and better integration of smallholders in formal value chains, among others.

However, the above measures are not always sufficient. Governments and donors can facilitate an increase in adoption of PHL-reducing technologies through (i) increasing the importance of PHL in the agendas of agricultural research and extension services; (ii) supporting demonstration of technologies through lead farmers, farmer field schools, and other venues; and (iii) supporting producer groups with matching grants to procure technologies, etc. In some food deficit areas, village grain banks can be utilized to address PHL and smooth seasonal consumption in the village. Yet, as experience form the Sahel and other parts of the world illustrate, once these areas improve and begin using these grain banks to participate in markets, other arrangements would need to be put in place. Village grain banks are rarely able to compete with traders, and thus should not be used for the purpose of farm commercialization.

The chair then opened the floor for discussions.

Mr Seidler stated that for food security objectives, one could focus on on-farm interventions, but for commercial systems, PHLs should always be considered in the context of the entire chain.

Mr Nyameino mentioned that we do need on-farm interventions but these should be appropriate for the scale of the farmer.

The question was also raised as to whether the public sector should focus its attention on providing public goods, which if available would automatically lead the private sector to reduce PHL to enhance profits. Mr Nyameino felt that actions were required at both levels, but what was even more important was coordination by development agencies to avoid duplication and ensure that all aspects (infrastructure, education, etc) are addressed. Mr Coulter highlighted the importance of establishing a process among these supporting agencies in order to ensure that all aspects are addressed.

Mr Lamb felt it was important to raise the public sector's awareness regarding the fact that food security could be ensured more cost-effectively, and with less adverse environmental effects, through reducing PHL rather than increasing production. He also mentioned that a possible area to explore in the effort to reduce losses is to involve the logistics companies such as CARGILL. In this regard, Mr Shepherd noted that after trade liberalization it was felt that these companies would increase their involvement in Africa; however the complex business environment has made this difficult.

Doyle Baker mentioned that it is important to try to understand what "minimally acceptable losses" mean and realize that in some cases it may be more costly to reduce existing losses that not.

Mr Hodges mentioned that the technologies for PHL reduction exist, but the issue lies in their adoption. Regarding technologies, Mr Jenane mentioned that the issue of technologies should be looked at through a broad lens, in order to take into consideration the support services required (such as fabrication, repair and maintenance; financing, etc).

Mr Boysen felt that public-private cooperation was a key aspect. He wondered why private sector participation was still weak, despite the market opportunities created by drivers such as urbanisation and buyers such as WFP P4P. He felt that the issue of using a value chain approach was important but it was equally important to foster a distribution of labour along the chain. Mr Miller mentioned that a key way to foster private initiatives is through "missing middle" financing to encourage the participation of key stakeholders in the value chain such as truckers.

Mr Schonberger noted that it is important while designing interventions not to apply specific institutional models, as these should be allowed to evolve out of the local needs in the specific context. He felt that one of the key roles to be played by the public sector is to assist the private sector to manage risk.

The experiences of post-harvest development in Africa and elsewhere point to the following determinants of success:

- Strong commitment and support of the governments and donor community; however, the private sector should play a major role in working with government to identify key investments for reducing post-harvest losses.
- Existence of a strong domestic demand for grains and products derived from local grains rather than imports
- Presence of strong and inter-disciplinary approaches and institutions which facilitate and drive participatory development and testing of new technologies to help move the knowledge into use. For example, the adoption of hammer mills followed the process of electrification in rural areas.
- IFIs need to play a role in chain enhancement and any focus on technology adoption needs to be accompanied by support services. The proposed Africa Agribusiness and Agro-industries Development Initiative (3ADI), which was endorsed on March 10, 2010 during the High-Level Conference on the Development of Agribusiness and Agro-industries in Africa (HLCD-3A), comprises financing mechanisms to support agricultural development with access to post-harvest financing. Details can be found at www.hlcd-3a.org.
- Gender and diversity-sensitive approaches should be used in planning, selection, implementation and up-scaling of post-harvest loss reduction interventions; and differential approaches are needed depending on whether the principle objective is household food security or commercialization of agriculture.

4.4 Strategy on Developing a Community of Practice on PHL- The way forward

After deliberations, consensus emerged on the need to develop a community of practice to share views, exchange experience and lessons learned on PHL strategies, technologies and approaches. Participants concluded that concerned agencies should establish a network with a secretariat and associated experts, in order to share information, find out what works and why (in depth), systematically test and evaluate innovations, monitor rates of adoption of technologies and support up-scaling of the most promising interventions. It should do this in a way that adds to rather than duplicates what individual agencies are already doing. Above all the network needs to be hard-wired to these agencies' decision-making levels, so that they can act quickly and decisively on issues brought to light.

With the transition to market-driven systems and greater reliance on the private sector, interventions to reduce PHL must be considered within the context of commodity value chains and focus on systemic interventions that improve the efficiency of the chain as a whole, rather than the disjointed, single-point interventions of the past. The central role of the private sector must be recognised, and post-harvest loss reduction strategies developed that provide economic incentives to all actors in the chain. This needs to be underpinned with an enabling environment that encourages private sector investment and the partnering of the public and private sectors in spearheading growth and development

While the priority focus of the workshop was on grains, if the product scope could be expanded then participants felt that the addition of cassava should be accorded priority because of its extensive consumption in many parts of Africa. The issue of how to ensure capacity building at the local level was raised and the need to coordinate donor's focus to ensure collaboration was highlighted. APHLIS was considered as a possible entry point and this could be linked to FAO's INPhO.

When impact assessments of interventions are undertaken, it was suggested that practitioners use adoption as an indicator of success or failure, paying attention to reasons for acceptance or rejection. Participants also indicated that the technologies are already well known and there is no need to re-invent new ones. The immediate approach to follow should be on "Doing better with what we already have" rather than seeking new technologies and on developing skills to build on successful past interventions.

4.5 Conclusions

Post-harvest losses are economically significant in developing countries for a broad range of commodities, resulting in a substantial negative impact on food security and on livelihoods. In comparison to interventions to increase production PHL reduction interventions can be considered the 'low hanging fruit' or the fast track to enhancing food availability and food security. Achieving a substantial reduction in PHL (especially for grains, pulses, and certain tubers) would contribute significantly to achieving the MDGs on hunger and poverty.

Despite the importance of PHLs, there is currently no recognized coordinating mechanism at the international level for tackling PHL. Hence the proposal was made to establish a community of practice for post-harvest approaches through the formation of a Secretariat that would seek to raise the profile of the sector. The post-harvest network would share information, provide systematic evaluation of innovations and assist in scaling-up interventions. The meeting agreed on the need to develop a community of practice to facilitate the evaluation of innovations and assist in their scaling-up, knowledge management and information sharing on best practices and lessons learned. Such a platform would allow expert knowledge (for example, residing in agencies such as FAO) to be channelled into the development agenda, be shared with countries, and inform investment programmes. It was agreed that FAO's AGS Division and the World Bank's ARD Department would explore financial and operational modalities for a secretariat to serve the community of practice. Potential future partners to be involved include AfDB, GTZ (Gesellschaft für Technische Zusammenarbeit), IFAD, WFP, USAID, UNIDO, IFC (International Finance Corporation), CIRAD (Centre de coopération internationale en recherche agronomique pour le développement), NRI, AGRA (Alliance for a Green Revolution in Africa), regional bodies in Africa, as well as public and private-sector stakeholders in the Continent. Future forums in the Region are encouraged to include both the public sector and the private sector. The incorporation of an institution such as ASARECA was mentioned so as to ensure leadership from the Region and to link with CAADP.

The value chain approach was considered a necessary tool for assessing PHLs, as at one point along the supply chain PHLs may appear small, yet the cumulative figure across the value chain could be quite significant.

There was consensus among all participants that the way forward includes knowledge management (definition of best practices and lessons learned), adaptive research (need to allocate resources) and the incorporation of social marketing approaches. The World Bank indicated that avenues for identifying supportive funding for the network secretariat through WB Trust Funds would be explored if its structure is defined and supported by other development agencies**.**

Annex I

Workshop Programme

Time	Activity	
Thurs 18 March	**Current Status and Initiatives**	Moderator: John Lamb
09:00-09:10	Opening address and welcome	M. Traore ADG/ AG - FAO G. Mrema, Director.AGS
09:10- 09:15	Welcome remarks	John Lamb (WB)
09:15-09:30	Meeting overview and expectations for the workshop, introductions	John Lamb (WB)
09:30-10:00	The APHLIS information platform: a source of data on physical PHLs	F. Rembold (EU)
10:00-10:20	**Coffee break**	
10:20 -11:00	Review of on-going activities in PHLs (FAO, WB, AfDB, EU, etc) – current focus	Panel Discussion, moderated by Sergiy Zorya
11:00:11:45	TCI/AGS summary of country case studies on post-harvest losses and identified priorities	Julia Seevinck TCI/Njie (AGS)
11:45-12:30	WFP P4P lessons; implications for PHL reduction and enhanced services to producers – constraints and successes	Ken Davies/B. Salvignol (WFP)
12:30-12:45	Discussion of key elements of morning presentations	Sergiy Zorya (WB)
12:45-14 :00	**Lunch**	Moderator: C. Jenane
14.00-15.00	Presentation and review of NRI PHL review paper	R. Hodges (NRI/WB)
15:00- 16.00	PHL reduction- modalities along the chain- review of storage options and warehousing incl. warehouse receipts and possible roles of public and private sector	J. Coulter (consultant)
16.00 -16.15	**Coffee Break**	
16:15- 16:45	"New Applications of Hermetic Storage for Grain Storage and Transport" – storage technologies and their appropriateness for reducing post-harvest losses	P. Villers (GrainPro)
Friday 19 March	Looking Forward: What works and what doesn't	Moderator: Boysen
09.00-09.20	Morning Check-In - Reviewing the Lessons	Nancy Morgan, Luz Barania Diaz Rios (WB)
9.20- 10.10	Programme framework on Postharvest Loss Reduction in Africa Scope and Key elements of the AfDB framework paper	Boysen (AfDB)
10.00- 10.20	**Coffee break**	
10.20- 11.15	Private sector perspectives – review of needs to address PHL,- roles of the private sector and support required; perceived roles of governments and development agencies	Panel discussion involving stakeholders from the private sector in Africa
11.15.-12.00	International experiences in PHL interventions – constraints/ enabling environment/ adequacy of interventions/ institutional issues	Plenary discussion on experience of PHL interventions – from farm to market incl warehouse receipt systems involving small producers
12:00-13:00	Moving the Agenda forward: Strategy on developing a community of practice on PHL, ensuring long term action and continuity.	John Lamb/ Njie/ Jenane/ Boysen
	Lunch and end of workshop	

Annex II

List of Participants

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Annex III

Technical Meeting on

Lessons Learned and Practical Guidelines on Achieving Postharvest Improvements in Grain Supply Chains in Africa

18 – 19 March 2010
Lebanon Room –D209, FAO Headquarters

Introductory Remarks

by

Mr Modibo Traoré

Assistant Director-General

Agriculture and Consumer Protection Department

Food and Agriculture Organization of the United Nations (FAO)

Dear Participants;

On behalf of the Food and Agriculture Organization of United Nations, I welcome you all to this technical meeting. We are very pleased that you are able to participate in this meeting which seeks to address the important issue of how best to achieve a reduction in post-harvest losses in Africa.

The reduction of post-harvest losses is of great importance in the quest to promote food security, alleviate poverty, create income generation opportunities and foster the economic growth of African countries. It is especially critical for the grain cereals, pulses and oilseeds which will be the focus of your deliberations at this meeting, as these sectors constitute the predominant staples in many communities in Africa.

For cereals alone, FAO estimates show that at least 14 million tonnes of quantitative losses are encountered annually in the Continent, with a monetary value of more than US$ 4 billion. When loss in nutritional value and market opportunities are factored, as well as possible adverse effects on the health of populations consuming poor quality products, the need for interventions to reduce post-harvest losses becomes obviously clear. We were all reminded of the necessity for action by the soaring food prices crisis and the global economic recession of 2007-2009.

As you may know, FAO's systematic involvement in the reduction of food losses dates back to the late 1960's with the Freedom from Hunger Campaign. Following the first UN World Food Conference in Rome in 1974, FAO established the Action Programme for the Prevention of Food Losses (PFL) in 1978 which ran through to the early 1990s. The purpose of the Programme was to assist developing countries to identify post-harvest food losses and to implement programmes for the reduction of food losses at the national level through direct action projects.

Driven by rising per capita incomes, changing technology, trade liberalization and rapid urbanization, dramatic changes have taken place over the last two decades in global agri-food systems in general and in Africa in particular. This necessitates that we take a new look at the issue of post-harvest food losses and re-align our intervention strategies to focus on systemic improvements rather than the formerly disjointed, single interventions. A common characteristic in Africa is the transition to market-driven systems, with a greater reliance on the private sector. This raises the importance of appropriate enabling environments to encourage private sector investment and the partnering of the public and private sectors in spearheading growth and development.

Studies carried out by FAO reveal that of the US$940 billion that need to be invested to eradicate hunger in sub-Saharan Africa over the 44-year period to 2050, up to 47% will be required in the post-harvest sector. Investments are required for cold and dry storage, rural roads, rural and wholesale market facilities and for first stage

processing. Although the investment needs are substantial, we are optimistic they will be realised given the commitment on the Continent to invest in agriculture.

At the African Union's 13th Summit of Heads of State and Government the theme was *'Investing in Agriculture for Economic Growth and Food Security'*. Most countries are implementing agricultural strategic frameworks that are in line with CAADP which, through its Pillar 2, is directly related to a policy agenda and programme initiatives for improving infrastructure and gaining market access to local, regional, and extra-regional markets.

Just last week, we were in Abuja, Nigeria to participate in the High-level Conference on the Development of Agribusiness and Agro-industries (HLCD-3A). A key outcome of the HLCD-3A was a unanimous endorsement of the African Agribusiness and Agro-industries Development Initiative (3ADI) which incorporates a programme framework and associated financial modalities to foster the development of agribusiness and agro-industries.

As you know, the development of agribusiness and agro-industries is a key aspect of any programme targeting the reduction of post-harvest losses, improving food quality and safety, extending the shelf-life of food, and increasing efficiency along the food chain from production to consumption.

This technical meeting is therefore very timely and critical in considering available options for the achievement of improvements in the post-harvest parts of the food chains and in identifying best practices and institutional arrangements to reduce post-harvest losses.

We are pleased to note the presence here of our development partners, the World Bank, WFP, IFAD, UNIDO, AfDB and the European Commission, the Natural Resources Institute (NRI) of the UK, as well as private sector participants from the grain industry in Africa. We consider your presence here to be invaluable, as to be successful any interventions being proposed must be based on recognising the roles of all partners.

We at FAO assure you that we will continue to provide any required technical support for the formulation and implementation of programme frameworks targeting the reduction of post-harvest losses in Africa.

I wish you fruitful deliberations and look forward to receiving your recommendations.

I thank you all for being here.

Annex IV

Workshop Presentations

Cereals postharvest loss figures from *APHLIS* (African Postharvest Losses Information System)

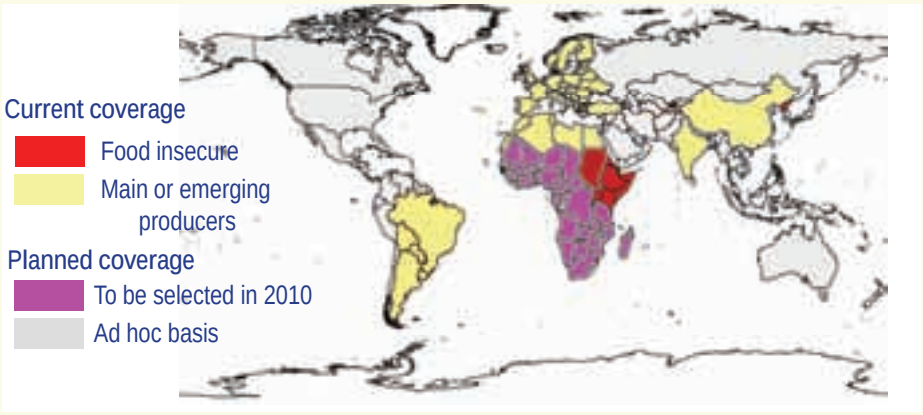
Contents

- Quick introduction to the MARS project
- Postharvest losses figures from *APHLIS:*
  - the origins
  - the network
  - the service
- Vision for the future

The MARS project

- **MARS = Monitoring Agricultural Resources,** started 20 years ago to monitor and control agriculture in Europe
- FOODSEC action since 2000:
  - core competences address mainly the food production component of FS through:
    - Crop monitoring with remote sensing
    - Agro-meteorological crop modeling
    - Statistical analysis and yield forecasts
  - since 2006:
    - technical support to FS informtion systems in Horn of Africa
    - new competences and research in demand and access to food components of FS
    - extension to food insecure areas world wide

Geographic Coverage of MARS bulletins



- Currently more than 40 crop status reports per year for food insecure countries
- Significant expansion in Sub Saharan Africa as consequence of food crisis
- More than 1 Tb per year of low and medium resolution satellite imagery

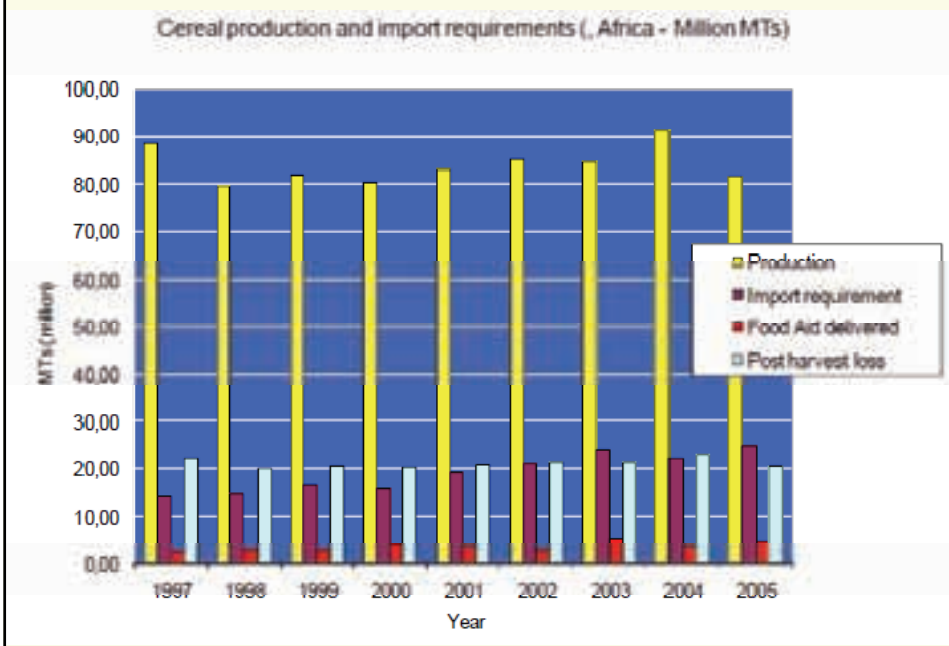
Technical support to Food Security Information systems in the Horn of Africa

Project funded by EuropeAid, approx. 1 Mio Euro/year for 2005 – 2013, main activities:

- Provide technical support to food security information systems in the Horn of Africa (2005 -2009) and Sub Saharan Africa (2010 – 2013),
- Improve FS assessment methodologies used by U.N. agencies, NGOs and national governments (e.g. In CFSAM missions)
- improve the estimation methods of food availability (in food balance sheets):
  - Post Harvest Losses (for Sub-Saharan Africa)
  - Cereals availability (study case: Ethiopia)

PHL estimates, the problem

- Before *APHLIS*, very general reference values were used, which in many cases date back to the 70´s and are covering only a limited number of countries,
- Cereal losses vary over a very large range, but are generally approximated by values between 1 and 20 per cent,
- Conceptual errors: losses mixed with other information, cumulated values not very accurate etc…
- During need assessments it is normally not possible to perform any post harvest loss surveys or measurements,
- Wrong estimates affect directly the final deficit figure (error margin often larger than total food deficit),
- 2007/2008 food crisis: new focus on sources of food insecurity



Source: WFP 2008

APHLIS - a unique service

APHLIS generates estimates of postharvest losses (PHLs) of cereals in East and Southern Africa and is

- Based on a network of local experts who submit data and verify loss estimates
- Built on a complete survey of the literature on PHLs

APHLIS provides ……

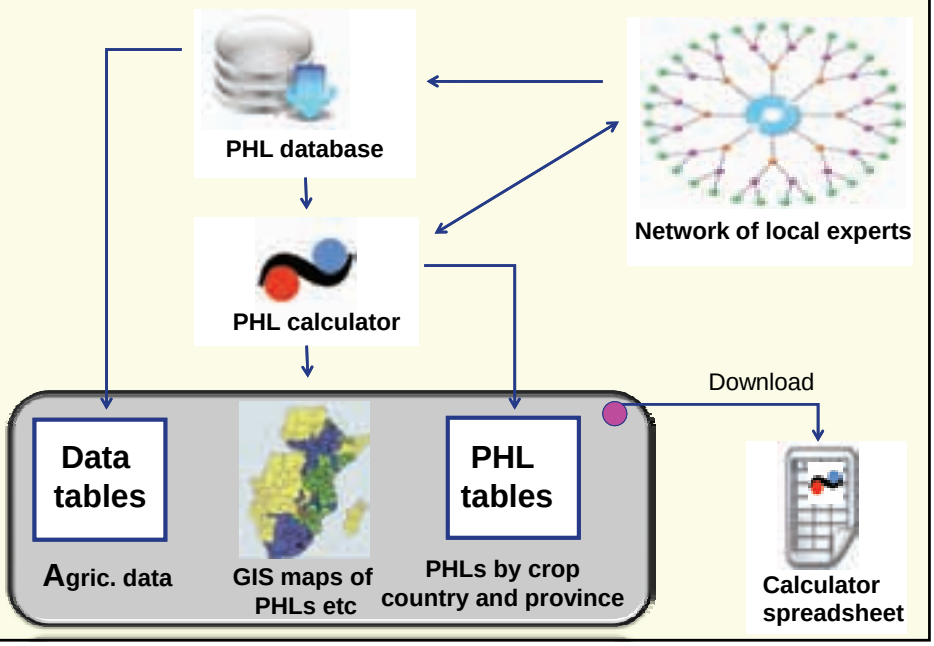
- Loss estimates by cereal, by country and by province that are updated annually
- A display of the data used to derive losses so the system is fully transparent, and
- The opportunity to add better loss data so that loss estimation can improve over time

A system for getting better PhL estimates

The main elements of *APHLIS* are –

- Local expert network providing data and verifying PHLs
- Database with access to local experts, by country
- PHL Calculator (model) that estimates losses
- Web site for display of loss data by cereal for each country and each province, in tables and in maps
- Downloadable calculator for PHL estimation at any geographical scale

APHLIS – the System in a nutshell



APHLIS network of experts – its most important resources

How the PHL calculator works

The PHL calculator determines a cumulative weight loss from production using loss figures for each link in the postharvest chain. A set of losses figures for the links of the postharvest chain is called a PHL profile

Example of a PHL profile for maize grain

Harvesting/field drying	6.4
Drying	4.0
Shelling/threshing	1.2
Winnowing	-
Transport to store	2.3
Storage	5.3
Transport to market	1.0
Market storage	4.0

Figures taken from the literature or contributed by network experts

PHL Calculator contd

PHL profiles are specific for

- Climate type (A – tropical, B - arid/desert, C – warm temperate)
- Crop type (different cereals)
- Scale of farming (subsistence/commercial)

Five examples of PHL profiles

Climate type **Crop type** **Scale of farming**	**A** **Maize** **Small**	**C** **Maize** **Large**	**B** **Sorghum** **Small**	**B** **Millet** **Small**	**A** **Rice** **Small**
Harvesting/field drying	6.4	2.0	4.9	3.5	4.3
Drying	4.0	3.5	-	-	-
Shelling/threshing	1.2	2.3	4.0	2.5	2.6
Winnowing	-	-	-	-	2.5
Transport to store	2.3	1.9	2.1	2.5	1.3
Storage	5.3	2.1	2.2	1.1	1.2
Transport to market	1.0	1.0	1.0	1.0	1.0
Market storage	4.0	4.0	4.0	4.0	4.0

PHL Calculator contd

The PHL profile values are modified according to –

1. Wet/damp weather at harvest
2. Length of storage period (0-3, 4-6, >6 months)
3. Larger grain borer infestation (for maize only)

… and the PHL calculation takes into account –

4. The number of harvests annually (1, 2 or 3)
5. Amount of crop marketed or retained in farm storage

NB PHL values are affected much more by the application of modifiers than by the initial selection of the PHL profile.

How to get a PHL estimate

Postharvest Losses Information System

- Home
- Losses estimates
- Losses maps (interactive)
- Literature
- Downloads
- PHL Network
- About us Contacts Links
- Production
- Yield
- Larger grain borer
- Average farm size

Two ways to get PHL estimates

Consult the tables and/or maps on the website for losses by region, country or province

that makes these estimates can also be downloaded by users as a spreadsheet and default values changed to user preferences. A Users' Guide to the system and a Review Paper on post harvest weight loss estimates for the region can also be downloaded. The data on which this system is based was submitted by local experts who together form the PHL Network. The left hand menu bar provides access to this database by country.

Current site: www.phlosses.net

Is being moved to new domain: www.aphlis.net

Loss tables

Regional losses for all cereals and by cereal type

Estimated Postharvest Losses (%) 2003 - 2009

Weighted average according to reported figures

Regional total PHL for cereals [% of total annual production]					
2003	2004	2005	2006	2007	2008
17	14.4	14.3	14.8	15.1	17.4

Regional PHL by cereal [% of total annual production]							
Cereal	2003	2004	2005	2006	2007	2008	2009
Maize	22	16.4	16.2	17.7	17.8	22.4	-
Barley	9.9	8	9.7	9.7	9.7	-	-
Wheat	13.3	9	13.6	11.5	11	-	-
Sorghum	12.4	12	12.1	12.3	12.2	12.5	-

Click

Loss tables by cereal type and country

Estimated Postharvest Losses (%) 2003 - 2009

Weighted average according to reported figures

Back

Maize							
Country	2003	2004	2005	2006	2007	2008	2009
Angola	-	-	-	-	-	-	-
Botswana	-	16.5	15.5	16.9	14.4	-	-
Burundi	-	-	-	-	-	-	-
DR Congo	-	-	-	-	-	-	-
Eritrea	20.7	20.5	20.7	20.7	17.9	-	-
Ethiopia	-	17.9	17.9	17.8	16.4	-	-
Kenya	-	-	-	-	21.1	-	-
Lesotho	-	17.2	17.2	17.2	17.2	-	-
Madagascar	-	17.4	17.4	-	-	-	-
Malawi	-	20.4	20.4	20.6	19.6	-	-
Mozambique	21.6	19	19.4	21.1	21	-	-

Click

Loss tables by cereal type and province

Estimated Postharvest Losses (%) 2003 - 2009

for Maize in : Malawi

Provinces of Malawi

Click on a loss figure *in the table below to see in detail how the figure was derived. Send us* ***your comments*** *if you have the feeling that the underlying data and assumptions could be improved.*

Please sent your comments to ***R.J.Hodges(at)gre.ac.uk****.*

Back

Province	2003	2004	2005	2006	2007	2008	2009
Area under National Administration	-	20.5	20.5	20.6	19.7	-	-
Central Region	-	20	20	20.1	19.3	-	-
Northern Region	-	20.8	20.9	21	20.6	-	-
Southern Region	-	20.5	20.5	20.6	19.8	-	-

Back

Click on one of these figures
to get details of the loss calculation

Calculation matrix documenting the PH loss calculation
quality of data sources and references to sources

Country: Malawi
Province: Area under National Administration
Climate: Humid subtropical (Cwa)
Year: 2007
Crop: Maize

Details of the loss calculation.
Production data by farm type and losses over seasons

Annual production and losses

	tonne	%
Production	3444655	100
Grain remaining	2767401	80.3
Lost grain	677254	19.7

Seasonal production and losses

Season	Farm type	Production (t)	Remaining (t)	Losses (t)	Production (%)	Remaining (%)	Losses (%)
1	small	2856698	2284102	572596	92.9	74.3	18.6
1	large	218237	191737	26500	7.1	6.2	0.9
Seasonal:		3074935	2475839	599096	100.0	80.5	19.5
2	small	369720	291563	78157	100.0	78.9	21.1
2	large	0	0	0	0.0	0.0	0.0
Seasonal:		369720	291563	78157	100.0	78.9	21.1
Annual:		3444655	2767401	677254	100.0	80.3	19.7

NB Annual averages are a weighted average of the seasons

Details of the loss calculation
Quality of the data in the PH profile and references to data sources

0 Datum not a measured estimate

0 Datum not specific to maize

References and individual loss figures % for small farms

Stages	Loss figure	Reference	Origin of figure: Cereal	Climate	Farm type	Method
	2.0	Boxall R.A. - 1998	0	0	1	0
	9.9	Grolleau M. - 1997	1	0	1	0
	5.8		1	1	1	0
	9.5		1	1	1	0
	5.0		0	1	1	0
Harvesting/field drying	6.4		1	1	1	0

Title: Grains post-harvest loss assessment in Ethiopia.

Source: Final report NRI Report No 2377. Natural Resources Institute, Chatham, UK. pp 44.

Author: Boxall RA

Year of publication: 1998

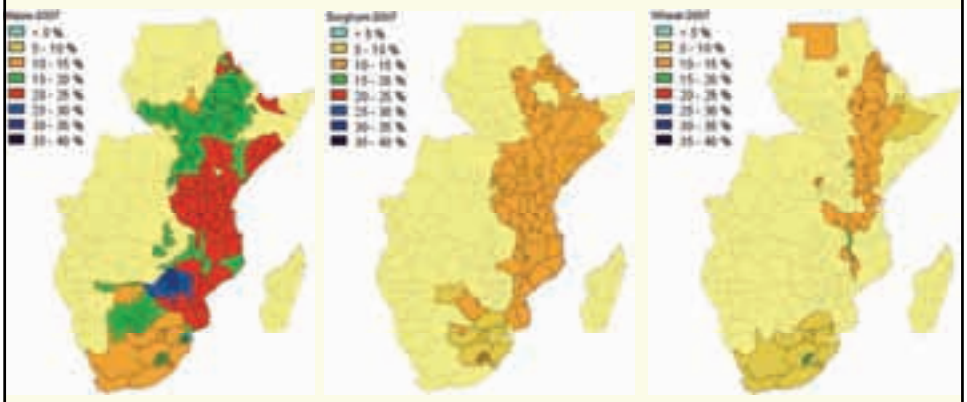
Geo focus: Ethiopia

The reference to Boxall 1998

l specific to maize

Data overall not measured

The PHLs are also displayed on maps



Maize Sorghum Wheat

Conclusions

APHLIS generates PHL estimates for cereal grains that are -

- Transparent in the way they are calculated
- Contributed (in part) and verified by local experts
- Updated annually with the latest production figures
- Based on the primary national unit (i.e. province), with possibility to be customized (calculator)
- Upgradeable as more (reliable) loss data become available
- In the process of becoming standard PHL figures in national cereal balance sheets

Vision for the future

- Many possible developments to provide broader support to the PH community Enlarge the network for PH practitioners to meet in virtual and real space. A new hub for PH development
- Combined with market information (RESIMAO)
- Become the reference forum for PH operations discussions:
  - agricultural information relevant to the cereals PH sector
  - PH projects current, and past, what works and what doesn't, what has impact (to become an 'institutional memory)
  - The focus point for a new community of practice for PHL reduction
- Would benefit from multi partner support for long term sustainability!

FAO/AfDB Cooperation on Post-Harvest Losses Reduction in Sub-Saharan Africa

Findings and recommendations

by
Julia Seevinck, TCI
Divine Njie, AGS

FAO/AfDB cooperation

- PHL reduction is key aspect of AfDB's African Food Crisis Response
- PHL is a priority area of FAO-AfDB cooperation
- Cooperation along 2 major pillars:
  - Pillar I: Screening of ongoing AfDB agricultural portfolio; and sensitization/training of AfDB staff
  - Pillar II: Preparation of Framework Paper for a Continental Program of PHL reduction in SSA, based on rapid country needs assessments

Pillar I

- Screening of AfDB projects
  - Carried out in late 2009 and early 2010
  - Involved TCI and technical Divisions of FAO - AGS, AGA and FII.
  - Four operations screened:
    - Mozambique - Fish
    - Benin – Meat and milk
    - Ghana – Horticultural products and cassava
    - Malawi – Maize and vegetables
- Sensitization & training
  - To be implemented in 2010

Pillar I

- Some findings of screening exercise:
  - There is scope for incorporating value chain analyses to identify critical points where PHL occur along the chain and opportunities for reducing them
  - Opportunities exist for reducing PHL through establishment and/or support to farmer groups in capacity building in post-harvest handling, value-addition, business management and marketing skills

Pillar I

- Some findings of screening exercise, cont:
  - Heavy infrastructure investments have been made at isolated points along the chain, but not based on cost-benefit analyses
  - There is scope for improving marketing linkages between chain participants to ensure sustainability of infrastructure investments and provide incentives for reducing PHL

Pillar II

- Framework Paper for PHL reduction in SSA
  - Objective of the Paper
    - Provide evidence for PHL needs & opportunities
    - Inform ADF-12 discussions (Late 2009)
    - First step for development of AfDB's PHL reduction strategy
    - Building block for AfDB's Agro-Industry Strategy
  - Steps in the preparation of Paper
    - Desk review by NRI coordinated by AGS Division
    - Rapid country assessments - field missions (6 countries) and questionnaires (8 countries)
    - Document finalization by AGS

Pillar II: Rapid country assessments

- Analysis of country-wide issues affecting post-harvest situation under the following themes:
  - Storage and warehouses
  - Market infrastructure
  - Market information
  - Agro-processing
  - Transport systems affecting produce movement
  - Rural finance
  - Investment climate
  - Services related to PHL (research, extension, etc)

Pillar II: Rapid country assessments

- Situational analyses of constraints and opportunities for main commodities in the following sectors:
  - Grains (cereals, pulses, oil seeds)
  - Roots and tubers
  - Fruit and vegetables
  - Livestock products
  - Fish

Pillar II: Rapid country assessments

- Policy and institutional framework
  - Policies and strategies related to post harvest
    - Actions prioritized in PRSPs, agricultural development strategies and other relevant sub-sector strategies;
    - strategic priorities for target commodities
  - Public and private institutions involved in post harvest activities

Pillar II: Rapid country assessments

- Ongoing and planned activities
  - Public institutions
  - Donors (technical & financial partners)
  - Private sector

Pillar II: Rapid country assessments

- Government interest in PHL reduction
- Opportunities for AfDB intervention
  - Analysis of ongoing AfDB projects (i.e. for potential to integrate PH issues)
  - Scope for new projects

Pillar II: Grains - PHLs

- On farm
  - Breakage, scattering
  - Insect infestation
  - Lack of drying capacity
- Marketing
  - High price variability due to seasonality in production and limited storage capacity and small financial reserves
  - Lack of price incentives to improve quality

12

Pillar II: Grains - Interventions

- Support uptake of improved technologies for harvesting, drying and storage
  - Facilitate access to finance
  - Technical support
- Introduction of long storage and resistant varieties coupled with TA

13

Pillar II: Grains - Interventions

- Create/support farmer groups for assembling and storing grain of a specified quality
- Improve market information systems
- Pilot warehouse receipt systems
- Develop and enforce grain standards

14

Pillar II: Recommended areas for PHL interventions

- Institutional framework and policy issues
- Markets
  - Market development
  - Market information
- Rural infrastructure
- Financing and risk mitigation
- agribusiness development
- Research & technology improvement
- Training and capacity building

Pillar II: Implementation strategies

- Complement other on going initiatives:
  - African Agribusiness and Agro-Industries Development Initiative (3ADI) and the Abuja Declaration of 10 March 2010
  - ICA interventions
  - WB project on basic grains
  - CAADP (Pillar 2; and country compacts)

Pillar II: Implementation strategies

- Integration in other areas of AfDB's work, especially those targeting primary production
- Support to private sector and PPPs
- Gender mainstreaming
- Environmental sustainability

Recent developments

- AfDB Programme for Post-Harvest Losses Reduction in Africa 2010 – 2014 (PHLP)
  - USD 1,692 million

Thank you

Purchase for Progress (P4P)

Connecting Farmers to Markets

WFP World Food Programme

Three Fundamental Components

Connecting Smallholder Farmers to Markets through Market and Agricultural Development

Innovative Procurement Modalities
Pro-smallholder competitive tendering
Direct contracting
Forward contracting

Supply-side Partners
Providing technical expertise in agriculture & market development
Building capacity
Empowering Women

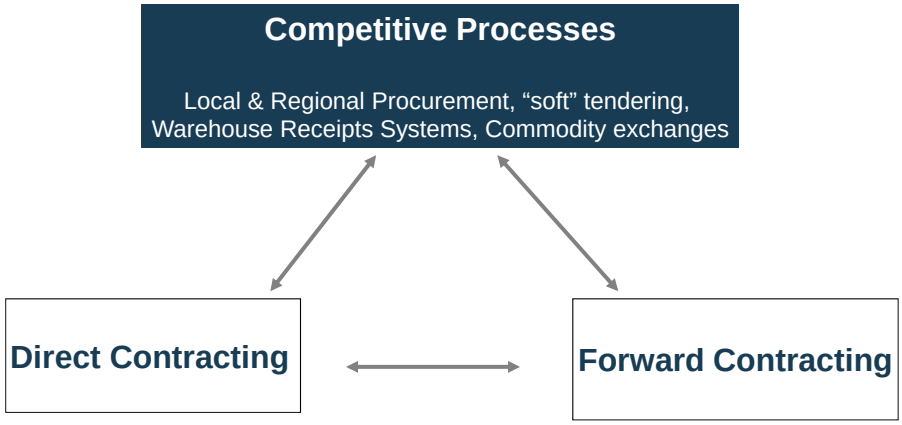
Learning and Sharing
Monitoring & Evaluation
Lessons Learned/Best Practices
Informing policy

Local procurement principles underpin P4P purchases

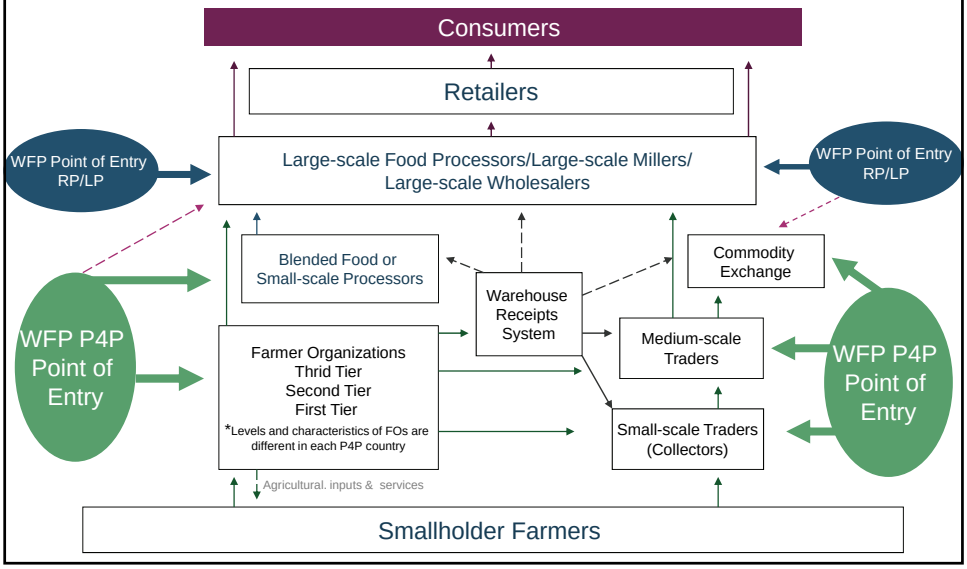
Best practices will be mainstreamed into WFP local procurement procedures by the end of the pilot

WFP Local Procurement – the Foundation of P4P
Principles of acceptable, timely and cost efficient food procurement remain the same for P4P purchases

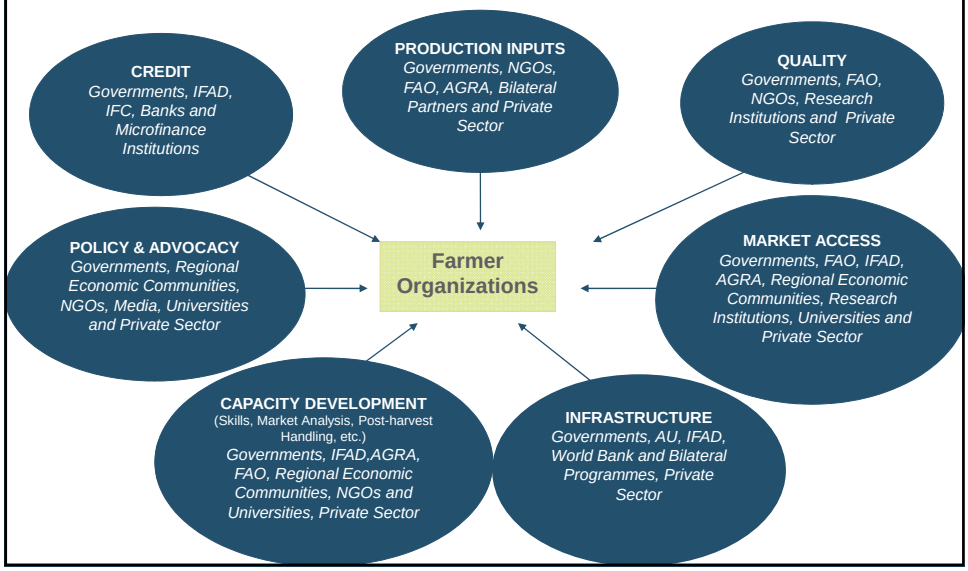
Procurement Modalities



Targeted P4P Market Entry Points



Strategic Partnerships



P4P's Two Key Questions

	Assessment Criteria		
OBJECTIVES 1 & 2 **What procurement modalities/platforms* best support capacity building and create an enabling environment for procurement from smallholder farmers?**	Group marketing capacity	Production / productivity response	Livelihood improvement

*****Modalities include direct and forward contracts, soft tendering, warehouse receipt systems, commodity exchanges*

OBJECTIVES 3 & 4 **What is the best way for WFP to balance the risks and costs associated with pro-smallholder procurement in order to optimise and transform it's local procurement practices?**	Scale of procurement, timeliness, cost, efficiency and quality/safety of procured food	Market development impact	Impact on livelihoods of smallholder farmers

Learning & Sharing

- M&E System
  - Baseline Surveys (household, farmers' organisation, traders)
  - Regular Monitoring
  - Case Studies
  - Mid and end year evaluations
- Regional Stakeholders Meetings
- Technical Review Panel
- Annual Reviews
- Website/newsletters etc

Quick Facts about P4P

Geographic Coverage - 21 Pilot Countries

- **Africa:** Burkina Faso, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Liberia, Malawi, Mali, Mozambique, Rwanda, Sierra Leone, Sudan, Tanzania, Uganda, Zambia
- **Asia:** Afghanistan and Laos
- **Latin America:** El Salvador, Guatemala, Honduras, Nicaragua

Quick facts about P4P

Global Facts

Beneficiaries: 500,000 farmers

Duration: 5 years (Sept 2008 - Sept 2013)

Total funding: US$121 million for technical capacity for 5 years (food not included)

Key donors – Bill & Melinda Gates Foundation, Howard G. Buffett Foundation, Governments of Belgium, Canada and the United States of America

Key Implementation Challenges

- Access to credit
- Weak Farmers' Organisations
- Coordination with supply-side partners
- Insufficient partnerships on productivity and capacity development
- And Quality = > Focus on Post-Harvest Loss Reduction

Post-Harvest Handling Challenges

- Specifications
  - Moisture content
  - Foreign matters
  - Mycotoxins …
- Storage availability
- Processing
  - Rancidity / Acidity in maize meal,
  - Processing … know how to match WFP's requirements

Challenges: Specifications

- Definition: National, Codex or WFP
- SAFETY & QUALITY criteria
  - Flexibility in 'quality'
  - No FLEXIBILITY for safety parameters

⇒The biggest challenge is UNDERSTANDING by Farmer Organisation (FO) and 'inspections' of small food lots

Solutions: Specifications

- Selection of commodities based on risk assessment
- Pre-screening of commodities by WFP staff or supply-side partners, e.g. the blue-box
- Formal inspection before distribution, to ascertain the safety.

⇒ Advantage 1: limited risk for FO and WFP
⇒ Advantage 2: visual inspection, sampling is 'easy' (except for mycotoxin)
⇒ Advantage 3: Feed-back is instant (for improvement) & trust is built over time with FO

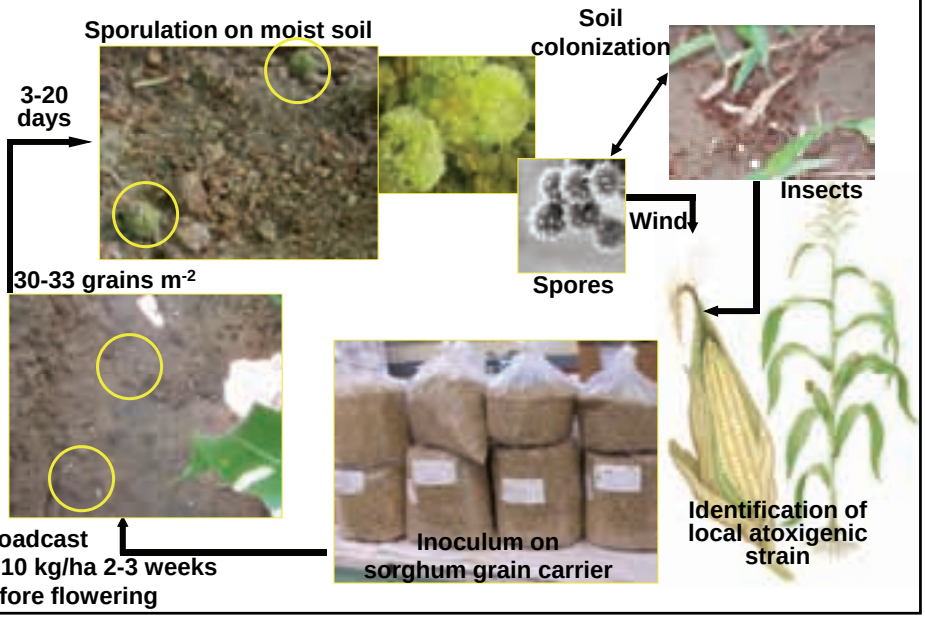
Challenge: MYCOTOXIN

- Aflatoxin
- Various levels / country

Solution (s): Limited

- Quick drying & Good storage
- 'Testing' (assuming sampling is well done) / ISO 24333/2009, EC 401/2006 … are kits a good solution for the field?
- Biocontrol (Aflasafe from IITA, with USDA, AATF, MycoRed, IPM) www.iita.org

How does Biocontrol Work?



B-aflatoxin in stored maize grains from untreated and atoxigenic treated plots

Location	Treatment	Stored		Poorly stored	
		Aflatoxin (ppb)	Reduction (%)	Aflatoxin (ppb)	Reduction (%)
Ibadan	Control	42	73	2408	96
	Treated	11*		105**	
Ikene	Control	54	91	956	93
	Treated	5*		62**	
Zaria	Control	73	85	7561	95
	Treated	11*		343**	
Mokwa	Control	50	86	2481	94
	Treated	7*		149**	

* $P < 0.05$, ** $P < 0.01$

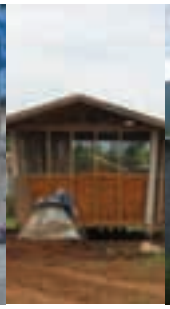
Challenges: Storage

- Good storage at community level
- Good bagging

Solutions: Storage

- Provision of mobile storage, or FAO silos, or investment in long-term storage facilities
- Bagging is provided by WFP




Challenge: Processing

- Rancidity (PV, AnV) / Acidity (FFA) of maize meal [DRC]

Solutions: Processing

- Option 1: mixing with antioxidants (?)
- Option 2: de-germing + extrusion cooking of germs and brans
- Option 3: de-germing + Infra Red toasting of germs and brans.

Challenge: Processing

- Know-how in food processing for specific foods

Solution: Complete Solution

- Pre-assembled, fully electrically wired, unit pre-tested, pre-training on manufacturer site
- Plant layout (site, waste, energy, water, storage, access, security),
- Plant operation & control (incl. health & safety: noise, fire, etc.),
- Quality manual (for processing),
- Lab guide (for analysis)

Containerised food production units




http://www.wfp.org/purchase-progress/
http://foodquality.wfp.org

World Bank Review

Postharvest loss (PHL) reduction for cereal grain staples in Sub-Saharan Africa

Rick Hodges, Ben Bennett
Paul Mwebaze and Tanya Stathers
Natural Resources Institute, UK

Broad scope of the study*

Reviewing PH **technologies and practices** to gain an understanding of -

- Public and private sector responses to PHLs over the last two decades
- PHL reduction along grain value chains
- Emphasis on farms, villages and traders
- New developments in PH handling
- Important factors affecting adoption of PHL interventions.

* Complementary to AfDB/FAO Framework report

Objectives of presentation

- To provide an overview of the review process
- To consider the importance of cereals and justification for action to reduce PHLs
- To mention some successful approaches
- To discuss and refine the conclusions of the review

What are PHLs?

Postharvest losses fall into three categories:

- Physical losses resulting from spoilage where the product is diminished by weight and/or quality and sells for less or does not sell
- Opportunity losses where sales might be lost or only be made in a lower value market, and
- External losses that fall on both the value chain participants and the rest of society, e.g. where the chemical pesticides used to protect grain impact on the environment or human health.

Why reduce PHLs?

PHL reduction activities can:

- Increase grain supply and food security without wasting other resources such as land, labour, water and inputs
- Help keep food prices lower
- Improve food safety
- Create employment and income opportunities through processing and marketing
- Reduced labour costs especially to women

What recent changes affect PHLs?

The SSA rural context has changed since PHL were last focused on. Drivers include:

- Urbanization and HIV/AIDS which mean rural labour is at premium
- Substantial population growth
- Reduced soil fertility and CC reducing agricultural productivity
- Integration of regional and international grain marketing
- Erosion of PH expertise

Approach to the study

- **4-person team**
  - Postharvest systems/technologies
    Rick Hodges and Tanya Stathers
  - Economics/marketing
    Ben Bennett and Paul Mwebase
- **Desk study**
  - Published and 'grey literature'
  - Questionnaire survey of experts
  - Key informants
- **Study duration** – 49 person days

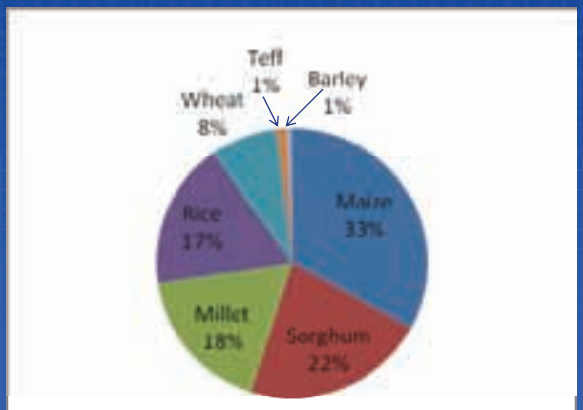
Study database (report annexes)

- Questionnaire survey
- Project profiles (26 projects)
- Overview of PHL approaches by organisation (24, E. Africa)
- Preliminary inventory of projects by theme (98 projects)

Methodological constraints

- Difficult to locate all projects with PH elements
- Some agencies don't keep records re PH projects (USAID max. 5 years)
- Very difficult to get PH experts to respond, though 50% pretty good response rate
- Very little impact assessment conducted/ available on PH projects

Importance of cereals in SSA (1)



Proportions of at least 133 million tonnes

Commercial farming has little interest in sorghum and millet

Importance of cereals in SSA (2)

Mean household income shares in SSA

Enterprise	% of total income		
	1994/1996	2001/2002	2003/2004
Crop production (of which)	70.6	69.1	72.5
Cereals	**37.3**	**38.3**	**35.1**
Roots and tubers	13.2	14.2	17.7
Beans and oilseeds	7.3	8.3	9.6
Non-food cash crops	2.0	2.4	5.5
Fruit and vegetables	5.0	5.9	4.6
Other crops	5.2	-	0.1
Animal products	3.4	2.8	5.1
Off-farm activities	26.0	27.7	21.7

Source: FAO Statistics, Jayne et al., 2001

PHLs in the PH chain

Physical losses and Opportunity losses

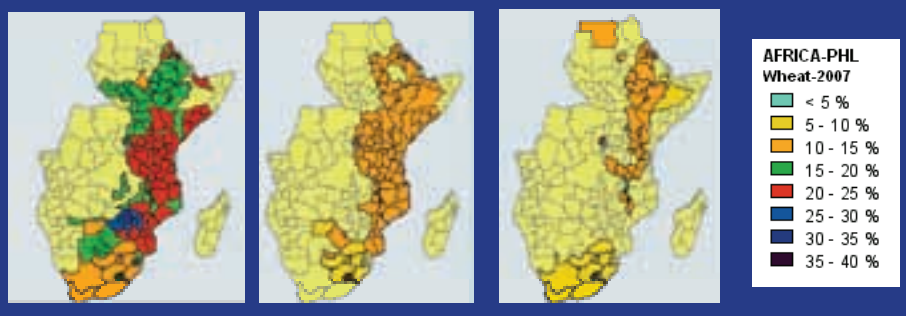
Slide courtesy of Martin Gummert, IRRI

Critical factors leading to PHLs

- Grain scattered or crushed during harvesting, handling, processing, transport
- Biodeterioration
  - Moulds - poor drying, rain at harvest
  - Insects - poor drying, easy access
- Exacerbated by poor hygiene
- Inefficient processing technologies
- Poor market access and information asymmetry

Extent of PH weight losses

*A*PHLIS – a cereals losses network for East and Southern Africa *



Maize **Sorghum** **Wheat**

* 16 countries

Value of PHLs (weight losses)

Value* of cereal weight losses from 16 countries of E & S. Africa estimated at -

US$3.8 billion/annum

Assuming the same loss rate in the remainder of Africa then total loss valued at -

US$11.8 billion/annum

If Republic S. Africa is excluded then loss valued at-

US$10.8 billion/annum

* Loss estimates equal the weight loss from APHLIS x prices (2007)

Benefits of PHL reduction

- Weight loss reduction - marginal reduction of 1% per annum = US$100 million
- Opportunity loss reduction - better livelihoods
- Safer and better quality food - better health
- Stronger markets - improved economy
- Greater food availability - reduced food insecurity
- Reduced energy cost of food production

Donor response typology and chronology

Year	Development aim or theory	Intervention	PH intervention approach
1970s	Food self sufficiency Import substitution	Community stores Central storage	Technology push
1980s	Structural adjustment Farming systems Participatory approaches	Grain banks Improved on-farm storage	Piecemeal
1990s	Farming systems Participatory approaches	Warehouse receipts Marketing information systems	Market/business
2000s	Export orientation Free trade Innovation systems Learning alliances	Commodity exchanges	Value chain

Interventions in the value chain

Questionnaire survey

20 experts working in SSA in the field of cereals postharvest identified -

- Priorities points for interventions in PH chain (specific to location and cereal type)
- Past projects with noticeable impacts positive impacts
- Priorities for future developments

Respondents areas of experience

50% - storage entomology
45% - storage technology and agric. engineering
25% - policy processes
20% - agricultural economics

Questionnaire survey – priority interventions in the PH chain (N = 19)

Questionnaire survey – future priorities (N = 20)

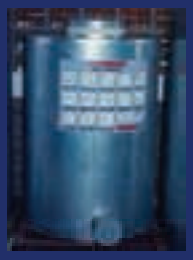
Successful approaches

Technologies – for individuals

A wide range that could be used for PHL reduction, critical factor is their relevance to situation, acceptability and C:B.

Mud silos

Super bags



Metal silos

Successful approaches

ASI Thresher

Technologies - for groups

IRRI 2-wheel tractor

Grain cocoon

Successful approaches

Institutional arrangements

Co-operatives and community grain banks have underperformed. Inventory credit and warehouse receipts seem to offer greater potential.

Inventory credit - Madagascar 'Village Community Granaries' 19,800 tonnes paddy in 2008.

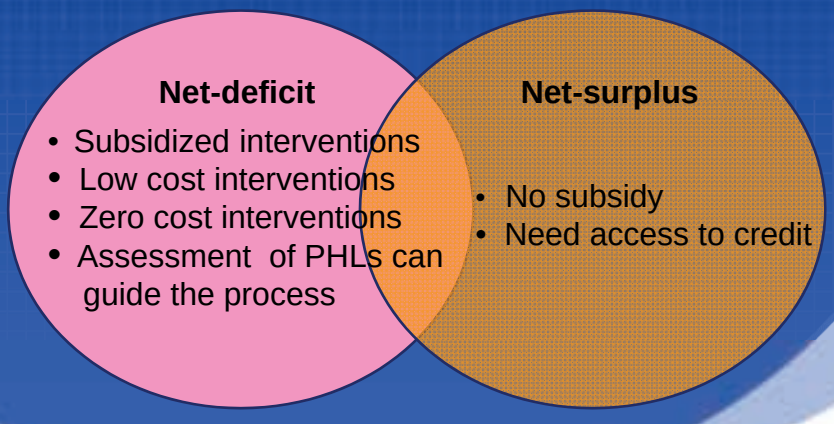
Warehouse Receipt (WR) - nascent systems in Tanzania, Malawi, Kenya and Uganda.

Findings on PHL reduction

PHL loss reduction is an excellent 'call to arms'

- But for most situations the approach needed is postharvest development throughout the value chain – this can lead to PHL reduction (because it increases profits)
- Except for interventions for some net-deficit producers who are not in a position to generate a better income from loss reduction

Findings and their implications



Findings and their implications

Notwithstanding the needs of net-deficit producers

Comment – Shaun Ferris

I do not believe that we should continue to fund projects that only consider specific point upgrades. Rather, projects should take a market chain support role, involving the range of chain actors working with a sector wide team to develop products and solutions.

Chain actors should be willing to co-invest and work to upgrade in the future. If actors are not willing to co-invest, then its probably an indication that the idea is not ready or that it will only work with external resources.

Findings on PHL reduction

Achieving successful adoption is key

- Most technologies and institutional arrangements to improve the performance of the PH sector are already well known.
- There will be a continuing demand for better adapted, cheaper and more acceptable options, but
- The main task is to achieve successful adoption of what PHL reduction knowledge, technology and process is already available.

Findings and their implications

Achieving adoption – socio-economic factors

- Careful socio-economic appraisal to ensure that interventions are needed and acceptable
- Direct involvement of stakeholders representing the whole value chain (innovation)
- Gender and diversity sensitive approaches
- Interventions should be long term-investments (10-15 years)

Findings and their implications

Not forgetting womens' central role in the development process

Comment – Jonathan Coulter
The PostCosecha, Central America had a particularly positive impact on women, and their ability to manage the household effectively, both as regards supply of food and hygiene. Women are major users of inventory credit schemes in Niger and Madagascar.

Findings and their implications

Achieving adoption – partnerships factors

- The public sector should approach PH improvements in partnership with the private sector
- Smallholders should receive support from the public sector/ NGOs/ donors
- Essential complementary interventions should be implemented by the private sector

Findings and their implications

Measuring success should be a strong component of future PH interventions.

- Increasingly, donors want to understand the contribution and impact of their investments
- Past success is an important component in planning future interventions
- Must find ways that success stories and failures are not lost from the institutional memory

Findings and their implications

Supportive institutional arrangements are needed.

National (project level)

- Approaches taken should be as widely-based as possible and guided by learning alliances to connect those PH practitioners (private sector, market information systems) and others (primary education, media, decision makers, etc.)
- Combine different types of key stakeholders in common learning processes to find innovative ways of promoting PH improvements
- Better representation of the PH system in agricultural policy and at least basic hygiene in school and college curricula
- Better identification and measurement of impacts

Findings and their implications

Supportive institutional arrangements are needed.

International

- Create a visible 'structure' to raise the profile of the sector and promote it
- Designed to be southern-led (at least in part) and in a way that will change the system (lead to innovation, and getting knowledge into use)
- Encourage national analysts to start thinking in terms of PHLs
- Build around existing southern network (s), e.g. APHLIS
- A new hub for PH development with an appropriate balance between virtual and real interaction
- Combined with other essential PH information to act as -
  - an institutional memory on project impacts
  - a source of market information
  - other options as these become available

WAREHOUSING, LOSS REDUCTION AND DEVELOPMENT OF VALUE CHAINS FOR GRAINS

by Jonathan Coulter
jcoulter01@yahoo.com

Presentation to FAO workshop on post-harvest losses
Rome, 18 March 2010

the NR Group

Contents of presentation

- Typology of third party warehousing systems
- Discussion of each type
  - How it works
  - Uptake & impact
- Impact on loss reduction & technology adoption
- The way forward: for warehousing and post-harvest innovation more generally

Typology of warehousing

- Private:
  - has individual clients, but no obligation to receive deposits from the public in general
- Public:
  - receives deposits from whosoever wishes to deposit, including farmers, and
  - allows for in-store transfer of ownership
- Farmer-focused approaches:
  - only farmers deposit

Private warehousing – how it works

- Main warehousing activity north of the Limpopo
  - Involves freight forwarders and collateral managers (CMs)
- CMs are most relevant to local agriculture, and include:
  - local subsidiaries of international inspection companies
  - a growing number of African companies
- Usually operate under tripartite agreements: bank, borrower + CM
  - often practice *field warehousing*, i.e. operating client's store
- Fixed charge ($1,500 per month or more)
  - + insurance charge
- Key marketing factors:
  - management systems & technical ability
  - credible insurance cover, specially for fraud

Collateral management: uptake & impact

- Mainly involved with import & export chains:
  - e.g. coffee, cocoa, cashew nuts, cotton, rice & petroleum
  - also large-scale grain traders & millers
- Helps African companies access financing:
  - and to compete with multinationals
- Little involvement with farmers or small traders
  - except in Tanzania
  - fixed cost inhibits involvement with small stores
- problems resulting from fraud & financial crisis
  - difficulty with reinsurance cover
  - some companies withdrawing or scaling back
  - alleged need for greater uniformity of contractual terms, and clarity re coverage of risk

Public warehousing

Public warehousing – how it works with agricultural supply chains

- Warehouse operator:
  - receives deposits from all-comers: farmers, traders, etc.
  - where appropriate cleans, dries & processes
  - certifies quality and grades product entering store, and
  - issues warehouse receipt (WR) to each depositor (transferable)
  - must deliver back quantity & quality as specified on WR
- The depositor pledges WR to bank as security for loan, or:
  - endorses it to purchaser, e.g. trader, miller, Government or food relief agency
  - giving rise to an in-store sale
- Public warehouses are often subject to regulatory oversight:
  - Government licensing systems, e.g.: US & Latin America
  - Oversight by trade bodies, e.g.: SAFEX Div. of Johannesburg

Public warehousing: uptake & impact

- South Africa grain marketing system (circa 12 M tonnes):
  - key to successful liberalisation in 1990s
  - >150 storage sites, issuing *silo certificates* (now electronic)
- Elsewhere in Sub-Saharan Africa:
  - Tanzania: important with coffee and cashew
  - but slower adoption with grains, due to: informality, limited bank involvement and ***policy environment***
- Start made in Uganda and Kenya, under local licensing/certification regimes
  - WFP procuring warehouse receipts in Uganda
    - local & regional procurement (LRP), under P4P
  - Kenya: strong start to bank involvement / potential for major uptake / but public procurement crowding out

Public warehousing can be highly effective in enhancing grain value chains

- due to following attributes:
  - product standardisation
  - facilitates financing of all players
  - facilitates contracting and contract enforcement
  - permits in-store sales
  - encourages arbitrage between warehouses and rapid price transmission through the supply chain
    - thus impacts on price stability
  - allows for public procurement from stock, and
  - encourages cost-efficient investment in warehouses
- but it is tough to implement due to policy, governance, scale and other factors

Farmer-focused approaches

Farmer-focused warehousing: alternative approaches

- microfinance-linked approach:
  - involving farmers, POs, MFIs and (often) re-financing bank
  - grain held under 'dual key' arrangement
  - farmers use loan for consumption and/or income-generating activities
  - farmers dispose of grain individually in lean season
- cooperative approach:
  - collective storage and marketing of grain
  - bank loan secured by stock provides cash for first payment
  - may involve link with pre-harvest finance
- construction of warehouses often aid-assisted

Farmer-focused approaches: uptake & impact

- Mainly Madagascar, Mali, Tanzania and Niger
- Togo & Ghana (?) discontinued
- Total estimated volume around 90,000 tonnes / annum
- Of which 55-60,000 tonnes in Madagascar:
  - almost entirely paddy rice
  - system built on strong rurally-based mutual MFI's
  - highly decentralised system: stock held in >9,000 small stores
  - positive knock-on effect on agricultural lending, and
  - significant impact on national price stability
- Niger: diversity of commodities
  - supported by non-mutual MFIs with bank refinancing
- Potential for further growth

Impact of warehousing on loss reduction & technology adoption

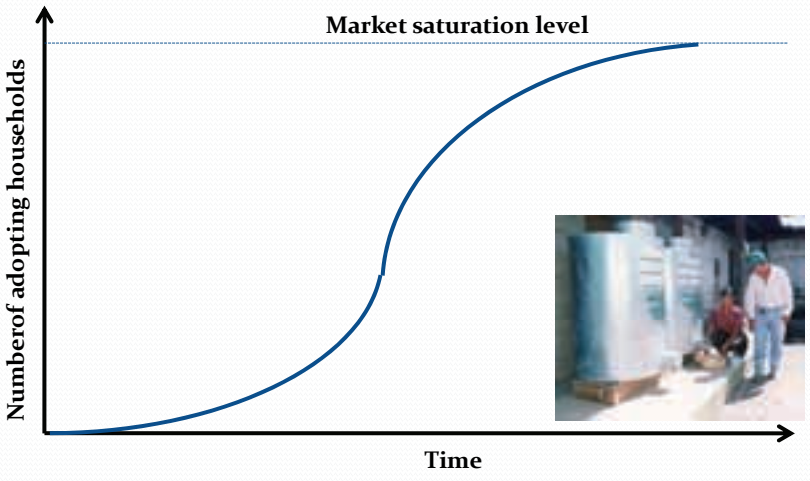
- All approaches are generally effective in reducing storage losses (where they are significant)
- They complement the role of on-farm storage
- They impact positively on adoption of improved production technology:
  - noted in Madagascar, Mali and Niger

The way forward

We need *Social Marketing* rather than *Technology Transfer*

- *Systematic application of marketing, alongside other concepts and techniques, to achieve specific behaviour goals, for a social good*
- Some distinctive features:
  - sequential approach, starting with generation & testing of ideas
  - segmentation and targeting early adopters
  - tracking adoption, learning reasons for acceptance and rejection
  - adapting the innovation and promotional package accordingly
  - periodic assessment of sustainability without project support, and
  - frequent feedback loops / opportunity to abort at any stage
- try to use *adoption* as leading indicator of impact

Classic adoption curve



What Governments can do

- Provide a favourable policy framework, notably:
  - without road harassment and ad hoc border controls
  - rule-based market interventions, not crowding out private storage
- Support stakeholder efforts to develop warehousing and other institutional devices
  - through policy statements and practical actions
- Special incentives, in support of well-conceived initiatives, e.g.:
  - enabling legislation
  - tax exemptions
  - 'regional warehouse' status
  - Central Bank re-discounting

Private warehousing: specific recommendations

- Collateral management matters!
- International agencies should work with the industry to:
  - develop global CM standards for selected commodity groups
  - develop standard contract forms with clear risk definitions
  - gain approval from relevant trade associations, financial institutions, Governments and international organisations
- and promote effective *arbitration* of trade disputes

Public warehousing: specific recommendations

- Best opportunity probably in East Africa:
  - trading structures somewhat closer to South Africa
  - demand from leading food processors + WFP
  - stakeholders making serious attempt to organise through Eastern African Grain Council (EAGC)
  - EAGC may certify parastatal stores as public warehouses
- International agencies should support:
  - where they foresee regulatory systems of integrity, and financial viability
  - in a wholehearted fashion, so as to increase viability
  - WFP's local & regional procurement (LRP) can 'prime the pump' – create initial source of demand

Farmer-focused approaches: specific recommendations

- Governments to encourage development of strong MFIs with rural outreach:
  - professional regulatory system, linked to regulation of banks
  - in case of mutual MFIs, favour emergence of strong self-governing networks
- Promote patiently:
  - monitor & evaluate → reformulate → scale up etc.
  - with a view to supporting sustainable approaches
- LRP can work with the cooperative variant
  - need for caution / periodically check cost & sustainability

The role of international agencies is crucial

- long-term thematic support
- allow operational flexibility within projects
  - realities on ground are sometimes out of line with project design
- strategic approach, focusing on sustainability
  - pragmatism with poverty and social objectives
- coordination and mutual learning
- exploit synergy between LRP and market development
- support for training & capacity-building

International agencies should establish a post-harvest network

- Aim to increase cost-effectiveness of support
- with following activities:
  - share information among themselves, with Governments and the public
  - find out what works and why (testing systematically), and
  - assist in scaling up the most promising
- managing committee and secretariat
- named agency staff and associated experts
- wired into agency decision-making processes

Main conclusions

- All three warehousing approaches merit judicious support:
  - Private: a basis for the warehousing profession / important to a wide range of value chains
  - Public: far-reaching impact on grain value chains
  - Farmer-focused: contribute to local livelihoods, crop intensification and food security
- All contribute to reducing storage losses
  - But PH development needs broader organising principles
- International agencies should establish post-harvest network

Discussion points raised by participants follow:

International agencies to establish a post-harvest network/community of practice

- Aim to increase cost-effectiveness of support to PH innovations in staple food crops & oilseeds
  - Focus on ***viable innovations*** rather than ***losses***
- activities:
  - sharing information
  - systematic evaluation of innovations, and
  - assist in scaling up
- Some similarity to Commodity Risk Management Group (CRMG):
  - but with much broader remit

Structure & operation

- managing committee and secretariat
- named agency staff and associated experts
- wired into agency decision-making processes
- Sub-groups on specific topics, e.g.:
  - producer organisations
  - market information
  - inspection & collateral management
  - public warehousing
  - infrastructure
  - etc.

Example: sub-group on public warehousing

- Focus on East Africa, esp. Kenya & Uganda
- Kenya's strengths:
  - relative strength of formal sector players, incl. banks
  - organisation of stakeholders (EAGC etc.)
  - interest of food processors
- Uganda's strengths:
  - liberal grain marketing policy
  - substantial LRP purchases
- Tasks:
  (1) assess viability for large scale implementation in 5 years;
  (2) agree coordinated support package accordingly
- Operating principles:
  - volume business
  - strong W/H operators taking full responsibility for quantity & quality
  - strictly *all-comers* approach

Re collateral management, an international agency (IFC or other) should:

- work with the industry to:
  - develop global CM standards for selected commodity groups + standard contract forms with clear risk definitions
  - gain approval from relevant trade associations, financial institutions, Governments and international organisations
  - promote with banks
  - and promote effective *arbitration* of trade disputes

The way forward (1)

- Community of practice
- Knowledge management
  - Definition of best practices
  - Lessons learned
  - Need for peer review among international agencies
- Adaptive research
  - Resources
    - WB: funds for meetings etc + trust fund money for POs etc.
    - AfDB: needs to check on avb of grant funding to support effort
    - EU: can fund multi-country work
    - USAID: coming back into the fold
    - Francophone countries
  - Political will
  - Social marketing

The way forward (1)

- Community of practice
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    - EU: can fund multi-country work
    - USAID: coming back into the fold
    - Francophone countries
  - Political will
  - Social marketing

The way forward (2)

- Regional/national dimensions
  - Need to involve Governments, ASERECA, CAADP?
  - but international agencies need to agree their approaches first
  - concentrate on Southern Africa
  - Private sector partners
- Commodity focus
  - grains, broadly interpreted to include cereals, pulses and oilseeds
- Need marketing campaign with sex appeal
- Presumed centre is FAO/AGS
- Participants:
  - CIRAD, NRI
  - GTZ
  - USAID
  - WB, AfDB
  - UNIDO
  - WFP
  - UNCTAD/IFC – to engage with international private players
  - AGRA

AFRICAN DEVELOPMENT BANK GROUP

Programme for Post-Harvest Losses Reduction in Africa (PHLP) 2010-2014

Ulrich Boysen
Agriculture and Agro-Industry Department (OSAN)
FAO/WB PHL Workshop Rome, 18-19 March 2010

Strategic Framework

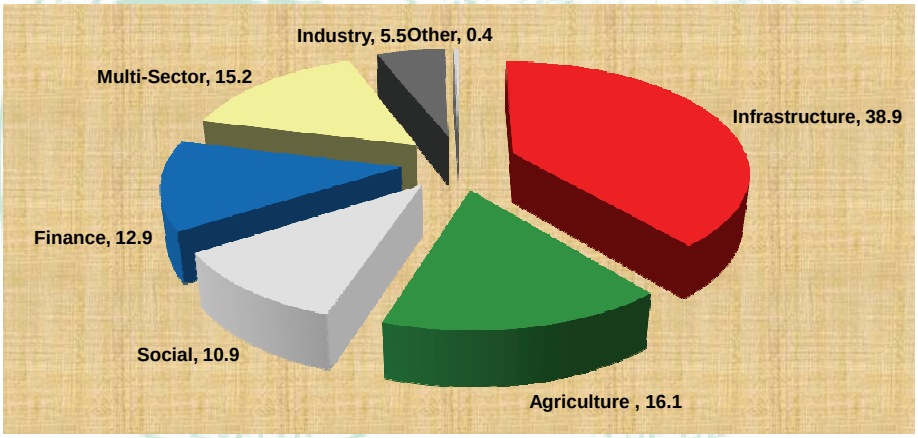
- **ADB Medium Term Strategy, 2008 – 2012**

➢ **Vision: To be recognized as preferred partner in Africa, providing high-impact, well-focused development assistance and solutions**

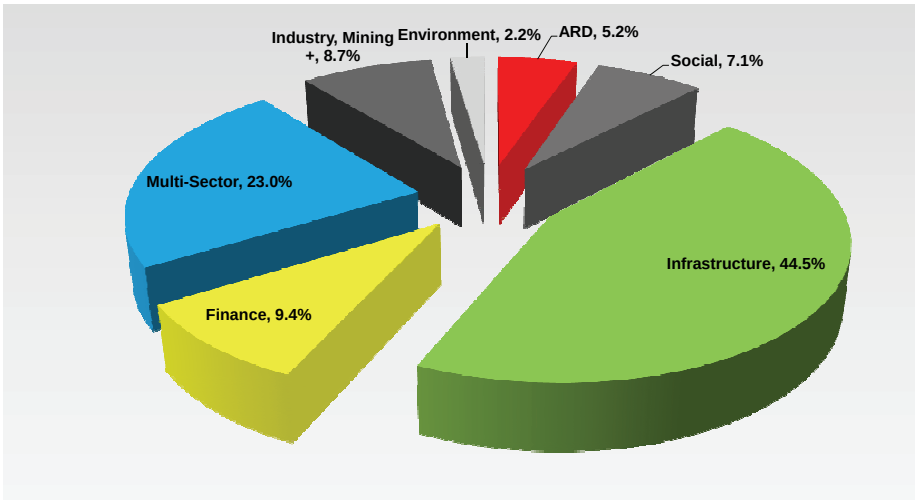
➢ **Priority Areas: Infrastructure, Governance, Private Sector, Higher Education**

➢ **Investment Support: Poverty Reduction, Agriculture, Regional Integration, Human Development**

Bank Group Approvals, 1967-08 (% by Sector)



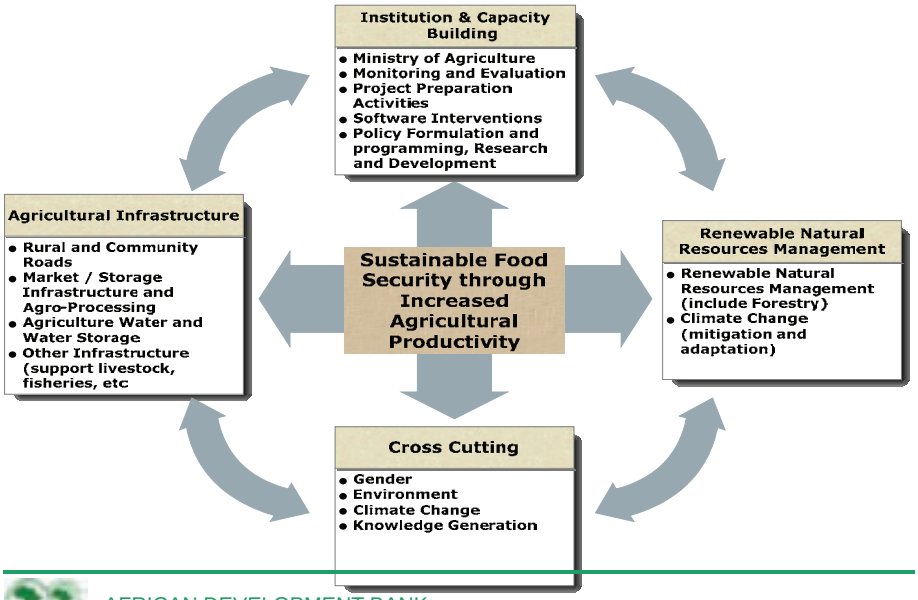
Bank Group Approvals, 2008: % Distribution by Sector



Strategic Framework

- **AfDB Agriculture Portfolio**
  - ➢201 active operations (Public sector); Volume of Euro 2.310,85 Mio.; Approvals in 2009: Euro 350 Mio.
- **AfDB/IFAD Joint Evaluation**
  - ➢Concludes AfDB should remain engaged in the Sector, but should be more focused, selective and innovative
- **New Agriculture Sector Strategy (AgSS) 2010-2014**
  - ➢Shift in emphasis from increasing food production to support of market orientation and optimization of post-harvest systems
- **Three major work programms under preparation**
  - ➢Business Plan for Water
  - ➢Capacity building for Agricultural Ministries
  - ➢Programme for PHL Reduction in Africa

Agriculture Sector Strategy (AgSS) – Bank Focus



Key Agricultural Sector Performance Indicators by 2014

Outputs		Outcomes
1. 10,000 KM of rural roads built and/or rehabilitated	4. 50,000 people trained in good agricultural practices	1. Yield Increase: 15-20%
2. 500,000 Ha of land under improved water management**	5. Twenty five percent decrease in agricultural land and forests degraded	2. Reduction in post harvest losses 3% over six years (0.5% per year)
3. 8.5 billion Cubic meters of water mobilized for multiple purpose development**	6. Seventy five percent of Bank agricultural operations are climate proofed	3. Production increase: 5% per annum

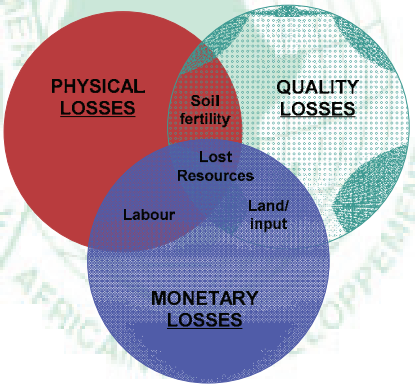
**Prepared and secured necessary investments by 2014 for operations to develop 500,000 ha under improved water management and increased water storage capacity by at least 8.5 billion cubic meters.

Programme for PHL Reduction in Africa 2010-2014

- **Background and Rationale**
  - The reduction of PHL has been identified as one of the key medium-long term areas of intervention in the African Food Crisis Response (AFCR) – Focus of PHLP on Food Crops
  - Food security can be improved by saving food. This will have an immediate effect on increasing agricultural productivity
  - Reduction of PHLP cuts across the whole supply chain and is perceived as an important step for agro-industrial development
  - PHL interventions have shown high internal rates of return and therefore positive benefit-cost ratios
- **Programme Preparation in 2009**
  - Development of Background Paper and Programme Framework
  - Screening of on-going portfolio and pipeline projects

Framework Paper: Importance of PHL

The annual quantitative PHL of cereal grains, roots and tuber crops, fruits and vegetables, meat, milk and fish in Africa are estimated at around 100 million Tons with a monetary value of US$ 48 billion



In addition to the physical losses, PHL also includes loss of quality and market opportunity and lost resources

Framework Paper - Commodities and PHL

Commodity Groups	Estimated PHL	Key Areas of Intervention	Remarks
Grains (cereals, pulses and oilseeds)	***15 - 30%***	***Technology for harvesting, drying and storage of grain***	*15% of physical PHL means 15-20 million tons of cereals p.a. in SSA*
Fruits and vegetables	***15 - 44% (up to 70% in some cases)***	***Processing, cold chain and market chain efficiency***	*Highly perishable and overproduction periods have a big impact on PHL – Market info is key*
Roots and tubers	***10 - 40%***	***Variety development, handling practices and processing into products with longer shelf life***	*Highly perishable commodity group*
Livestock	***In Uganda approx. 27% of all milk produced is lost***	***Interventions in the cold chain and transport efficiency***	*Livestock products are highly perishable and lose value very quickly in the absence of a cold chain*
Fish	***10 - 40% (mainly quality losses)***	***Processing and storage practices (cold chain)***	*Highly perishable. A key consideration associated with PHL of fish is the environmental impact*

PHLP: Programme Description

The PHLP is a five-year programme (2010-2014) with a total indicative cost *US$ 1,692 million*		
COMPONENTS	**Brief Description**	**Estimated Cost (US$ millions)**
Policy formulation and institutional strengthening	Capacity building for agricultural ministries	**100**
Rural infrastructure	Feeder roads, dry and cold storage, markets and rural energy	**1,142**
Technologies for PHL reduction and value addition	Preservation and agro-processing technologies	**300**
Market development	Value chain development, farmer groups, business development services, market information systems and grades and standards	**150**
TOTAL		**1,692**

PHLP Value Chain

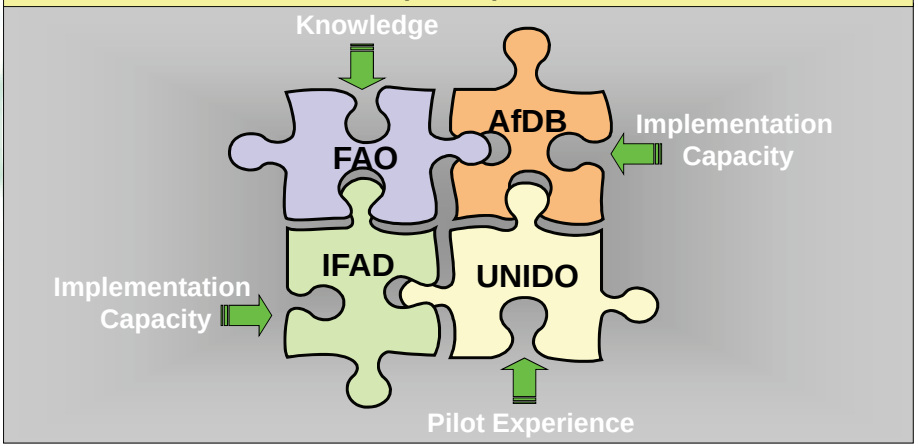
Target
- 3% reduction in PHL (physical) over 6 years, through investments mobilized and Bank interventions

Objectives
- Identify key requirements for a targeted PHL Reduction
- Mainstream PHL Loss Reduction in AfDB's Interventions
- Build capacities of RMCS

Goal
- Improved food availability and enhanced product quality in a sustainable manner

Focus on Partnerships

The Bank will promote close partnerships and synergies with other development partners



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PHLP: Areas to complement

PHLP: Four areas of intervention			
Policy formulation and institutional strengthening	Rural infrastructure	Technologies for PHL reduction and value addition	Market development

Areas to complement – Partnerships		
Research	Rural finance	Training and capacity building

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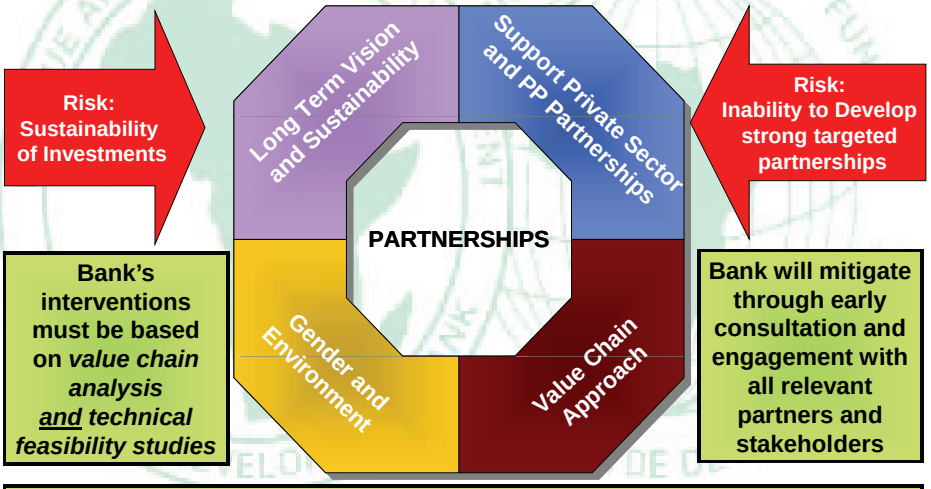
Potential Partners

Thematic areas of Intervention for PHL Reduction	Potential Partners
Policy formulation and institutional strengthening	FAO, IFPRI, WB, RECs
Rural infrastructure	FAO, WB, UNIDO, IFAD, WFP
Technologies for PHL reduction and value addition	FAO, UNIDO, GTZ, WB
Market Development	FAO, IFAD, AGRA, GTZ
Rural Finance	IFAD, FAO, AGRA
PHL Research	FAO, UNIDO, CGIAR
Training and Capacity Building	FAO, UNIDO, IFAD, GTZ

Other partners are welcome to join!

Lessons Learned and Risk Mitigation



Bank's interventions must be based on *value chain analysis* *and* technical feasibility studies

Bank will mitigate through early consultation and engagement with all relevant partners and stakeholders

Project design will be based on careful needs assessment and take into account diverse needs of stakeholders, including gender considerations

Next Steps

- **PHLP Framework Paper - Approval in Q2 2010**
- **Development of an Action Plan in Q2 2010**
  - **Operational Guidelines**
  - **Lending Programme Preparation**
    a) Mainstreaming of PHL components in Bank's operations (ongoing and new)
    b) Development of stand alone projects
- **Development of an Inventory of Successful PHL Technologies**
- **In-House Capacity Building**
  - **Workshops for Task Managers**
  - **Development of Best Practise Packages**

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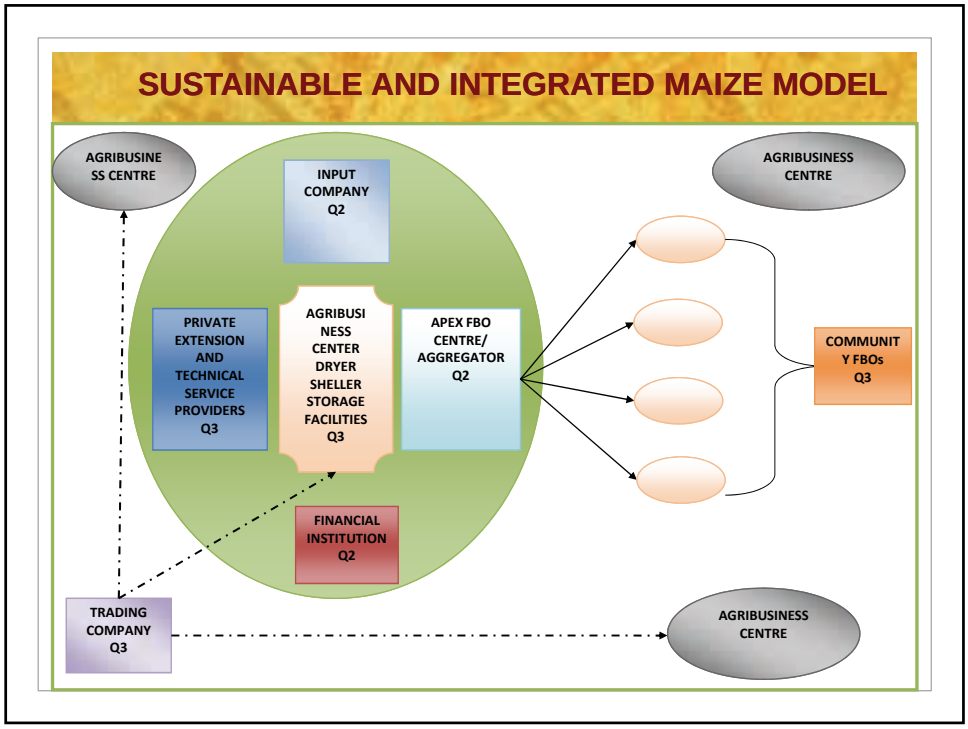
Post Harvest Management of Maize In Ghana

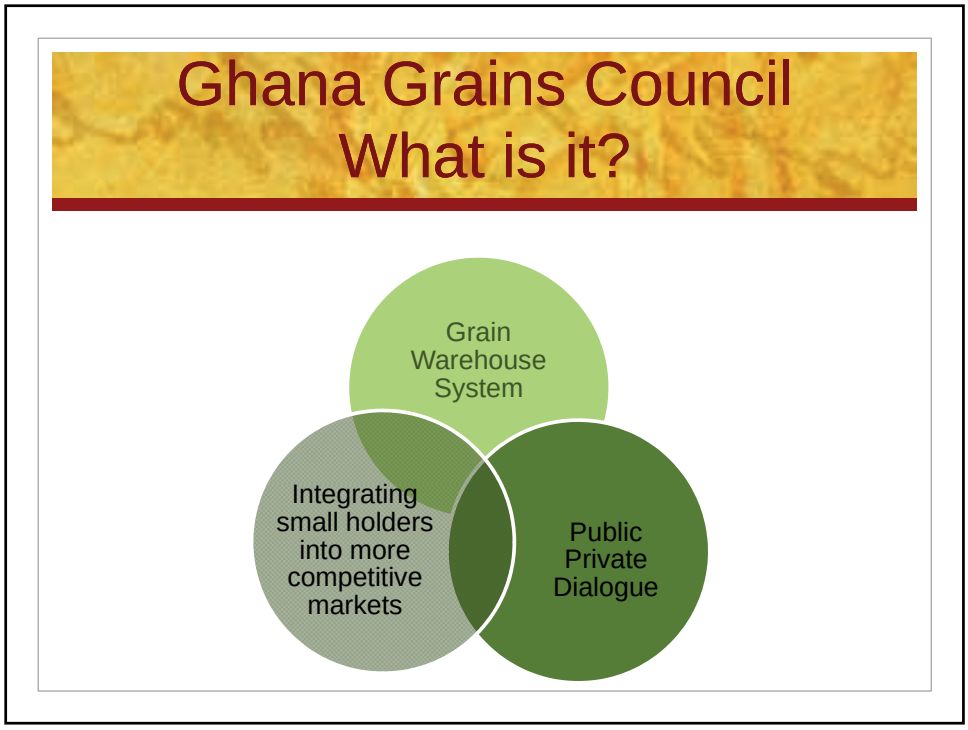
Using an Integrated and Inclusive Approach

Tom Gambrah
MD, Premium Foods Ltd.
Chairman Ghana Grains Council

Ghana Agriculture Maize

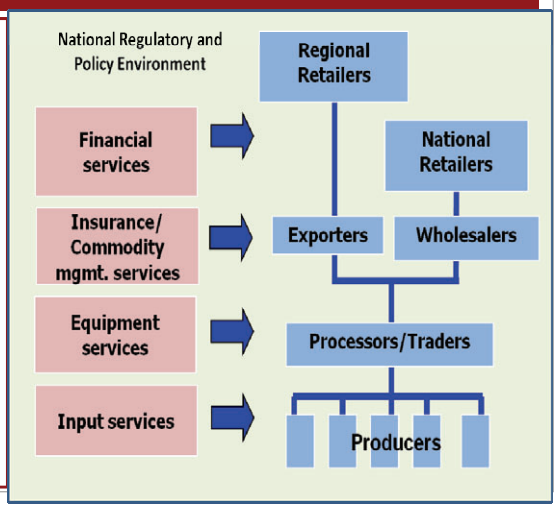
- 1.2 million tons of maize produced
- Post harvest losses of 30%
- Smallholder dominated production characterized by low yields and poor on and off farm practices
- Quality issues related to:
  - Moisture
  - Insects
  - Aflatoxin


SUSTAINABLE AND INTEGRATED MAIZE MODEL
AGRIBUSINE SS CENTRE
INPUT COMPANY Q2
AGRIBUSINESS CENTRE
PRIVATE EXTENSION AND TECHNICAL SERVICE PROVIDERS Q3
AGRIBUSI NESS CENTER DRYER SHELLER STORAGE FACILITIES Q3
APEX FBO CENTRE/ AGGREGATOR Q2
COMMUNIT Y FBOs Q3
FINANCIAL INSTITUTION Q2
TRADING COMPANY Q3
AGRIBUSINESS CENTRE


Ghana Grains Council
What is it?
Grain Warehouse System
Integrating small holders into more competitive markets
Public Private Dialogue

Ghana Grains Council
What is it?

- Limited by guarantee.
- Membership open to all value chain participants and service providers
- Industry self regulatory body
- Cost recovery through fees from Grain Warehouse Receipt system
- Initial financial and technical support from USAID Ghana (ADVANCE) and West Africa Mission (ATP).



Where is Going?

Pilot Phase	Strategic Growth Phase	Scale up and Sustainability
Year 1 to Year 2	Year 2 to Year 4	Year 4 onward
•Start Up •Strategic Mgmt Plan •Pilot project •Business Plan •Membership Drive •Platform for public private dialogue	•Strategic Investment Fund •Industry uniformity •Standards/food safety •Donor leverage to warehouse development. •Inclusivity	•Expanding volume – 150,000 MT -- •Integrate with Emerging Commodity Exchange •Regional platform for trade •Majority of SH grain through WRP

This report is a synthesis of deliberations that took place during the one and a half days workshop at the FAO Headquarters in Rome, Italy, from March 18 to 19, 2010. It is hoped that this report can serve as a reference for a community of practice on post-harvest losses reduction in grain supply chains in Africa.

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