

Effective Grain Storage for Sustainable Livelihoods of African Farmers in Kenya, Malawi, Zambia and Zimbabwe¹

April 2012 – March 2016, CHF 7'100'000.-

1 Introduction

Interest in the reduction of post harvest losses (PHL) is not new. After the mid-1970s food crisis, considerable development investment went into PHL reduction for staple crops. Unfortunately, once real commodity prices resumed their historical downward trend, the policy shifted to emphasize food security through economic liberalization and trade. To cope with increasing food demand, governments have started to emphasize increasing food production, reducing food losses during and after harvest and improving downstream activities have not been adequately addressed. Significant proportions of food produced are lost to spoilage and insect infestation along the value chain. Postharvest losses in most of Africa are up to 25% of grains, with a value estimated at over US\$ 2 billion annually. Investing in reducing post harvest losses has the potential to save household food reserves that would otherwise be lost. Lack of adequate awareness and access to appropriate technologies, make farmers sell their maize soon after harvest, only to buy it back at a higher price later in the season, resulting in a continual poverty trap. In east and southern Africa the policy and institutional environment is varied, and often not conducive to allow coordinated responses and private sector to invest in sustainable post harvest solutions.

PHL are being recognised by all major stakeholders such as *Southern African Development Community* (SADC), the *African Development Bank* and *Food and Agriculture Organization* (FAO) as a major problem. Postharvest losses have repercussions on hunger, poverty alleviation, income generation and economic growth. On the other hand besides quantitative losses, qualitative losses imply that the full nutritional value is not delivered. This is particularly important for HIV/AIDS affected population. SDC has a vast experience with metal silo technology in POSTCOSECHA programme in Central America and can contribute in east and southern Africa to the policy dialogue and share experiences with SADC, the African Development Bank (AfDB) and FAO including SDC national offices in Zimbabwe and Tanzania.

The previous phase of this program showed that metal silo technology is effective in combating losses but remains quite expensive for the poor farmers. Policy changes and incentives would provide a conducive environment to increase adoption rates of this technology. In addition based on exchanges with other donors cheaper technologies should be made available to the poor farmers, women in particular, to extend by a few months the storage of their harvest. Sharing experiences at regional level with an aim of harmonised system in SADC could enhance the national dialogue with the respective stakeholders and encourage policy changes.

2 Strategic Orientation

Lack of appropriate grain storage technologies causes in east and southern Africa on average 25% grain losses due to postharvest pests. Because of lack of awareness and access to appropriate technologies, farmers end up selling their maize soon after harvest to avoid losses, only to buy it back at more than twice the price later in the season to meet their subsistence needs, resulting in a continual poverty trap. For maize, storage losses are estimated to exceed \$100 million per annum in the eight major maize producing Southern African countries. Large-scale grain storage capacity is increasing in Southern African countries, principally through government and private sector funding, but for the smaller producer especially the women technology for keeping their production safe is limited.

Building on the successes and lessons learnt from the previous phase of the *Effective Grain Storage for Better Livelihood of African Farmers Project* (EGSP; June 2008-Feb 2011) and

¹ Project No. 7F-06300

on long Swiss experiences in Central America, the metal silo technology has proved to be effective in protecting harvested grains from attack not only from the destructive insects, the Larger Grain Borer (LGB) and the Maize Weevil (MW), but also from destructive rodents.

Besides the provision of the silo technology, the summary workshop at the end of the previous phase highlighted the importance of **policy environment** and of the **systems of collecting** the harvest at local, district or national levels including the **market context**. Within SADC many policies and systems have been put in place by the respective national authorities to ensure food security but very often these systems can create bottlenecks and market distortion for the producers.

With regard to the relative high cost of a silo, new small scale technologies, based on hermetically sealed bags, could have considerable potential to provide cheap storage for smallholders and make a substantial contribution to food security for poorer farmers, in particular women farmers. These bags would increase the time of storage by two or three months.

The project will specifically focus to the major maize producing areas of four selected countries (Kenya, Malawi, Zimbabwe and Zambia) where insect-pests have the greatest impact on maize production, food and income security, and livelihoods. Tanzania is already covered through a similar project financed directly by SDC Tanzania programme. About 16,000 smallholders will be targeted to benefit from metal silo and an additional 24,000 food insecure farmers, particularly women, will be targeted regarding postharvest bags. But the main target will be the respective Ministries of Agriculture in the SADC region so that they do take post harvest losses into consideration.

The proposed phase is coherent with SADC policy framework which identifies post-harvest losses as an important challenge. However SADC has not to date translated this challenge into regional policy objectives. Post harvest losses are formulated in several national development plans such as Zambia which targets a reduction of postharvest losses from 30% to 10% or Malawi which makes reference to it in its agricultural development plan. This project will address assist in reflecting PHL through a regional lens. It is in line with SDC's *Regional Programme for Southern Africa (RPSA) Food Security Framework* as well as with the lines of actions of the SDC *Global Programme of Food Security*. It also complements emerging efforts by the AfDB's new *Agriculture Sector Strategy 2010-2014*, which has acknowledged the need to prepare a continental programme on post harvest reduction in Africa. NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP) Pillar 2, in particular recognises as well development of the postharvest sector as driving factor for reducing poverty in Africa.

3 Objectives

The overall goal is to ensure that postharvest losses are reduced in the selected SADC countries and food security and incomes for target farmers' households are improved through informed policy, capacity building for scale up and appropriate technology.

In order to achieve this, the following outcomes and outputs are required:

1. **Target farmers increase uptake of metal silo technology building on the lessons learnt in Phase 1:** In each of the target countries the project will strategically focus on areas with a relative surplus production of maize, which is stored for several months before consumption or sales, and where storage pests are perceived as a major problem. The successful dissemination of agricultural technologies depends on partnerships and networking with organizations of similar interest in project implementation. In each of the four project partner countries, key organizations including government and non-government and the private sector will be identified to implement training of chief artisans, artisans, and farmers, and for distribution and marketing of metal silos and improved postharvest management practices.
2. **Post harvest policies in Southern Africa are conducive and harmonised in the long term:** This outcome can only be achieved in a third phase of the project. This specific phase will focus on the identification of incentives and disincentives, policy gaps and institutional arrangements for adoption of the metal silo technology and improved postharvest management practices through policy and institutional analysis.

Reviews and analysis of agricultural policies and the institutional arrangements will be conducted for project implementation to identify gaps and missing incentive structures that undermine a solid post harvest system including the diffusion of ad hoc technology in the target countries.

- 3. Alternative technologies for post harvest losses are studied and introduced to the poor farmers.** Postharvest bags for the poor farmers, particularly women will be distributed and extension services and training on how to use the bags appropriately will be provided. For this phase only, the bags will be free as they are still under testing as a technology. Research will be conducted to validate this technology, and to analyse how feasible low cost bags technology can meet the food security needs of the poor, and thereafter market forces should operate in demand and supply of bags.

Governance will be embedded in the policy outcome 2 as national systems will be compared in the respective countries. Concerning gender, women play a major role in food production. The percentage of women economically active in agriculture ranges from 45 to 60% depending of the countries. Very often the women are the smaller producers and the availability of cheap technology such as sealed bags, even if not optimal can improve their food security. Specific attention will be given to the size of bags adapted to the needs.

4 Intervention Strategy

This project will be lead by the *International Maize and Wheat Improvement Centre* CIMMYT and will interface with policy makers, private sector and other donors, particularly the AfDB and other donors who expressed interest in putting in additional funding when their program design is finalised.

The regional intervention in post harvest issues will facilitate exchange of information between SADC members regarding their own post harvest regulatory frameworks and how compatible they are in respect to regional integration and regional food security. An example of this is collecting evidence on the use of phostoxin to share with some countries that do not allow its use, despite being recommended as effective in post harvest management in combination with other instruments such as metal silos. CIMMYT will facilitate regular flow of information and promote regional learning platforms with the objective of improving technical capacity and the provision of evidence and support to national decision-makers. SDC *Global Programme Food Security* will be involved through close dialogue with the Addis Ababa based officer.

For metal silo development, the project will identify and act as a linkage point between business development services (BDS) and entrepreneurs in metal silo technology. This activity will entail the undertaking of a BDS study of the maize postharvest value chain to identify the supporting business services for maize storage and marketing along with the improvements required to catalyze the development of markets for commercialization of the metal silo as part of the holistic maize value chains in the target countries.

In order to address the poorest farmers' capacity in post harvesting CIMMYT will work in partnership with private company *Marsh-Agri* which manufactures post harvest bags and with organisations such as *World Vision*, *World Food Programme* or/and *Women in Agribusiness in Sub Saharan Africa Alliance* (WASSA) for the enhancement of the distribution of bags. As an average household requires about 250 kilos of grain to survive the critical hunger gap for a period of 3 months, 5 bags of storage capacity of 50 kg per household are proposed.

Since farmers will have to buy silos whereas bags will be distributed for free during this testing period, these two approaches will be implemented separated. The bags will be provided in other regions than the ones in which metal silos are being promoted and sold. However, market solutions for the bags will be explored before hands with CIMMYT.

In terms of policy, an analysis will be undertaken to assess the policy bottlenecks and the respective systems in place in the countries concerned and to identify potential improvements in terms of post harvest systems, postharvest technologies and their related policy environments (incentives, policy gaps, import tariffs etc.). A study of the cost structure of

inputs such as metal sheets duty, VAT and labour will be undertaken to analyse the price of a metal silo. In Phase 1 such an analysis showed that in Kenya 56% of the costs were associated with government duties and VAT. These are the policy evidence data that this project will generate to influence government policy in favour of post harvest solutions, such as reducing duty and VAT on metal sheets, or on plastics for bags.

A follow-up phase is envisaged starting in April 2016 for another 3 to 4 years. The overall budget for the whole engagement is estimated at over CHF 15 Mio.

5 Monitoring and Steering

M&E systems will be designed to cover the range of aspects that determine the project success; **baselines** for each country will be undertaken within the first 6 months of project implementation. A **review** at midterm will be done. Emphasis will be placed on integrating recommendations and lessons gathered from M&E and review into ongoing project activities and future programming. Towards the end of the phase an **external evaluation** will be conducted. The success of the collaboration will be assessed based on the following criteria:

- Inception phase
- Achievement of results based on the logical framework
- Knowledge sharing capacity
- Assessment of the quality of collaboration among partners
- Results of Policy dialogue at national and regional level

Rigorous Impact Research: Due to the size of this project, rigorous research will be undertaken for various project components. Firstly, in order to enrich the understanding of project impacts, there will be a control group research to collect data on the changes in outcomes for farmers that adopt metal silo technologies or bags and those who do not in order to provide a basis for comparison at the end of the project. Secondly, gender implications and impact disparities will be monitored and analysed. This research will enhance the quality of impact analysis to inform future project designs and share lessons in impact analysis with other projects and practitioners.