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## POST-HARVEST HANDLING AND STORAGE (PHHS) PROJECT

FINAL REPORT





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This final report was produced for review by the United States Agency for International Development. It was prepared by Nathan Van Dusen and Kristin Beyard for CARANA Corporation. The authors' views expressed in this report do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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# Introduction

Agriculture drives the Rwandan economy, accounting for 80% of employment, 36% of GDP, and 63% of foreign exchange earnings.<sup>1</sup> The agricultural sector has seen rapid growth in recent years with large increases in production achieved by smallholder farmers, 95% of whom have farms that are less than two hectares in size.<sup>2</sup> This fragmented production base leads to serious challenges in getting product to market efficiently and integrating farmers into commercial marketing channels that allow for differentiation. Among the impacts of fragmentation, small farmers lack the capital and know-how to efficiently harvest, store and market their surplus yields. MINAGRI estimates between 15% and 22% post-harvest losses in cereals as a result. Losses impact producers and consumers, reducing farmer incomes and raising consumer prices as a result of diminished supply.

As part of the U.S. Global Food Security Response and Feed the Future Initiatives, USAID's Post-Harvest Handling and Storage (PHHS) Project set out to integrate farmers into commercial marketing channels as a way of driving investment in post-harvest technology and process improvements for staple crops, particularly maize, beans, and rice. The project took an integrated public-private approach to reducing post-harvest losses and improving food security. CARANA piloted new approaches and innovations to engage policy makers, banks, civil society, cooperatives and smallholder farmers. These pilots contributed to developing a market system in Rwanda that encouraged farmers to supply higher quality grain, and built the capacity of local stakeholders (both private and public) to adopt and sustain these pilots, contributing to a more efficient staple crops value chain. The PHHS project's implementation model allowed it to be responsive to government priorities and enabled Rwandan policy makers to incorporate lessons and realities from the private sector into their post-harvest policy framework.

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<sup>1</sup> World Bank, *Project Appraisal Document on a Proposed Grant to the Republic of Rwanda for a Rwanda Second Rural Sector Support Project in the Second Phase of the Rural Sector Support Program*, World Bank, June 2008.

<sup>2</sup> Morel-Seytoux, Sylvie H. Lalonde. *Gender Assessment and Action Plan for USAID Rwanda*, WIDTech, Washington, District of Columbia, March 2002.

This report summarizes the evolution of the PHHS project in terms of objectives, activities and achievements in addition to presenting lessons learned for future programs with similar objectives. The report covers the period of the original project (September 2009 through March 2012), in addition to the 18-month extension through August 2013.

### *Methodology and Objectives*

Project activities, sectors and objectives were identified in the first two quarters of the project. PHHS carried out an opportunity mapping of sector and activity level priorities in Rwanda's commodity value chains, and as a result, developed an *Inception Report* in April 2010. The report examined the current situation in Rwanda with respect to market linkages, post-harvest investment promotion, and post-harvest management for the six targeted staple crops (maize, rice, wheat, beans/soybeans, cassava and Irish potato). Meetings were held with the major buyers/processors of staple crops, which revealed that with the exception of cassava and Irish potato, the supplies of staple crops did not meet market requirements with respect to necessary volumes and required standards. In the development of this report, meetings were held with umbrella organizations and private sector entities working with farmers' cooperatives to learn what sort of assistance is being provided to producers, as well as what constraints farmers encounter from production to marketing. Information was gathered on the regions which have the largest volumes of surpluses for each of the six targeted crops, and an assessment was made of existing post-harvest infrastructure. Trips were also made to the field to visit farmers in several districts of Rwanda, which revealed that farmers needed capacity building with respect to improved harvest and post-harvest handling practices.



## Project Objectives

The inception report prioritized maize, beans and rice as the commodities that domestic producers were most likely to be able to market successfully through commercial channels. As a result, PHHS objectives have been defined as follows:

- Mobilizing *private investment and bank finance* to develop businesses that require storage infrastructure;
- Improving *management and handling* of staple crops by farmers, in partnership with agribusiness firms and Rwandan business development service providers through a market-driven approach;
- Developing more robust *linkages* between farmers and the market by connecting producers to premium markets through intensive training by the Sell More for More Training team and other innovations including an online GPS map of producer cooperatives and Market Information System pilots;
- Assisting farmer associations/cooperatives to *expand their own warehouse infrastructure and availability of working capital* through business plan development and finance training courses to attract private bank finance;
- Increasing *MINAGRI's capacity to widen its medium-term strategy* for the development of Rwandan staple crops through improved marketing and post-harvest activities; and
- Identifying specific *market-led interventions* that can be adopted by individual players within the value chain to reduce post-harvest losses in staple crops, including investments by buyers in supply chain constraints.

<b>Budget</b>	\$8.3 million
<b>Duration</b>	4 years : September 2009 through August 2013
<b>Components</b>	1. Market Linkages and Business Development 2. Investment Finance 3. Post-Harvest Management 4. Post- Harvest Policy
<b>Targeted Staple Crops</b>	Maize, Beans and Rice
<b>Geographic Coverage</b>	Throughout Rwanda with a focus on Northern and Southern Provinces

### *Project Component Areas*

The scope of work for the PHHS project is comprised of four key components:

- 1) **Market Linkages** with firms that will result in strategic partnerships to develop business ventures and invest in post-harvest handling and storage;
- 2) **Investment Finance** that will result in strengthening supply and incomes within the maize and bean value chains;
- 3) **Post-Harvest Management** that will lead to better handling practices for farmers seeking higher prices for better quality commodities; and
- 4) **Post-Harvest Policy** support to the Government of Rwanda with the intent to improve the business environment for the private sector.



### *Project Achievements*

During the 3.5 years of the project, PHHS has achieved the following results:

- 83,676 farmers are now using storage centers through PHHS Assistance.
- 104 storage centers were constructed or rehabilitated.
- \$1.6 million USD of new investment was made in private agribusiness, particularly cooperatives, aggregators, processors and millers.
- BDS support was provided to 59 SMEs and direct assistance to 358 private enterprises.
- Over 60,000 farmers were trained in post-harvest handling and storage best practices.
- 3 policy strategies focused on improving the enabling environment at the post-harvest and marketing levels were drafted; one of these strategies, the post-harvest strategy was adopted by government.

Furthermore, the project piloted new innovations and activities that have shown impact and sustainability within Rwanda, including new financial products, capacity building methodologies, policy frameworks, and market information systems, to name a few. Many of these pilots are now being adopted by local entities to expand and scale. Additionally, the co-investment grant activities have enabled SMEs with new business ideas to access financing to pilot business practices and investments that have led to increased returns and additional financing from commercial banks and private sector investors.



## Private Sector Strategy

In developing the PHHS project's private sector strategy, CARANA collaborated with strategic buyers including the WFP and large private sector millers and aggregators to identify their needs and opportunities for improving smallholder integration into their supply chains. The PHHS project then addressed value chain constraints to the maize, beans and rice sectors by entering into partnerships with these strategic buyers and linking them to cooperatives capable of aggregating enough product to fulfill commercial contracts. The Project was successful in facilitating these linkages by supporting cooperative managers and members with business and post-harvest technical assistance, co-investment grants that were used to upgrade their post-harvest systems, and credit products that addressed working capital constraints among farmer cooperatives.

As a result of this market/demand driven approach, PHHS identified *four key private sector intervention points*:

- Partnerships with strategic buyers;
- Storage and postharvest system investments;
- Partnerships with banks to address working capital financing constraints; and
- Post-harvest and cooperative management technical assistance.

### Component I: Market Linkages Support

The PHHS project mobilized resources to address post-harvest inefficiencies upstream in the supply chain, in part, by connecting smallholder farmers more directly to formal buyers via effective aggregators (typically cooperatives and Small and Medium Enterprises (SMEs)). This approach helped project beneficiaries move away from spot selling to itinerant traders. More direct relationships with more formal buyers (usually through organized cooperatives) also served as a foundation for credit provision and improved market information, which resulted in the production of a higher quality product that can be sold at a premium price.

This shift from selling small quantities into an undifferentiated commodity market to selling a high-value, differentiated product to larger-scale buyers represented a fundamental change in the staples marketing system. Via aggregators, farmers linked to PHHS' strategic buyers are now selling a product that is in demand in the marketplace, giving them newfound bargaining power when entering transactions. The PHHS project helped farmers, cooperatives and buyers build these relationships by acting as a facilitator to stimulate direct contracting with more sophisticated buyers. The PHHS project has sought to build more direct market linkages by serving as an honest broker and connecting cooperatives and buyers to opportunities on the demand and supply side.

### **World Food Programme Partnership**

WFP's P4P program was an important alliance for PHHS, linking smallholder farmers to a premium market for better quality maize and beans. With a target purchasing power of around 20,000 metric tons per year, WFP and its partner trading companies offer a significant opportunity for cooperatives that seek a stable buyer for large quantities. Most importantly, WFP is willing to pay a premium for grain that meets their standard, unlocking value at the cooperative level for improvements in post-harvest infrastructure.

WFP was an important leverage point for the PHHS project as it sought to generate a shift in the market toward product and price differentiation. WFP was willing to source from cooperatives benefiting from PHHS trainings and credit facilitation services, which may otherwise have been viewed as too risky or not economically viable for private sector buyers. The WFP contracts also acted as a catalyst for bank financing of cooperatives. In addition to securing a market, credit and higher prices for PHHS-trained cooperatives, the WFP provided training in warehouse management to the cooperatives that it sources from. Perhaps most importantly, private sector buyers like ProDev/Minimex are following WFP's lead and starting to buy from reliable cooperatives that have supplied WFP in prior seasons, pushing WFP to move on to marginal suppliers.

WFP's relationship has been transformational for involved cooperatives. These cooperatives have improved their post-harvest infrastructure, gained access to credit and developed their capacity to supply a differentiated product that captures a premium in the marketplace.

Towards the end of the project, PHHS began working with other buyers interested in paying a premium for quality. The Rwandan Grain and Cereal Corporation (RGCC), which is targeting 20,000-30,000MT per year, has

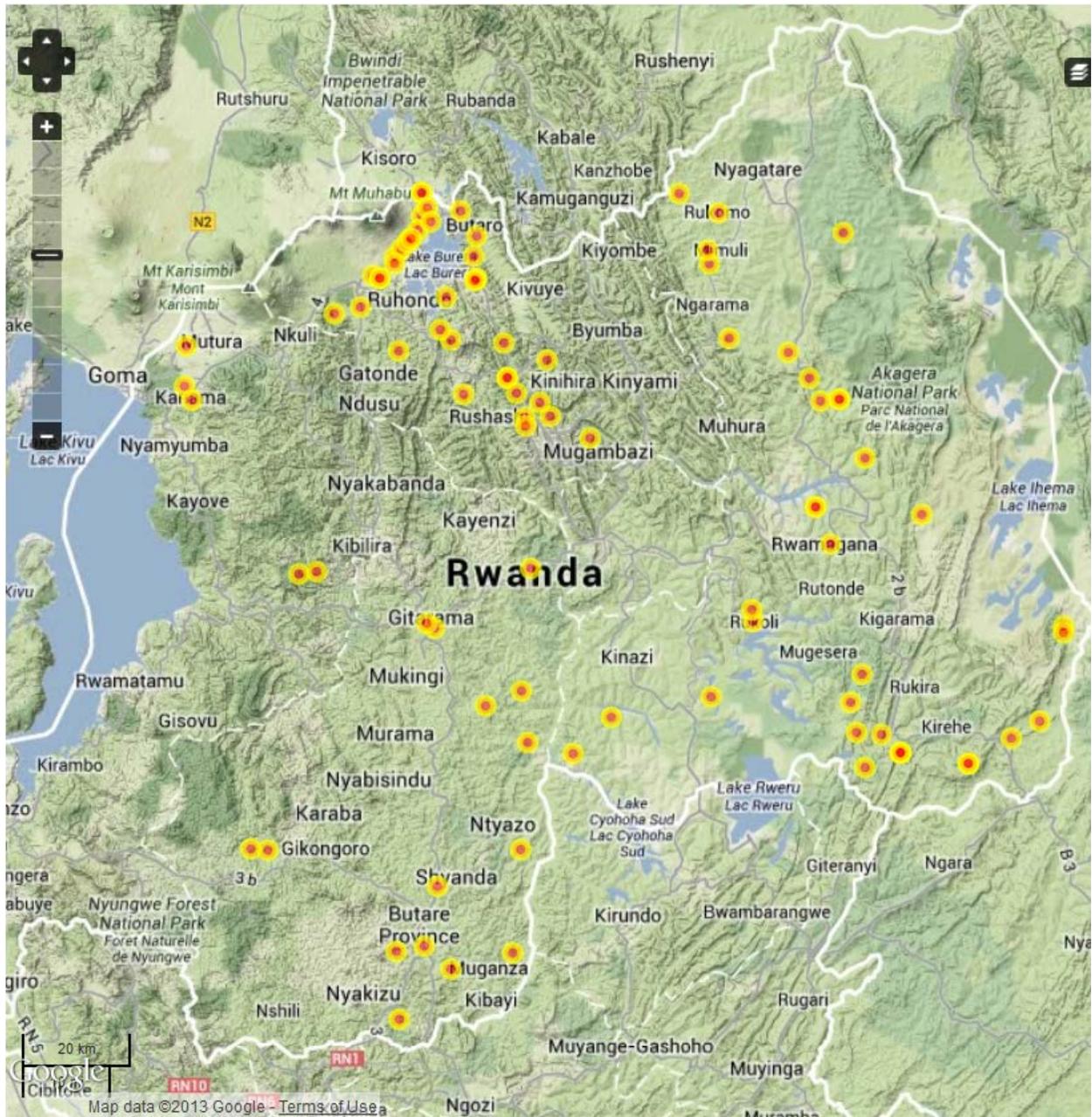
evolved its purchase scheme to mirror the WFP model, offering premium prices for higher quality supplies. Rwanda's Strategic Grain Reserve will also buy according to quality standards.

### **Market Information Systems**

As a way of improving linkages between buyers and producers, PHHS piloted new MIS “e” innovations during the life of the project. PHHS developed a website linked to GPS coordinates of cooperatives supported by the project, and included information on their membership size and the type of product produced. Throughout the project, the business development and communications teams continued to build on the information offered through the PHHS website via discussions with PHHS technical staff and the public/private sector in Rwanda. The PHHS website was used as a virtual business development center and the project has been providing continual updates, including re-verification of GPS coordinates for PHHS-supported cooperatives, redesign of PHHS web pages and development of PHHS Yellow Pages (e-directory) that advertise PHHS stakeholders interested in buying, selling and/or processing beans and maize within Rwanda. These web-based tools have been transferred to the Eastern African Grains Council (EAGC) and the East Africa Commodity Exchange; both organizations are currently building their website content and services.

PHHS also spearheaded the development of an SMS trading pilot system that linked 96 PHHS-trained cooperatives (selling maize and beans) to 53 buyers in Rwanda. Through this platform, buyers are able to share information with cooperatives on quantities demanded and prices, and sellers are able to push information on crops available for purchase. The objective of this pilot system was to address the need for real-time price information on crops, to reduce market information inefficiencies between sellers and buyers, and link PHHS-trained cooperatives with buyers in real time as a way of building on the PHHS GIS tool. One Acre Fund Market Agents are interested in integrating their own cooperatives into the platform, as they have also received quality trainings. Since the project is coming to a close, PHHS is currently transferring this system to the Eastern Africa Grain Council (EAGC).

Figure 1 – GPS coordinates of PHSs-assisted cooperatives.



Through the innovation grants facility, the project worked with a Rwandan, women-run firm—M-Awhiii—to develop a new Market Information System (MIS) model and an SMS based pilot. M-Awhiii designed a survey to assess farmers’ needs, identifying preferred and affordable technologies, and rolled out a plan for its MIS platform. The data collected from the survey informed the design of the roll out plan and the platform is expected to improve access to information and facilitate linkages between farmers,

traders and processors. Following the grant, M-Ahwiii will engage with different actors, register them on the platform, and train them on how to use the system. The grantee is also discussing a partnership with the Rwanda Agricultural Board (RAB) to engage their extension workers. M-Ahwiii's MIS product would provide RAB with an interface to connect extension workers with farmers, and provide virtual assistance and information to supported farmers and cooperatives.

### **Value Chain Analyses and Targeted BDS& Market Linkages Support**

On an ongoing basis, through the work of both the Market Linkages Advisor, and later, the BDC Advisor, the project carried out and facilitated ongoing discussions, buyer visits and workshops with private sector actors in Rwanda and within the region. Project staff traveled to Uganda to facilitate deals with beans buyers, worked with other donor projects in Kenya to link buyers and processors with Rwandan producers, helped organize agricultural fairs and workshops for Rwandan stakeholders, and identified value chain stakeholders interested in investing in PHHS priority sectors.

The project carried out a bean value chain study and as an outcome of this study, developed a list of actors used to identify areas of collaboration in training, market linkages, and market information. This assessment led to a feasibility study of the bean value chain, paying particular attention to bean processing constraints and opportunities. The case study analyzed Rwanda Agribusiness Industries (Rabi Ltd), a company involved in processing and packaging pre-cooked beans. As a result, a training program on beans was developed using the SMFM model.

Additionally, through the grants and post-harvest training activities (described in greater detail in the next two sections), the PHHS project provided ongoing market linkages advisory services to project beneficiaries and business development support to firms applying for grants and bank financing. In total, 59 agri-business firms were supported through direct technical assistance.



### *Transport Study*

A team of CARANA consultants undertook a study of the transport and logistics process in Rwanda to understand how inefficiencies in the transport and logistics sector relate to post-harvest loss rates and the overall costs and competitiveness of the maize and beans value chains. The interviews conducted for the study covered all the relevant actors (producers, distributors, transporters, wholesalers and consumers) along the maize and bean logistics chains, as well as production sites, collection centers, wholesale and retail markets, and selected consumption areas across Rwanda. In combination with stakeholders, PHHS identified interventions for MINAGRI and the private sector to address the most glaring inefficiencies, and generated a list of the highest priority road infrastructure and market logistics investments. The study also looked for business opportunities to facilitate the creation of new public-private partnerships for investment in maize and bean infrastructure, and to improve overall transport and logistics operations in Rwanda.

## MARKET LINKAGES AND BUSINESS DEVELOPMENT IMPACT

**83,676** farmers  
using storage centers  
through PHHS assistance.

Direct assistance to **358**  
private food security  
enterprises and organizations.

BDS support provided to **59**  
**SMEs**, including farmers,



## SUCCESS STORY

# Women farmers increase revenue through trainings

**Working with women farmers to achieve profitable growth addresses their immediate capital needs and promotes empowerment**



(Left to right) Agritesco cooperative members Beata Mutesi, Agnes Karombe, Console Munganyinka, Jamima Mukawiringiye, and Claudine Uwimana. Console is showing a STICKS banner.



(Left to right) Twitezimbere cooperative members Patricie Mukarunziga, Annonciate Musabwamana, and Esperance Kakuze.

PHHS improved the competitiveness of smallholder beans and maize farmers in Rwanda by addressing post-harvest inefficiencies while directly connecting smallholder farmers to formal buyers. In collaboration with the World Food Program’s Purchase for Progress, PHHS implemented Sell More For More (SMFM), a comprehensive capacity-building program to improve the ability of beans and maize cooperatives to meet buyer requirements. SMFM’s Training of Trainers component, was facilitated by STICKS or banners. STICKS records early trainee success in training other cooperative members on post-harvest handling techniques. STICKS were highlighted as an innovative data collection tool at a Feed the Future East Africa Regional Workshop, and SMFM received InterAction’s Best Practices and Innovations Award.

The vast majority of post-harvest activities in Rwanda are managed by women. Therefore, they have a significant role in reducing post-harvest losses. SMFM required at least 50% participation by women; and by the end of September 2012, PHHS had built the capacity of over 22,000 women small-holder farmers. Women farmers in the Agritesco and Twitezimbere cooperatives in the Eastern Province demonstrate the significant gender impact achieved by SMFM. The women emphasized that before SMFM, their post-harvest losses were high and they were affected by seasonal price variations that resulted in low prices at harvest (e.g. spot selling to itinerant traders). Following the SMFM trainings, these women farmers are now able to produce a higher quality product that sells at a premium price. They are also empowered to establish more direct relationships with formal buyers (through their cooperatives). This served as a foundation for building a dry storage unit, providing credit to members and improving market information.

Associate Musabwamana, Twitezimbere cooperative Vice President says, “Before the SMFM trainings, I was not yielding a profit from the crops I was growing; having learned post-harvest handling techniques through the SMFM trainings, I am now harvesting around 300 kilograms of maize [compared to the previous 50 kilograms] and making some profit.” This welcomed profit is freeing up money for investment in Associate’s family’s healthcare, her children’s education, small-scale business investments and personal savings.

In its last months, PHHS introduced and strengthened SMFM by developing the EMPOWER training model which focused on gender. EMPOWER supported women in defining income planning strategies and determining household spending priorities in order to address gender-based inequities in household decision making. EMPOWER will facilitate women farmer’s improved long-term management of their income for years to come.

## Component 2: Investment Finance

Underinvestment in storage infrastructure was identified in the design of the PHHS project as one of the most acute constraints to a more efficient and competitive agricultural sector in Rwanda. This was based on two assumptions: 1) post-harvest losses were high and 2) seasonal price variations resulted in low prices paid to farmers at harvest and high marketing margins for traders. However, an analysis of historical prices did not support the second assumption and it is suspected that initial estimates of post-harvest losses were high. This called into question the value of focusing on construction of large storage units, so the PHHS project expanded its focus to include basic marketing infrastructure for staples, such as equipment for shelling, cleaning, drying and bagging.

One of the most fundamental constraints faced by cooperatives in Rwanda is financing the aggregation of maize and beans from their members. Until this constraint was resolved, the entire system was broken. As a result of investments made in both storage and basis infrastructure, the capacity of cooperatives to aggregate product and meet the requirements of premium buyers increased dramatically. The project also provided support for cooperatives seeking working capital finance to support aggregation of maize from their members.

### Strategic Partnerships through Co-Investment Grants

At the start of the project, in conjunction with the mapping exercise, the PHHS project addressed market linkages constraints by facilitating alliances in order to mobilize investment in post-harvest storage facilities, with the objective of increasing volume of storage. The project partnered with one of the largest grain buyers in Rwanda, ENAS, in order to co-invest in backward linkages with farmers and post-harvest systems. In collaboration with USAID East Africa's Market Linkages Initiative (MLI), the project targeted the middle of the value chain and leveraged MLI grant funds to design grant/investment packages that improved linkages between farmers and buyers. These investments were made in village aggregation centers (VACs), grain bulking centers and post-harvest handling equipment, and cooperative trainings and farmer field days. As a result of the MLI partnership, most market linkage activities in the first year of the project centered around six key grants partnerships; MLI provided the grant funds and management, while PHHS supplemented cost-share grants with technical assistance and field-based grants oversight.

Following the close of the MLI project in September 2011 and due to the success of the initial MLI grants, the PHHS project, upon approval from USAID, realigned its own project budget to facilitate additional grants to cooperatives for storage technology. The project selected an additional 3 cooperatives to receive co-investment grants for storage—Bright Future Cooperative and the COACMU cooperative, both in the Kirehe district, and the INDAKUKI Cooperative in Bugasera. The grant application process included a detailed tendering process led by construction engineers from the project's lead engineering sub-contractor, SOGIS. These additional VAC grants were completed in the first quarter of 2012.

Following the achievements realized by the original grants pilot, the project set aside additional funds in the PHHS extension period for co-investment grants. An additional 10 grantees were selected, representing new geographic locations. Additionally, rather than focus solely on storage grants, the PHHS team solicited proposals for “innovative grants” in order to pilot new business concepts for facilitating investments and improving linkages in the maize and beans value chains.

The PHHS project carried out a cost-benefit analysis of each of the proposed grants. Following this analysis, the project awarded grants to four cooperatives willing to co-invest in village aggregation centers in new Rwandan market locations: a company near the border with the Congo that required silos to increase his capacity to store and trade maize in that region; a company developing a new fortified baby formula product; a local women-run firm piloting an SMS-based market information system; and a regional grain association – EAGC – that was interested in launching a stakeholder forum in Rwanda to improve public-private sector dialogue around grain market issues.

The infrastructure grants supported by PHHS and the MLI project not only improved business performance in the short term, but also increased cooperatives' access to finance. Additionally, the new innovative pilots provided a chance for companies to launch value added processing activities in the project's targeted sectors, thus increasing private sector participation and investment in maize and beans. As a result of these grant activities, throughout the life of the project, 104 storage centers were constructed or rehabilitated and over \$1.6million in new private sector investment was facilitated.

## INVESTMENT FINANCE IMPACT

**\$1.6 M** of new private sector investment in agriculture.

**104** storage centers constructed.

### Merchandizing Credit

Financial institutions in Rwanda are reluctant to invest in the agriculture sector due to the perceived level of risk. Historically, banks in Rwanda have also engaged in traditional collateral-based lending that is difficult for farmers and cooperatives to access. Asset-based lending models that leverage the value of aggregator inventories, accounts receivable, purchase orders, etc., are relatively new. In this environment, it is difficult for cooperatives to mobilize capital for basic infrastructure and purchases of grain from their members.

The PHHS project evolved its finance approach from an initial focus on leveraging investment in storage infrastructure to a focus on credit for cooperatives to support purchase surpluses from their members. This “merchandizing credit” model is enabling cooperatives to successfully fulfill orders from buyers like the WFP and PRODEV/MINIMEX. The merchandizing credit product was developed via a partnership between the PHHS project and Kenya Commercial Bank (KCB), and allows cooperatives to borrow against pending orders to finance the purchase of grain from their members. This asset-based mechanism is new to agricultural lending in Rwanda and has shown promising results.

At the beginning of the project, PHHS staff targeted Microfinance Institutions with an interest in lending to agricultural cooperatives or farmers. However, after identifying various opportunities for commercial bank lending in agriculture, beginning in March 2010, the project began conversations with larger commercial banks to discuss the possibility of financing WFP cooperatives in the Eastern Province. The loan product was developed in conjunction with a technical assistance program for cooperatives in business management to ensure adequate capacity to absorb and manage debt on the borrower side.

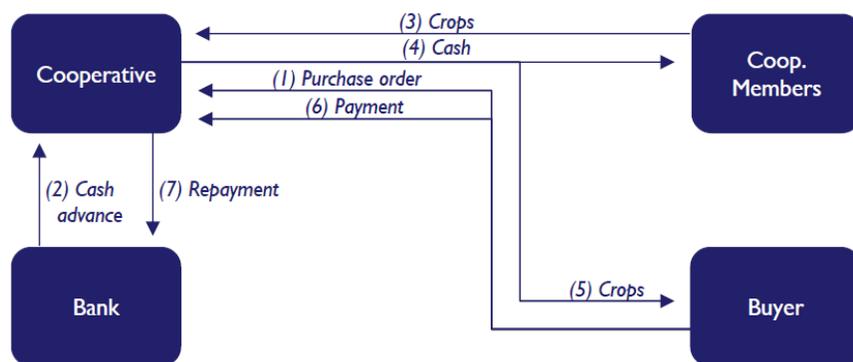
PHHS piloted the merchandizing credit product in early 2011 with a single cooperative, COACMU, which required approximately 150million RWF (over 200,000 USD) in working capital. The issuing bank, Banque

Populaire, agreed to finance RWF 52million (80,000 USD) to fulfill the WFP order. The activity was designed as a test case to assess the banking sector’s capacity and willingness to lend to agribusinesses. The loan was structured as a short term working capital loan revolving on a two month period. PHHS worked with COACMU to provide them with a business plan and technical support.

In the pilot case, the bank required traditional collateral including a provision stipulating that senior members of the cooperative provide details on personal assets. Additionally, the loan was disbursed too late, only arriving after the cooperative finalized its collection. To better understand what caused the late disbursement, PHHS reviewed the procedures required for loan approval and disbursement, concluding that the bank’s paperwork requirements and procedures needed to be streamlined.

With this in mind, PHHS engaged Kenya Commercial Bank (KCB), Banque Populaire and Urwego Opportunity Bank, to develop a more functional model of working capital finance for PHHS partner aggregators supplying WFP. As a result of these discussions, KCB agreed to develop accommodating credit policies for deals backed by WFP purchase orders that did not require fixed collateral. As a result, PHHS helped KCB to provide INDAKUKI cooperative with a 22.5 million RWF loan in August 2011. As a result of the loan, INDAKUKI cooperative was able to supply a 200 MT maize contract to WFP P4P and repaid their loan in full by the end of 2011.

Figure 2 – Merchandizing credit model.



KCB Bank was the most aggressive in terms of its efforts to expand the merchandizing credit program to new cooperatives and buyers. In order to build on this interest to scale up and expand the product, PHHS consultants Bill Wolfe and John Bosco Razabuka analyzed outcomes from the project’s pilot work and provided recommendations on merchandizing credit activities for the extension period of the project, including:

1. There must be a system to stay current on buyer needs, seller stocks and market prices in order to establish new purchase order (PO) contract relationships.
2. Identify other buyers willing to put a premium on quality: RGCC seems to be a promising buyer “candidate” since they are offering producers a premium for quality.
3. Without a focused effort, the inertia of doing things the “old way” via local traders will continue to prevail.

Banque Populaire, although interested in the product and willing to sign a tri-partite agreement with the WFP and the participating cooperative, remained locked into a “traditional” lending structure. They were only willing to provide a 75% advance rate to the cooperative and required significant collateral coverage. Unfortunately, Banque Populaire has continued to have mixed success in lending to cooperatives.

Due to the success of the pilot with KCB, PHHS worked to identify new buyers to target with the merchandizing credit product for Season A 2012. Following meetings with private grain traders to gauge interest in this product, MINIMEX, PRODEV, RGCC and ENAS signed contracts using the same purchase note as the WFP. PHHS also identified additional cooperative suppliers, and supported them in developing business plans and performing financial due diligence in preparation for loan applications. Additionally, the project developed a “package” for the Access to Finance (AFR) Project, in affiliation with MINAGRI, to provide details, tools and direction on how the merchandizing credit product operates.



One of the observations during the project’s analysis of the pilot was that a more hands-on approach to implementing these activities was necessary. Although KCB has been interested in expanding the product, they have yet to fully commit their staff to implement its roll-out. In turn, it is clear that although cooperatives seem to understand the benefits of the product, linkages to private-sector buyers willing to enter into purchase order agreements are still weak. As a result, during the extension period of the project, PHHS piloted a new model for facilitating loans through KCB via a local BDS provider –Synergiadev—who was paid an “incentive” fee equal to 1.5% of the loan value once that loan was approved by the bank. Both KCB and PHHS signed a contract with Synergiadev to work with both cooperatives and buyers to structure purchase orders and vet cooperatives for financing. In the last 3 months of the project, Synergiadev was able to close 4 deals and facilitate \$178,560 in financing.

PHHS has shown that the PO financing concept is viable; however, the expansion will require consistent efforts to create “new habits” on the part of sellers and buyers. One is the use of local intermediaries like Synergiadev. The model has proven sustainable as KCB is engaging Synergiadev’s services directly following the close of the project. As a result of PHHS’ work in piloting the merchandizing credit product, \$628,868 USD in loans were provided to Rwandan cooperatives



### Component 3: Post-Harvest Management

Most farmers lack knowledge of or access to information on appropriate post-harvest handling practices. Some farmers join farmer organizations to aggregate product and to find better markets. Unfortunately, many farmer organizations are poorly managed and the members themselves are unable to produce quality products that meet the specifications of better paying buyers. Farmer organizations also struggle to find relevant technical and business support and local organizations (private support firms and government agencies) lack the ability to provide effective training and

technical assistance. As a result, under the post-harvest management component, the PHHS project focused largely on rolling out a comprehensive capacity-building program targeting maize and bean cooperatives in the Eastern and Southern provinces through a Training of Trainer (ToT) model. The training included two major components: 1) training on post-harvest handling and storage techniques; and 2) assessing the effectiveness of the training. The project also developed a training curriculum for cooperative leaders that features four modules on leadership, marketing, record keeping, and action planning.

Anchoring the training program in the relationship with WFP served as a catalyst for adoption of practices introduced during the training. As cooperatives improved their capacity to meet the requirements of more sophisticated buyers, this gave them negotiating power and allowed for diversification beyond the initial anchor buyer. The project has supported this diversification, with cooperatives initially supplying WFP moving on to supply commercial buyers. The powerful combination of well-designed training and a sustainable market linkage made this possible.

### **Post-Harvest Management Training/Sell More For More**

The World Food Programme's (WFP) Purchase for Progress (P4P) initiative was officially launched in Rwanda in April 2010. With the introduction of a premium-paying buyer into the Rwandan market, the PHHS project capitalized on the new demand for higher quality products by partnering with them to address supply side constraints. The WFP approached PHHS to help them select cooperatives and design a training that would improve cooperative capacity to supply a premium product that would meet WFP standards. WFP was willing to pay a premium price to cooperatives meeting those standards.

Following initial discussions, PHHS and WFP P4P selected 25 cooperatives from two regions that had the potential to meet the criteria of providing maize and beans to the program. PHHS and WFP assessed the cooperatives for any previous or ongoing training from other agencies so that there was no duplication of training. PHHS developed a training pilot by working through district agronomists employed by the Ministry of Agriculture. However, after evaluating the extent and quality of onward training of farmers and cooperatives, the project changed directions to focus on a lead farmer ToT model.

As a result, in the latter part of 2010, PHHS developed and launched a joint WFP P4P training program, Sell More for More, to improve cooperatives' capacity to meet WFP requirements in maize. The training program consists of six modules: leadership, marketing, business planning, record-keeping,

post-harvest handling and warehouse management. The ToT component is facilitated by “sticks” banners that provide a visual of good post-harvest management practices and allow the trainer to record the number of farmers trained. The maize trainings were carried out throughout the 2011 calendar year.

During the extension period of the project, the Natural Resources Institute was engaged to implement a needs assessment for beans and develop a training report on areas of required technical assistance and capacity building. This was done alongside PHHS local partner WEACS, who then worked with PHHS to develop a training program based on the needs identified. In the final year of the project (2012-2013), new post-harvest management trainings were targeted toward bean cooperatives, focusing again on meeting WFP quality standards.

Based on recent assessments by the project, cooperatives supported with the training and grants for appropriate post-harvest technology were able to reduce their losses from an estimated 35-40% to less than 5%. Additionally, because the training required at least 50% participation by women, significant gender impact was achieved. This is especially important because the vast majority of post-harvest activities are managed by women, so they have a significant role in reducing post-harvest losses



### Cooperative Leadership Training

The project also developed a training curriculum for cooperative leaders that relies on Leadership Kits. A Leadership Kit is composed of four modules: Leadership, Management, Records, and Operations. Each module is a three-day workshop that is delivered by a local firm—AFFICCO—to

the current and emerging leaders of the cooperative (approximately 15 people). The workshops are conducted with two cooperatives together (30 people total) to facilitate sharing of experiences and to encourage future collaboration.

All workshops followed a 5/25 design: for every 5 minutes of formal presentation by the facilitator there must be 25 minutes of activities, small group discussions or peer dialogues. All participants were also issued Planning Books in which they capture ideas and action items for their cooperative. The output of the first two modules is a Marketing Plan; the output of the second two modules is a Business Plan.

Different cooperatives that have participated in trainings together are now working together to share resources, including storage infrastructure. The project has also seen improvements in understanding how to write and manage contracts and some cooperatives have started demanding that new contracts be drawn up in Kinyarwanda instead of English. Related to this, cooperatives are reaching out to traders and buyers much more frequently to receive price information before negotiating contracts.



### **BDS Partnerships**

One unique feature of the Sell More for More training program was that training activities were implemented through two local training providers -- WEACS and AFFICO—while the WFP trained cooperatives in warehouse management. Using local partners improved the sustainability of the training program, as Rwanda now has two local service providers that are

capable of implementing post-harvest management and cooperative management trainings without the technical guidance of an international contractor. The local service providers have also been successful in developing a training approach and strategy that marries international best practice with local practice and context.

The engagement of WEACS and AFFICO provides a solid foundation for a future service industry supporting agribusiness, but that industry is not yet commercially viable. Competition from donor and government-subsidized programs supporting agriculture is such that cooperatives and agro-processors aiming to improve supply chain efficiencies do not generally need to procure these services from commercial providers. However, WEACS and AFFICO have been successful in securing sub-contracts from other donor organizations, thus creating a market for local service provision in line with USAID Forward priorities.

As a result of the SMFM program, over 60,000 people have been trained. Retention and application of skills has also been noticeable. Following a 2012 assessment of the SMFM program, 87% of trained farmers were applying best practices in post-harvest management compared to 46% before trainings occurred. This has resulted in increased income for 93% of those surveyed, better quality products for 91% and higher prices received among 77% of trainees.

## POST-HARVEST MANAGEMENT IMPACT

New technologies applied  
by **43,455** farmers.

**60,085** famers trained in post-  
harvest handling and storage best  
practices.





## SUCCESS STORY

### *Sell More for More* trainings empower local farmers

#### **Maize cooperative leaders receive training in post-harvest handling, storage, and management.**



Farmers from two different cooperatives in the Eastern Province of Rwanda work together in small groups to brainstorm new ideas for increasing the quality and productivity of their crops. Rwandan trainers facilitated the leadership session, the first of seven modules that provide technical and business practices to lead farmers.

*“I was particularly pleased with the cooperative leadership development we completed. I am optimistic to see that from these workshops the cooperatives are going to increase production and sales.”*

Evariste Kaberuka, President,  
Ibyizabiri Mbere Cooperative

With high-crop losses estimated between 30-40%, it is imperative for farmers in Rwanda to learn proper storage and handling techniques for their crops. *Sell More For More* trainings are part of USAID’s Post-Harvest Handling & Storage (PHHS) project, in partnership with the World Food Program’s Purchases for Progress (P4P) program. These trainings provide technical and business practices in post-harvest handling, storage and management to the leadership of 24 maize cooperatives.

A kick-off training for the Eastern Province of Rwanda was held on 17 January for 30 farm leaders of the Ibyizabirimbere and Terimberemuhinzi cooperatives. Lead farmers attend the six-week training and then pay it forward by committing to train the remaining farmers in their cooperatives.

The majority of farming cooperatives in Rwanda are less than five years old. Many only have volunteer boards and few paid staff. Making the leap from getting organized to actually making money is significant. These trainings give farmers the necessary tools and technical expertise needed to lead their growing members.

The trainings pair up cooperatives—bringing farmers together who might never have the opportunity to learn from one another in such an intentional setting. “This learning between cooperatives is powerful,” says John Leary, Senior Technical Assistance Director for PHHS. “Participants have a sense of ownership over the process.”

Dennis Weller, Mission Director for USAID Rwanda, attended the kick-off celebration. “I was struck by the eagerness of the farm leaders to apply business principles to farming. Farmers and cooperatives are working together to better dry and store their crops; this training of lead farmers—men and women—is a good demonstration of how the U.S. is working under the Feed the Future initiative to accomplish greater food security,” Weller said.



## Public Sector Strategy

The PHHS project worked closely with the government of Rwanda to prioritize project objectives and activities that were strategic for the Ministry of Agriculture (MINAGRI) and to improve the enabling environment and government support for commercial marketing of staples. Additionally, the project's knowledge of the private sector and lessons of the ground were used to inform policy decisions.

PHHS implemented several initiatives aimed at supporting the government of Rwanda's policy framework and programs targeted at grains sector. The project supported MINAGRI to:

- Develop a National Post-Harvest Staple Crop Policy;
- Improve data/evidence driven policy by building the capacity of government stakeholders to monitor, utilize and manage postharvest loss information through improvements in data collection;
- Develop a detailed strategy for the government Market Information System – ESOKO; and
- Design a Strategic Grain Reserves Manual to assist the government in managing their strategic grain stocks.

Furthermore, the project has made an effort to improve information flow between public and private sector by working with MINAGRI in an advisory role and supporting Rwandan civil society to facilitate public-private dialogue between value chain actors.

### Component 4: Post-Harvest Strategy Development

In the first year of the project, USAID engaged the PHHS project to assist Rwanda's Ministry of Agriculture (MINAGRI) in developing a National Post-Harvest Staple Crop Policy to address issues related to increasing production, including post-harvest losses due to poor handling, and lack of storage and processing infrastructure. Under this component, the PHHS project finalized a report and action plan providing evidence-based

examples, policy guidelines and suggestions for interventions by MINAGRI in order to encourage private sector driven approaches to addressing post-harvest losses. Specific recommendations included improving efficiency of transport systems between production and secondary aggregation points, and leveraging the Rwanda Strategic Grain Reserve's buying power to support marginal, but viable markets that would benefit from road improvements.

Following the assessment, three project consultants specializing in agribusiness, policy and budgeting developed a budgeted implementation strategy for the Post-Harvest Policy and presented it at several public-private sector workshops. Following this consultancy, the PHHS team decided it would be necessary to hire a full-time, dedicated policy advisor to oversee the passage of the strategy within Parliament. With the support of the full-time advisor, the PHHS team assisted MINAGRI to develop a strategy to address the development of a strong Rwandan post-harvest sector and complement GORs plans for a strategic grain reserve system.

The post-harvest strategy was approved by the Inter-Ministerial Coordination Committee and formally passed by the Cabinet in December 2011. It should be noted that due to the large number of policy papers and the complexity and difficulty of getting them accepted by Rwandan Government, very few policy papers are actually passed. This relatively swift passage should be seen as a success, but only an initial step toward a comprehensive approach by the government to developing the post-harvest sector. Following passage of the policy, PHHS continued to support MINAGRI in its implementation of the strategy.

### **MINAGRI Advisory Support**

The PHHS project also supported the Ministry of Agriculture in developing its policy planning capacity, shifting to a more accurate approach for assessing what future surpluses will be and how the government can respond in ways that maximize the volume of surpluses reaching the market. The Ministry of Agriculture-led Post Harvest Task Force is the central mechanism for inter-agency planning, with individual agencies and Ministries responsible for different aspects of strategy implementation.

The PHHS Policy Advisor provided support to the Task Force and advised the government on areas such as the creation of a national grains and cereals corporation, a national commodities exchange, and a national strategic reserves policy. During the extension period, the policy advisor served as an embedded advisor within MINAGRI to increase the advisory services provided to the government.

Among the initiatives resulting from the project's advisory role, PHHS partnered with MINAGRI to improve on-farm storage through the use of hermetic bags. 953 agro-dealers and 563 lead farmers were trained in May 2013 in the use of two different airtight bags. A national hermetic bag opening day was held in June 2013, the purpose of which was to show farmers and traders the impact that the hermetic bags have on controlling insect infestation and maintaining stable moisture levels in grain. The Policy Advisor, as co-chair of the MINAGRI ICT Committee, also contributed to a pilot to develop a fertilizer voucher scheme via a mobile Visa money platform link agro-dealers, government subsidy payments, and government purchases for the state reserve. The PHHS policy advisor also contributed to the Grow Africa Initiative proposals for Rwanda in order to attract outside investment in strategic agricultural sectors.

### **Post-Harvest Loss Assessment**

In the first quarter of 2011, PHHS began working with the MINAGRI Post-Harvest Task Force to develop a suitable approach to the estimation of post-harvest losses. An initial focus on maize and rice was prioritized and the PHHS project engaged the Natural Resources Institute (NRI) to use the *African Post Harvest Losses Information System (APHLIS)* system in determining postharvest losses in 2011. NRI consultants, in collaboration with PHHS, trained MINAGRI data collectors in how to administer the APHLIS survey instrument as part of a comprehensive system for Rwanda to monitor key factors affecting postharvest losses. The PHHS team also field tested the postharvest survey questionnaire with the MINAGRI data collectors, developed a user friendly spreadsheet for entry of the postharvest survey data, trained the MINAGRI data entry team on its use, and assisted the survey team in planning the 2011 Season A postharvest survey.

NRI returned to Rwanda following the survey of losses for Season A 2011 to analyze the figures and work with MINAGRI on data analysis. As a result, NRI developed postharvest loss figures for Season A and presented these findings to MINAGRI. PHHS also adapted and improved the Season A questionnaire for Season B 2011 in order for MINAGRI data collectors to carry out further loss research and input data into the APHLIS system.

Following the initial assessments in 2011, PHHS responded to MINAGRI's request to support their survey efforts for Season A 2012 through technical assistance and financial support to MINAGRI's enumerators. The project saw this development as a positive step forward since it showed that MINAGRI had taken ownership of this survey.

As a result of concerns that the APHLIS system was not predicting Rwandan losses accurately enough, PHHS helped the GoR analyze other

models. The APHLIS model relies on secondary data to provide coefficients for post-harvest loss data. Therefore, the aim of a new tool was to include more Rwanda-specific coefficients.

Beginning in the third quarter of 2012, the PHHS project housed a Fulbright Scholar from Purdue University, Mike Jones, specializing in storage and postharvest management. Mr. Jones coordinated post-harvest loss assessment activities with the Postharvest Task Force and RAB and worked with MINAGRI and PHHS to develop an economic and physical post-harvest loss model for beans and maize. This economic tool measures economic losses due to reduced quality and has the potential to help government and private sector make informed decisions about which postharvest inputs are economically effective.

A national survey was administered from October 9-17, 2012, which gathered cross-sectional data on farmer's losses from harvest to end use. Extension agents were trained to use physical "visual scale" samples of damaged grain in data collection. In this way, farmers could identify quality of grain throughout the marketing season and more precisely estimate losses. The data, overall, came close to the APHLIS-generated figures. Following the October assessment, Mr. Jones led a team of three MINAGRI enumerators (conducting surveys in 22 national rural markets in Rwanda) to quantify price discounts resulting from insect-damaged beans and maize. The survey appraised actual grain samples with 0%, 5%, 10%, 20%, and 30% insect damaged grain.

Mr. Jones and the MINAGRI enumerators followed up with another assessment for Season A 2013. Compared to the Season A 2012 assessment, which occurred 4-5 months after harvest, results for Season A – carried out 1-2 months after harvest—indicated a logical increase in traders' discounts for lightly damaged grain earlier in the season, and nearly ubiquitous rejection of heavily damaged grain. The national average discount per hole in 100 grains increased 69.4% between survey periods, from 0.36% at the end of Season B to 0.61% at the beginning of Season A.

When compared to Season A, Season B showed a 67.3% increase in discounts per 1% grain damage between survey periods. Rejection rates increased dramatically, even for 10% damaged grains. The economic analysis was able to demonstrate that postharvest losses result in a significant decrease in what the market is willing to pay, and thus indicates a trend towards price differentiation based on quality. The survey also showed farmers the economic returns that are possible from improved postharvest handling and storage.

The PHHS team also trained enumerators to physically measure losses at the harvesting and drying phases. Next season, following the close of the

PHHS project, they will measure shelling and transport losses. MINAGRI staff is now fully trained on post-harvest loss estimation and have started estimating maize losses on their own; beans and rice will follow. MINAGRI has committed to managing the post-harvest loss assessments based on the methodology developed by the PHHS project.

Although the project was not able to measure changes in postharvest losses during the period of the project, the maize assessment carried out in 2012-2013 was able to show a 3.79% decrease in physical losses among farmers who were trained in postharvest management. Additionally, the activity was successful in developing a post-harvest loss monitoring system and building the capacity of the Rwandan government to continue reporting loss trends in the future. This will be critical for the government to monitor changes in losses over time, and contribute to data-driven policy decisions. PHHS has given the Rwandan government the tools to manage a robust system for data collection and analysis beyond the life of PHHS, and use that information to direct government resources toward market constraints. Results from the survey can be found in Annex II.

### **Esoko Assessment and Strategy**

In 2012 and early 2013, PHHS carried out an e-Soko strategy assessment in partnership with MINAGRI and FAO. The team also worked closely with the FAO and MINAGRI to develop a detailed action plan, which laid out a five-year road map for the development of an “e-Soko 2.0 Patch” and “e-Soko +”. The Strategic Plan identified constraints within the current platform and provided a strategy and budget for the e-Soko 2.0 Patch and e-Soko + strategies. The strategy takes into account both private and public sector interests and ways of getting necessary private sector buy-in, including the eventual privatization of the system’s operation. The Strategic Plan was presented to MINAGRI in January 2013 and following some revisions was formally submitted to MINAGRI in May 2013. MINAGRI had asked for strategies and budget implications associated with implementing a market information system, a market-based trading platform and an electronic extension system. This, plus a detailed work plan and terms of reference were provided. Budget constraints, however, may mean that a less ambitious system will result.

### **Advocacy Platform**

PHHS facilitated a Rwanda Grain Stakeholder Forum held on May 28<sup>th</sup>, 2013. The Forum was led by the Eastern Africa Grain Council (EAGC) and brought together 37 participants from the grain value chain private sector (including traders, processors, millers and warehouse operators),

government representatives from MINAGRI and the Rwanda Agricultural Board (RAB), development partners, and cooperatives.

The goal of the workshop was threefold:

- Identify and create an avenue for joint policy and advocacy dialogue between the private and public sector in Rwanda.
- Create a structured platform to facilitate private sector participation and engagement through EAGC's Rwanda Chapter.
- Prioritize EAGC program delivery to Rwandan grain stakeholders

The Forum brought together grain and cereals stakeholders to discuss and debate challenges and opportunities in their sector. It also launched EAGC's presence in Rwanda following the establishment of a satellite office within the PHHS project office. The forum introduced the EAGC's role and capacities in developing partnerships and platforms among grains stakeholders, and leading advocacy activities that contribute to growth of the grains sector, both at the national and regional level. As a result of the event, EAGC added the Rwanda East Africa Commodity Exchange, the Rwanda Development Organization, and the RGCC as members. Feedback from the forum also provided the EAGC with a road map on how to improve its Rwanda chapter and best represent private stakeholders.

### Strategic Grain Reserves Manual

PHHS mobilized a consultant to work with MINAGRI in designing the Operations and Procedures Manual in the final month of the project. The NSGR manual, developed in conjunction with MINAGRI's Post-Harvest Task Force, will be a guide for the government to address potential shocks to food supply that the market or other government programs cannot or have not adequately addressed in the past. The principal objective of NSGR is to improve food security, while simultaneously avoiding market distortions to the greatest extent possible. It will be a tool used to guide timely response to food emergencies. MINAGRI also requested that PHHS provide guidance on utilization of the NSGR as a price support mechanism that would benefit farmers. The final report was submitted to MINAGRI in September 2013.





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# Annex I: Performance Monitoring Plan (PMP)

		Year 1: Oct 2009-Sept 2010			Year 2: Oct 2010 - Sept 2011			Year 3: Oct 2011 - Sept 2012			Year 4: Oct 2012 - June 2013			Totals for Life of project to date		
PERFORMANCE INDICATORS	Unit	Target	Results	Results vs. target	Target	Result	Results vs. target	Target	Result	Results vs. target %	Target	Result	Results vs. target %	ORIGINAL PROJECT TARGETS	NEW LIFE OF PROJECT OVERALL TARGETS	LIFE OF PROJECT RESULTS TODATE
<b>Key Result Indicator for all components</b>																
Custom: Commodities entering USAID-supported storage.	MT	5,000	0	0%	19,000	18,665	98%	10,000	19,463	195%	10,000	6,815	68%	34,000	44,000	44,943
<b>COMPONENT ONE - MARKET LINKAGES</b>																
Custom: Farmers using storage/conditioning/processing centers with PHHS assistance*	# Men	18,000	0	0%	12,000	30,399	253%	22,000	28,441	129%	3,000	16,832	561%	50,000	58,000	83,676
	#Women										3,000	8,004	267%			
FtF 4.5.2-11 Number of food security private enterprises, producer organisations, water users associations, women's groups, trade and business organisations, and CBOs receiving direct assistance	Number	50	59	118%	10	84	840%	41	23	56%	107	192	179%	88	208	358
<b>COMPONENT TWO - INVESTMENT FINANCE</b>																
Custom: Grants awarded to cooperatives/businesses for new equipment or infrastructure	Number	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	N/A	10	9	90%	N/A	15	14
FtF 4.5.2-38 Value of new private sector investment in agriculture in the agric sector or food chain leveraged by FTF implementation	US\$	\$50,000	\$387,000	774%	\$450,000	\$595,312	132%	\$965,000	\$600,000	62%	\$85,000	\$178,560	210%	\$1,450,000	\$1,550,000	\$1,760,872
Custom: Storage/conditioning/processing centers constructed/purchased with project assistance	Number	100	0	0%	100	93	93%	50	7	14%	0	4	100%	250	250	104
FtF 4.5.2-37 Number of MSMEs, including farmers, receiving business dev't services from USG-assisted sources	Number	2	3	150%	13	39	300%	5	3	60%	10	14	140%	16	30	59
FtF 4.5.2-30 Number of MSMEs including farmers receiving USG assistance to access bank loans	Number	6	6	100%	6	8	133%	11	10	91%	16	19	119%	18	39	43
Custom: Firms receiving assistance to invest in improved technologies	Number	1	2	200%	37	35	95%	2	0	0%	2	2	100%	40	42	39

		Year 1: Oct 2009-Sept 2010			Year 2: Oct 2010 - Sept 2011			Year 3: Oct 2011 - Sept 2012			Year 4: Oct 2012 - June 2013			Totals for Life of project todate		
PERFORMANCE INDICATORS	Unit	Target	Results	Results vs. target	Target	Result	Results vs. target	Target	Result	Results vs. target %	Target	Result	Results vs. target %	ORIGINAL PROJECT TARGETS	NEW LIFE OF PROJECT OVERALL TARGETS	LIFE OF PROJECT RESULTS TODATE
<b>COMPONENT THREE - POST HARVEST MANAGEMENT</b>																
Custom: Decrease in post-harvest food losses in project sites**	% (Maize)	5%	N/A	N/A	5%	N/A	N/A	5%	N/A	N/A	4%	4%	TBD	15%	19%	4.00%
	% (Beans)										3%	N/A	TBD		3%	N/A
FtF 4.5.2-7 Number of individuals who have received USG supported short-term agricultural sector productivity of food security training***	# Men	11,000	91	1%	9,000	24,359	271%	19,000	26,463	139%	8,250	4,645	56%	34,000	54,000	60,085
	# Women										6,750	4,527	67%			
FtF 4.5.2-5 Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	# Men	11,000	0	0%	11,000	22,522	205%	6,650	6,323	95%	9,350	7,872	84%	44,000	45,650	43,455
	# Women										7,650	6,738	88%			
FtF 4.5.2-13 Number of rural households benefiting directly from USG assistance	Number	18,000	0	0%	12,000	24,450	204%	19,000	26,042	137%	13,439	8,217	61%	50,000	62,439	58,709
<b>COMPONENT FOUR - POST HARVERST POLICY</b>																
FtF 4.5.1-24 Number of policies/regulations/administrative/studies/ procedures drafted and presented for public stakeholder consultations as a result of USG assistance	Number	0	0	100%	1	1	100%	0	0	100%	3	3	100%	1	4	4
Custom: Public-private sector dialogues utilized as a result of PHHS assistance	Number	4	13	325%	4	18	450%	12	13	108%	30	29	97%	10	50	73
Note that Indicators 4.5.2-7 and 4.5.1-24 targets have been adjusted																

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